

Floating Islands

An Activity Book



Richard J. Heggen

DRAFT 3/30/2018

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PROLOG

An undated "Notes & Queries: Speculative Science," guardian.co.uk webpage poses a question from Dorothy Finan, Haworth, UK:

Does the land underneath an island go all the way down? Could I swim underneath an island? What creatures could live in the gap between the bottom of the island and the sea-bed?

Twenty readers responded.

Islands don't float	10
Ships float	2, Archimedes' Law, though not identifying it as such
Icebergs float	2
Pumice floats	1
Examples of floating islands	3, citing Buckeye Lake, Ohio, Lake Ralagen, Sweden, Lake Titicaca, Peru and the Wikipedia website list of 14
Lament	1, regarding the teaching of geography in Britain 1, regarding the above responses

The majority found the question to be silly. A smaller group identified floating objects that might or might not be considered to be "islands." A yet-smaller group was aware of naturally floating islands.

Ms. Finan's question is a good one.

This work is a sequel to Underground Rivers, From the River Styx to the Rio Buenaventura with Occasional Diversions, a document of some 1500 pages available for download free of charge at <http://www.unm.edu/~rheggen/UndergroundRivers.htm>. Underground Rivers is broad in content, pursuing the thesis "Underground rivers are everywhere" into history, science, literature, the fine arts, popular culture, even postage stamp collecting, and that's but a portion of the realms.

Underground Rivers includes a degree of overview. Discussion of the Arabic contribution to the subject, for example, includes general discussion of how Islamic scholarship helped preserve Greek writings. As different readers have different basic knowledge, it's better to err in favor of the novice. Where I've delved into overlapping background material in Underground Rivers, I've cut back repetition here.

The reward is recognizing how thoughts wander between what we might presume to be disparate areas of study. Underground rivers are everywhere, but more than that, they incessantly intermingle.

The topics of floating islands and underground rivers juxtapose with near-perfect-symmetry, each connoting something that sounds somewhat geological, but claiming a vertical relationship contrary to our expectations. Rivers flow on the ground, not under it. Islands rest upon the bed of a waterbody, not the water itself.

A pair of citations, the topics bearing no anthropological commonality, illustrate what seems to be a trans-cultural perceptual linkage between underground rivers and floating islands. The first comes from "Extracts from the Journal of Thomas Dineley, Esquire, Giving Some Account of His Visit to Ireland in the Reign of Charles II," 1681, Journal of the Kilkenny and South-East of Ireland Archaeological Society, 1856, by Evelyn Shirley.

The nature of the land is such that it trembles in several places, and seems as if it swom upon ye waters, and that this kingdom were a floating island.

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Footnoted by John Prendergast,

This may allude to the bogs, or to the cavernous nature of the limestone rock, which causes in parts of Gahvay, Clare, and Mayo, the rivers in some parts to disappear, and take a subterraneous course, and to turloughs or swallow-holes, where the waters, coming up from below, occasionally rise and swell.

The second is "Some Aspects of Pueblo Indian Religion," Harvard Theological Review 34:1. January 1941, by William Robbins.

Zuni cosmology is very fragmentary. The earth is circular, and is surrounded on all sides with water, -- a kind of floating island. The supporting ocean is connected by underground channels with the lakes and streams in the Pueblo territory, which thus become something more than mere collecting places of surface water.

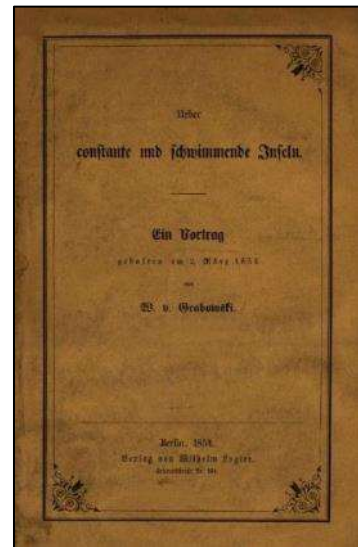
Seemingly-unrelated papers reveal a perceptual tie between subterranean streams and floating isles, two visions residing in adjacent cubbyholes of our imagination. Moving from one to the other is organic.

This venture would have crept at snail's pace but for Chet Van Duzer's Floating Islands: A Global Bibliography (2004), a tour-de-force in bibliographic cataloging. Van Duzer's format is largely one of alphabetical order, efficient for cross-referencing, less efficient for thematic narrative. Conceptual drafts of many chapters that follow began with cut-and-pastings from Van Duzer's volume.

Endeavoring to encompass the study of floating islands in a single volume, W. Grabowsk, discusses icebergs, the legend of Delos, Dal Lake in India and the Sargasso Sea in Ueber Constante und Schwimmende Inseln (About Constant and Floating Islands, 1854).

Our goal, admittedly audacious, but so much fun to carry on, is the same.

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INTRODUCTION

From a small-town newspaper of a bygone era,

The Athens Messenger
 ATHENS, OHIO, THURSDAY, JULY 11, 1929

DAILY MAGAZINE PAGE FOR EVERYBODY

Floating Island + + by Madge Geyer



Our definition of "floating island" - the one with which we are most familiar - is the delicious, frothy dessert that one simply cannot resist. Then there are the bits of land which detach themselves from the mainland and float aimlessly off and away until they happen to strike some other land and attach themselves there. And both these definitions are in my mind as I tell you the story of the "floating island" pictured here. Always seeking a thrill, these two

wee floating island and have perched thereon and are floating along with it, waiting to see what will happen. And they look as delicious as the desert we love. And they'll float along until they find the adventure they seek and find someone or some two to rescue them and then -- well, like the island, they will attach themselves to the Beloved and no more floating island! They'll be part of the mainland of Love and Happiness.

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Introduction

"Float along until they find the adventure they seek and find someone or some two to rescue them" is what our girls might do, but what might we do with such an island? We'd like an activity list.

Our query regarding what to do with a floating island will be flavored with geology, biology, even a bit of physics, but like our two floating flappers, we'll look for adventure as well.

For our purposes, "floating islands" are buoyant bodies surrounded by water, capable of supporting the weight of a human.

"Surrounded by water" can be in the past, e.g. a formation that's drifted and affixed itself to bank, or in the future, e.g. littoral vegetation the may break free of the shore.

"Capable of supporting the weight of a human," perhaps unduly anthropocentric, provides a qualitative notion of magnitude. The criteria is utilized widely, the citations below being examples.

Alberta	F.J. Lewis, E.S. Dowding and E.H. Moss, "The Vegetation of Alberta: II, The Swamp, Moor and Bog Forest Vegetation of Central Alberta," <u>Journal of Ecology</u> 16 (1928)
Wales, Interior Alaska	C.N. French and P.D. Moore, "Deforestation, Cannabis Cultivation and Schwingmoor Formation at Cors Llyn (Lynn Mire), Central Wales. <u>New Phytologist</u> 102 (1986)
Uganda	W.J. Eggeling, "The Vegetation of Namanve Swamp, Uganda." <u>Journal of Ecology</u> 23:2 (1935)
Louisiana	C.M. Swarzenski, E.M. Swenson, C.E. Sasser and J.G. Gosselink, "Marsh Mat Flotation in the Louisiana Delta Plain", <u>Journal of Ecology</u> 79 (1991)
Lake Victoria,	F. Kansime, M.J. Saunders and S.A. Loiselle, "Functioning and Dynamics of Wetland Vegetation in Lake Victoria: an Overview," <u>Wetlands Ecology and Management</u> (2007)
Australia	R. Hill, G.J.W. Webb and A.M.A Smith, "Floating Vegetation Mats on a Floodplain Billabong in the Northern Territory of Australia," <u>Hydrobiologia</u> 150 (1987)
Tasmania.	P.A. Tyler, "Lagoon of Islands, Tasmania -- Death Knell for a Unique Ecosystem?" <u>Biological Conservation</u> 9:1 (1976)
Hawaii, supporting the weight of grazing cattle Mississippi Delta, supporting the weight of large animals	C.E. Sasser, M.D. Materne, J.M. Visser, G.O. Holm and E. Evers, "Restoring Freshwater Floating Marsh in Coastal Louisiana," <u>Louisiana Agriculture</u> 50:2 (2007)

As it's well to be aware of phenomena somewhat beyond our criteria, however, we'll have a bit to say about such less-substantial flotants as lily pads, surface-tension-supported sand grains, and the like.

We'll include islands that once floated, though they may not at present, and we'll make note of islands that do not float in a physical sense, but by seeming to move, convey the impression that they might be floating.

Floating islands can be of artificial or natural origin, the latter including,

1. Pumice islands.
2. Icebergs.
3. Biogenic features i.e., those having botanical genesis. Here's where we'll concentrate.

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The clipping's floating island "with which we are most familiar" may be in fact unfamiliar those who watch their weight, but as desert should follow dinner, we'll delay that type of island until our final chapter.

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CHAPTER 1

CONSULT THE CLASSICS

Ancient mythology reflects what was once believed to be real. Great tempests, hideous monsters and distant kingdoms of untold riches were as real to Egyptians, Greeks and Romans as atoms and supernovas are to us today. That floating islands are an element of classic mythology tells us that the Ancients believed such islands to exist.

As reflected by Arthur Bernard Cook in "Appendix P. Floating Islands," Zeus, A Study in Ancient Religion 3:2 (1940),

It will be obvious from a survey of the foregoing passages that floating islands as such made a deep impression on Greeks and Romans alike and were almost always regarded with naive feelings of awe and veneration. Such phenomena attached themselves readily to the cult of the local deity, often a lake-goddess.

Alan Lloyd says it succinctly in Herodotus, Book II: Commentary (1976),

It is worth noting that classical writers had something of a predilection for floating islands

We can, in fact, identify sites that might have fueled the lore of floating islands. To the right are some surmised locations.

- Ambrosiai Petrai
- Aeolus
- Delos
- Strophades
- Symplegades
- Chemnis



We'll visit the six floating islands, beginning in Egypt and ending with the one most difficult to locate. We'll then note the thematic continuity of a floating-island world view with the underpinnings of modern religious traditions.

A note regarding geographic locations: As will be apparent, elements of one myth may re-present themselves in another. Myths can merge. Myth can subdivide, two tellings morphing into divergent stories. Our associations of story with location are drawn from current scholarship, but time has muddled the tales beyond any certainty of geographic correspondence.

Chemnis (sometimes spelled Chemmis)

No Egyptian source speaks of Chemnis, an isle now known as Akhmimin the Nilotic delta, as floating. It is a Greek, Herodotus (c. 484-425 BC), who provides the first report of that attribute in his Histories,

The next greatest marvel is the island called Chemnis. This lies in a deep, wide lake near the temple at Buto, and the Egyptians say that it floats. I myself never saw it float or move at all, and I was astonished to hear that an island could really float.

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Herodotus, however, deemed the claim to be but myth.

This is the story the Egyptians tell to explain how it came to float: it was on this island, which did not previously float, that Leto, one of the eight firstborn gods, who was living at Buto where she now has her oracle, hid Apollo for safety when Isis entrusted Apollo to her on this same island which is now said to float.

Leto fear was the rage of Typhon the Ocean.

On an Abyssinias island shown on a Genoese World Map of 1457, there appears to be a floating house, and near it, almost verbatim from Pomponius Mela's De Chorographia (c. 43 AD),

In hoc lacu insula est tenis que lucos silvasque ac grande appollinis templum sustinet natat et quocumque venti agunt appelliatur

Translated,

In this lake there is an island, Tana by name, which contain forests and groves and a great temple of Apollo. This island floats and is driven in whatever direction the winds blow.



It is indeed possible that immigrated Ionians had earlier brought with them the tale of Delos, infusing it into local lore in which Egyptians might have seen mythical truth apart from the observable fixedness of an islet long farmed.

Chemnis, as shown on the map, "Aegyptus Antiqua" in Abraham Ortelius' Theatrum Orbis Terrarum edition of 1595,



'Chemni insula" detail rotated

Delos

The modern island of Delos, thought by some to be the ancient island of Ortygia, lies near the center of the Cyclades archipelago southwest of the Greek mainland.

Delos' mobility, while central to the mythology in later times, was not an established belief in the beginning. The 7th century BC Homeric "Hymn to Apollo" merely describes Delos as fearing lest it should be sunk in the depths by the spurning foot of a newborn god, not as an island that might have fled the footstep.

It was in later times that allusions to the island's mobility enter the record, and by this time, it was in the past tense.

"Hymn to Delos," by Callimachus (310/305–240 BC), scholar at the Library of Alexandria, gives the address of Apollon, still in the womb, to his mother Leto:

But mark thou, mother: there is to be seen in the water a tiny island, wandering over the seas. Her feet abide not in one place, but on the tide she swims even as stalks of asphodel, where the South Wind or the East Wind blows, withersoever the sea carried her. Thither do thou carry me..



Pindar's "On Delos" speaks of the island's translation from a floating to an anchored state.

For aforesime, that isle was tossed on the waves by all manner of whirling winds; but, when Leto, the daughter of Coeüs, in the frenzy of her imminent pangs of travail, set foot on her, then it was that four lofty pillars rose from the roots of earth, and on their capitals held up the rock with their adamantine bases. There it was that she gave birth to, and beheld, her blessed offspring.

"To Delos" by Callimachus (c. 260 BC), likewise anchors Delos when Leto touches it



Leto giving birth to the twin gods on Delos

Vergil's Aeneid (29-19 BC) mentions the instability of Delos before the wandering Leto found sanctuary, as does Ovid's Metamorphoses (8 AD) Strabo's Geography (c. 7-18), Pliny's Naturalis Historia (c. 77-79) and Stalius' Thebaid (c. 80-92). From Alethius' "Carminaq" in Anthologia Latina (c. 355),

*Delos, now held in place by solid earth,
Once floated on the purple sea
And as the wind urged moved lightly here and there,
Tossed about by the waves.*

An Introduction to the Natural History of the Terrestrial Sphere (1763), by Rudolf Raspe, represents a turn toward the scientific.

The first tradition from the Ancients. At the time when the jealousy of Juno confined Asteria's sister, Latona, pregnant as she was from a clandestine affair with Jupiter "so that this great earth should not provide a place for the birth," as Ovid poetizes in Metamorphosis, "wandering Delos at last provided an unstable place for her to be delivered" and, "an island which floated lightly then." As a result, it was called the wandering isle by Pindar.

But who would allow himself to be persuaded by poets and legend that Delos, this rocky island 8 miles in circumference," and weighed down by Mt. Cynthus and other rocks, ever floated about in the sea here and there in the same manner as those floating islands in Lake Vadimonisose or those which the histories of Denmark, Friesland and Bremen make famous?

But would it, from this account, necessarily have floated? Could it not be that it moved about in some other way and been unstable?

Raspe's geological hypothesis:

New islands which appear as the result of earthquakes do move about since their foundations are mobile and unstable. They are not thrust forth from the sea by a single movement; here they are lifted. there lowered, increasing with uneven movement, according to the force of the earthquake or wind enclosed, or accordingly as the force of the subterranean fire is more confined or released. So we now see that the new island which appeared in 1707 near Santorin emerged through an unequal movement and from this it was assumed that it actually floated according to the report sent from Santorin:

"Since the motion by which the new island daily increased in elevation and area was not always equal, so it did not increase equally each day on all sides. Often, it was lowered and diminished at one place, while being uplifted and enlarged at another. One day, a rocky crag, remarkable for its size and shape emerged from the sea at a distance of 40 to 50 feet from the middle of the island. I decided to watch this rock in particular, for a period of four days. At the having appeared and disappeared several times, finally reappeared and remained stable."

Delos, propelled from the floor of the sea and uncertain whether to emerge or sink again, floated for a while, until firm foundations should be built underneath and the fury of the earthquake which raised her should subside.

Unfortunately for the explanation, the island of Delos is not igneous, but granitic. If the gods anchored the island, they did it 11-15 million years ago.

Symplegades

Drawing upon a half-millennium of Greek tradition, the epic poem *Argonautica* by Apollonius Rhodius (3rd century BC) twice alludes to floating islands in the saga of Jason and the Argonauts

The first is simply in naming. The two sons of Boreas, winged members of the Argonaut crew, help Phineus, a prophet who is plagued by daily vexations of the Harpies. The pair chase the creatures, catching them at the Isles of Planktai, oft translated as the "wandering" or "roving islands." After the Harpies are sworn no longer harass Phineus, the islands receive a less-mobile name.

Because of this mortals call them the Turning-Point Islands, which before they had called the Floaters.

In his commentaries on Homer, Eustathius of Thessalonica (1115--1195) offers a practical explanation.

Plotae [Planktai] are so called not because they are moved in respect to their location, as is said of Delos, but because the navigation through them is winding.

The second reference is the Symplegades as twin rocky islands whose clashing threatened any ship attempting to pass.

There was a time when Ortygia floated on the waves, now it is fixed, and the Argo's crew feared the Symphlegades' collisions, and the spray of their crashing waves, islands that now stand there motionless, and resist the winds.

The route of the Argonauts passed through the Symplegades, rock cliffs that closed to crush that which traveled between them. Jason knew to release a dove when approaching the islands, if the dove made it through, to row with all might. Seeing the dove's survival, the crew rowed through the peril, after which Orpheus renders the rocks immovable by his lyre.

"The Argonauts Pass the Symplegades" (1733),
etching by Bernard Picart



The Symplegades -- or better put, the inspiration for their mobile attribute -- may have been the rocky islands the Thracian the entrance to the Black Sea, minor formations today, but imperiling to early seafarers.

As familiarity with the Mediterranean expanded, there was a tendency to locate rumored geographic wonders further and further afield, one theory suggesting, for example, that the Symplegades were in the Gadeira archipelago in the Bay of Cadez, and another, at Pamphylia, modern Turkey.



Some suggest that the myth of the Symplegades had its source in a tsunami coming up the Bosphorus; others deduce sailor's story of an iceberg.

William Pickard, "The Symplegades," *Greece & Rome* 34 (1987) employs fluid mechanics to argue that mythical "clashing rocks" or mobile islands were most likely "distortions of prolonged oral transmission."

Maximum [Mediterranean] wavelength corresponds to a period of roughly ten seconds. In turn, swell waves of this period can be expected to have occasional wave heights (trough to crest) in the neighborhood of seven meters. However, waves of such dimensions lie at the extreme lower end of the allowed period range and are so uncommon as to make it doubtful that they would have suggested to observers the perpetual quality of the rocks' motion. That is, major ground swell could produce the requisite illusion but not on a regular basis. Therefore, if an explanation in terms of ground swell is to be accepted, it must be coupled with the qualification that the occasional apparent periodic rock motion was transformed into ceaseless clashing by the distortions of prolonged oral transmission.

George Sandys' 1632 commentary on Ovid's *Metamorphoses* speculates that the island might have consisted of pumice stones, the subject of Chapter 30.

The Cyanae or Symplegades... are two great Rocks, which lie where the Euxian Sea rusheth in at the Thracian Bosphorus; and in that so near, as oft appearing but as one to the sailor,

seeming also to move by the motion of the ship, they were feigned by the Poets unstable, & at sundry times to jostle one another.

Yet this disproves not but that islands there are which swim on the water. I myself have seen one (sayeth Seneca) in the Lake of Cutilia, adorned with trees and fruitful in pasture, carried hither and thither, not only by the wind but the air, insomuch as never constant to one station; proceeding from the gravity of the water and levity of the earth, though bearing trees, yet of no solidity. Created perhaps with the concretion of whatsoever floated on the lake by the glutinous moisture; the stones porey, and not subject to sink, of the nature of pumice. I have heard a seaman constantly avouch, and that with oaths how being about the close of the evening within sight of an island, and lowering their sails, least they should fall upon it in the dark, could neither see it in the morning, nor find it for all their search; not doubting of the removal thereof.

The Symplegades, as described by Lucian of Samosata (c. 125-180) in his Vera Historia, a fanciful elaboration of the Greek saga, is a very different type of floating island, a floating mat of vegetation, a phenomenon well known to the Romans.

We had not yet gone five hundred furlongs [50 miles] when we saw a very large, thick forest of pines and cypresses. We thought it was land, but in reality it was a bottomless sea overgrown with rootless trees, in spite of which the trees stood up motionless and straight, as if they were floating. On drawing near and forming an idea of the situation, we were in a quandary what to do, for it was not possible to sail between the trees, they being thick and close together, nor did it seem easy to turn back. Climbing the tallest tree, I looked to see how things were on the other side, and I saw that the forest extended for fifty stades or a little more, and that another ocean lay beyond. So we resolved to lift the ship on to the tree-tops, which were thick, and cross over, if we could, to the farther side; and that is what we did. We made her fast to a large rope, climbed the trees and pulled her up with much ado. Setting her on the branches and spreading our canvas, we sailed just as if we were at sea, carried along by the force of the wind.

We managed the wood in spite of everything and reached the water. Lowering the ship again in the same way we sailed through pure, clear water.

Strophades

The Strophades, two islets off the Greek Ionian coast, appear to be a variant of the Symplegades, an example of how myths can wander, much as might a vagrant floating island.

"Rocks of the Strophades."
engraving by William Miller (1829)



Aeolus

Ancient Aeolus is thought to have been one of the volcanic archipelago near Sicily. Homer's Odyssey mentions the island on which dwelt Aeolus, keeper of the wind.

*So we came to the floating island of Aeolia,
where Aeolus lived*

The tale itself makes no further mention of flotation, but that perception of Aeolus is with us yet. Alexander Pope's translation,

*At length we reach'd Aeolia's seagirt Shore,
Where great Hippotades the sceptor bore,
A floating isle!*



Homer could have been more explicit about how Odysseus traveled west to east and back again by bringing the explorer within hail of such celebrated features as the Aethiopes and the Hyperboreans. Some have supposed that the transition from west to east is mediated by Aeolus' floating island, arguing that it might have moved to a different position by the time Odysseus landed on it for the second time, but the poet gives no hint that this was in his mind.

While the Bible mentions no floating islands, in the series of the coming of the seas, the similarities between Homer and the biblical author Mark are dense and sequential.

Odyssey 10:1-69

Mark 4:35-41

Odysseus's crew boards and sits down.	Jesus boards and sits down.
On a floating island Odysseus tells stories to Aeolus.	On a floating boat, Jesus tells his stories to the crowds.
After a month, Odysseus takes his leave and sails with twelve ships.	When it is late, Jesus takes his leave and sails. "Other boats were with him."
Odysseus sleeps.	Jesus sleeps.
The greedy crew opens the sack of winds and creates a storm: "All the winds rushed out."	A storm arises: "And there was a great gale of wind."
The crew groans.	The disciples are helpless and afraid.
Odysseus awakens and gives hope.	Jesus awakens and stills the storm.
Odysseus complains of his crew's folly.	Jesus rebukes his disciples for lack of faith.
Aeolus is master of the winds	Jesus is master of winds and sea.

Ambrosiai Petrai

The portal out of the Mediterranean was once thought to be framed by the Pillars of Hercules, the Ambrosiai Petrai, beyond which, according to Plato, lies the island of Atlantis.

Upon these twin rocks was a solitary flaming olive tree upon which perched an eagle and a crafted bowl. A serpent coiled around the trunk and branches. Peaceful status quo prevailed, with neither the snake nor the eagle attacking the other. Likewise, the blazing olive tree was never consumed by the fire. The bowl never slipped from the branches, despite the maritime gales. In contrast to suspended animation that existed on them, the Ambrosian stones themselves drifted rootless around the Mediterranean.

Ambrosian and the Olive Tree



Britannia After the Romans. Being an Attempt to Illustrate the Religious and Political Revolutions of that Province in the Fifth and Succeeding Centuries (1836), by Algernon Herbert, continues the story.

Nonnus, a poet of the 5th century, gives this account [in his epic Dionysiaca]. Hercules Astrochiton commanded the first men, who sprang out of the mud, and were coeval with the world and time itself, to build

A sea-chariot, the first vessel that ever sailed. Then he bade them navigate in all directions, until they arrived at the predestined place, where two rocks sail about wandering unstable in the sea, which nature hath named Ambrosae, upon which, rooted in them, flourishes the inseparable plant of the coeval olive, growing in the center of the sea-faring rock. And (he added) ye shall behold an eagle sitting by the loftiest tufts of it, and a patera placed within reach. And spontaneous fire vomits wonderful scintillations from the flaming tree, and the glory of it plays about the unconsumed olive-plant, and a twining serpent disports himself around the high-growing tree.

They were next commanded to catch the eagle and sacrifice him to Neptune, and then the floating rocks would become fixt and stable, and furnish a site for the city of Tyre.

It cannot be collected from this passage whether the two rocks were connected or separate, whilst in their floating state, but as the olive, which grew on one, is said to have grown on both, the probable inference is that the poet understood them to be connected at the base.

The citadel of Tyre was built on the newly-rooted stones, with a temple for the worship of Melqart. Per Herodotus in Histories 2.44,

Because I wanted to know more about it, I made a voyage to Tyre in Phoenicia, because I had been told that in that place there was a holy temple of Heracles. The sanctuary was richly furnished, there were many votive offerings, and I noticed two pillars: one of pure gold and one of an emerald stone of such size as to shine by night.

Chapter 1 -- Consult the Classics

For two days in latter September, 1492, Columbus sailed into the Sargasso Sea, the vast oval area blanketed bright green and yellow sargassum gulfweed in the mid-South Atlantic. The crew, who had never seen anything of this nature before, took alarm. Fearing their ships would be "frozen" in sargassum, they demanded that the captain change course to find safe water. Columbus plowed straight ahead, but as late as the end of the 19th century, seafarers deemed the sea to be such a peril, as evidenced by Thomas Janvier's In the Sargasso Sea (1896).

The stream carried all that was caught in its current -- like the spar and plank floating near us, so that the sea was covered with a thick tangle of the weed in which were held fast fragments of wreckage and stuff washed overboard and logs adrift from far southern shores, until in its central part the mass was so dense that no ship could sail through it nor could a steamer traverse it because of the fouling of her screws."

"Among the Vanished," New York Press, April 12, 1914, by Percy Hamilton, provides another example.

May I never again experience a moment of such mental agony as I suffered when there came upon me a full realization of the fact that I was lost upon what was apparently a huge floating island of seaweed.

With a knowledge which I did not then possess, you have probably decided that I was on that vast stretch of floating gulf weed, between Newfoundland and the Azores, known as the Sargasso Sea.

"Jesus the Teacher," Biblical Review 2 (1917), by A.H. Tottli, equates the Sargasso Sea to "floating island" and sermonizes that a floating magnet will migrate to "the top of the world," presumably where Jesus awaits. In scientific fact (Chapter 20), it will just point that way.

I once saw a tourist on the deck of our ship in midocean, about to cast upon the waves a large cube of cork, and asked him his purpose. He replied: "To have something to think about when I wish to escape the cares of office. I will in my imagination try to track the voyage of that cork."

I told him that I could tell him what would probably become of his cork. Barring accidents, it would be tossed by the billows, driven by the winds and storms, hurled by the currents and tides; but through it all would float south until at last it would find its destiny in that vast floating island known as Sargasso, the sewage of the Atlantic. "But," I added, "if you will firmly imbed a powerful loadstone in the heart of your cork, it will have a different history. By the might of the mystical magnetism within and its affinity for the pole, it will pull its way through all the storms and tides to the North. And were it not for the ice it would find its home at the top of the world."

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In "The Lost Empire" by Frank Wall, serialized in The Thrill Book, July-August 1919, noted explorer Godfrey Boone is flying over the Caribbean when he sights a forested, settled area beneath where only sea has been recorded. He lands and finds that he is in the Sargasso Sea where a floating island has developed on top of the seaweed and the inhabitants are a lost race of the 17th century. Boone meets a friendly young woman and a villain and the remainder is predictable.



The Desert Religions

To this point we've been traveling very much in the past. Today we find no floating parcels where the map indicates, and most of us, in fact, have reasonable doubt that we would have physically encountered such islands in any earlier era.

But persistent ideas needn't always be objective. The pre-religious cosmology of those who would later formulate the great desert religions, Judaism, Christianity and Islam, begin with what, in effect, was that of a floating island.

The cosmology of Thales (c. 624-546 BC) is known to us through Aristotle's Metaphysics, written some 250 years later.

That from which is everything that exists and from which it first becomes and into which it is rendered at last, its substance remaining under it, but transforming in qualities, that they say is the element and principle of things that are... For it is necessary that there be some nature, either one or more than one, from which become the other things of the object being saved... Thales the founder of this type of philosophy says that it is water.

Aristotle considered Thales' position to be roughly parallel to the later ideas of Anaximenes, who held all things to be composed of air.

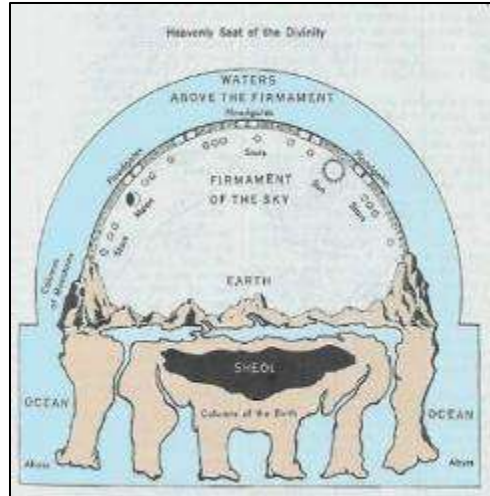
Others say that the earth rests on water. For this is the most ancient account we have received, which they say was given by Thales the Milesian, that it stays in place through floating like a log or some other such thing (for none of these rests by nature on air, but on water)

Thales could have visited the floating Reed Islands in Lydia, later noted by Pliny (Chapter 32), and such observation might have seemed to substantiate his earth-above-water hypothesis. Thales likewise could have been influenced by knowledge of the **Babylonian** deity Marduk who was said to have created the earth by heaping soil on a rush mat floating on the universal primordial sea. Today's Marsh Arabs (Chapter 36) no longer worship Marduk, but still dwell on floating mats of rushes.

The Hebrews, likewise influenced by both environment and surrounding culture, envisioned a cosmology sustained, at least in part, by water.

A pictorial representation

As Judaism, Christianity and Islam draw from a common cultural well, the water-before-earth creation sequence is common to the three.



Earth above water cosmology is likewise common to creation mythologies far removed from the Middle East. Hugh Stait, for example, mentions in *The Bavenda* (1931) that the Venda and BaThonga tribes in Southern Africa believe the earth to be a disk floating in water. Emergent land floating upon the primordial ocean is common to many Native American groups (Chapter 5).

Summary

We've visited

The Egyptian floating island of Chemnis,
Delos, birthplace of a god,
The rolling rocks of Symplegades with Jason and the Argonauts,
The Strophades, which uncannily resembled the Symplegades,
Aeolus, in the footsteps Odysseus, and
Ambrosiai Petrai en route to Atlantis, on the advice of Plato.

As to which story originally goes with which floating island, we can't always be certain. But perhaps that doesn't matter. Stories passed generation to generation to explain what we feel to exist eventually lose anchor to physical time and location.

We've noted how the concept of floating land manifested itself in ancient cosmologies, and though we're aware of no contemporary faiths based on floating islands, we recognize that the concept has long resonated with our search for the sacred.

A floating island in Mauretania, i.e. northwestern Africa, is mentioned by Strabo and Pliny, although both are inclined to dismiss the account as untrue.

Strabo 17.3.3

They say that the Emporicus Bay has a cave which at high tide admits the sea to a distance of seven stadia, and that in front of this bay there is a low, level tract with an altar of Hercules upon it, which, they say, is never covered by the tide.

Pliny 5.1.3 locates the island in question at Lixus, Morocco, and the island in the river Loukos, and indicates that it was on this island that the mythical Garden of the Hesperides was located, where a serpent guarded a tree with golden apples, until Heracles killed the serpent and took the apples.

An arm of the sea stretches inland here with a winding channel, and they now say that this channel is what is represented by the guardian dragon. This channel surrounds an island which is the only spot that is never flooded by the sea, even though it is somewhat lower than the rest

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of the land nearby. Upon this island there is an altar of Heracles, but of the gold-bearing trees of the story, there is nothing left besides some wild olive trees.

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CHAPTER 2

QUERY THE BRITS

To better our sense of floating islands, we've the folk tales of the British and Faroe Isles.

Per the Chambers's Encyclopedia of 1874,

Imagination has always invested with a peculiar interest the "Stragglings plots, which to and fro do ronne in the wide waters" and ancient legend did not fail to notice the floating islets of the sacred Vandimonian Lake, which were large enough to bear away cattle that were tempted upon them by their fresh green grass; and the island of the Cutulian waters, which carried on its surface a dark and gloomy grove, and was constantly changing its place.

The quote is from Edmund Spenser's The Faerie Queene (1590), verse that would have been familiar to an English schoolchild. When the character Guyan sees distant islands floating upon the floods, exclaims, "Land!" The ferryman informs him that these are the Wandering Islands, which, fair and fruitful though they may appear, must be shunned.

*Many errant knights hath foule fordonne:
Within a wandring island, that doth ronne
And stray in perilous gulfe*

As retold by M. H. Towry in Spenser for Children, Stories from The Faerie Queene (1878)

At last, with many pains they struggled past, and came into easier waters, where the light bubble danced along. Soon they spied islands floating on every side.

Then said Guy, "I descry land, old sire. I pray thee direct thy course thither."

"That may not be," said the ferryman. "These isles are not firm land, but stragglings plots, floating to and fro in the wide waters; therefore they are called 'The Wandering Isles.'"

They seemed fair and fruitful, and tempted the wearied travelers, for the grass was green, and the trees covered with white and red blossoms. But he who set foot on them was doomed to wander forever.

"Spenser's Use of the Literature of Travel in the Faerie Queene," Modern Philology, November 1921, by Lois Whitney, notes the obvious.

Spenser's reference in this passage to the island of Delos suggests a classical source for the idea, but it is worth noting that there was still a widespread belief in the sixteenth century in the existence of floating islands. They were usually referred to as St. Brendan's Isle, or sometimes the Isles of St. Brendan, and often appeared on the early maps in various parts of the Atlantic.⁴

So firm was the belief in such an island as St. Brendan's that various expeditions were sent out to find it, and it was said by the Portuguese, Louis Perdigon, that the king of Portugal had ceded the island to his father "if he could discover it."

Spenser seems to have relished in allusions to floating islands. A few more:

*A little gondelay, bedecked trim
With boughes and arbours woven cunningly
That like a litle forest seemed outwardly*

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*Eftsoones her shallow ship away did slide
More swift than swallow sheres the liquid skie
Withouten care or pilot them to guide,
Or winged canvas with the wind to flie.'*

*At last far off many Islands spy,
On every side floating the floods among*

*For those same islands, seeming now and then,
Are not firme lande, nor any certain wonne,
Straggling plots, which to and froe doe ronne
In the wide waters*

*An island waste and void
That floated in the midst of that great lake*

*Islands which doe fleet
In the wide sea*

From In Northern Mists, Arctic Exploration in Early Times (1911) by Fridtjof Nansen

On the coast of the English Channel, sailors have stories of floating islands, which many of them have seen with their own eyes. They always fly before ships, and one can never land there. They are drawn along by the devil, who compels the souls of drowned men who have deserved Hell and are damned, to stay there till the Day of Judgment. On some of them the roar of a terrible beast is heard; and sailors look upon the meeting with such an island as a sinister warning.

"Beira, Queen of Winter," Wonder Tales from Scottish Myth & Legend (1917), by Donald Mackenzie, is another floating-island tale.

Dark Beira was the mother of all the gods and goddesses in Scotland. She was of great height and very old, and everyone feared her. When roused to anger she was as fierce as the biting north wind and harsh as the tempest-stricken sea. Each winter she reigned as Queen of the Four Red Divisions of the world, and none disputed her sway. But when the sweet spring season drew nigh, her subjects began to rebel against her and to long for the coming of the Summer King, Angus of the White Steed, and Bride, his beautiful queen, who were loved by all, for they were the bringers of plenty and of bright and happy days. It enraged Beira greatly to find her power passing away, and she tried her utmost to prolong the winter season by raising spring storms and sending blighting frost to kill early flowers and keep the grass from growing.

Beira lived for hundreds and hundreds of years. The reason she did not die of old age was because, at the beginning of every spring, she drank the magic waters of the Well of Youth which bubbles up in the Green Island of the West. This was a floating island where summer was the only season, and the trees were always bright with blossom and laden with fruit. It drifted about on the silver tides of the blue Atlantic, and sometimes appeared off the western coasts of Ireland and sometimes close to the Hebrides. Many bold mariners have steered their galleys up and down the ocean, searching for Green Island in vain. On a calm morning they might sail past its shores and yet never know it was near at hand, for oft-times it lay hidden in a twinkling mist. Men have caught glimpses of it from the shore, but while they gazed on its beauties with eyes of wonder, it vanished suddenly from sight by sinking beneath the waves like the setting sun. Beira, however, always knew where to find Green Island when the time came for her to visit it.

So close is the connection between the remnants of Druidical worship and the legacy of folktales that it is natural for floating islands to be converted from sanctuaries into appurtenances of the "small people." The symbolic ark, the "Caer," or "fenced enclosure," was said to be an island, and hence the sanctuaries, or enclosed circles of the Druids, were likewise termed "caers" or "islands."

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As an example, tradition assures us, there was once a floating island in a small lake in the mountains of Breconshire, where all who visited were hospitably entertained by the Fair Family, though none of its produce might be carried away. But, alas, a man bore off one of its bright flowers and scarcely had he touched the mainland when the isle sank and the culprit lost his senses.

Taliesin, a 6th century poet, whose work has survived in the Middle Welsh Book of Taliesin, speaks of the island sanctuary as,

*Wandering about from place to place
On the surface of the ocean,
On a wide lake, the sea surrounds it, and
On the ninth wave;*

Sometimes the billows assail it, and

With speed, it removes before them.

The island

Has arrived within the gulf or bend of the shore, it lifts itself on high, and fixes itself on the margin of the flood.

The same floating-island fondness can be ascribed to the Scots. From Wonder Tales from Scottish Myth & Legend (1917) by Donald Mackenzie

The myths and legends of Scotland are full of what is called "local color ". They afford us not only glimpses of ancient times and of old habits of thought and life, but also of the country itself at different times of the year. In the winter season the great mountain ranges are white with snow and many inland lochs are frozen over, but along the west coast, which is washed by the warm surface waters of the Atlantic and bathed in mild moist breezes from the south-west, there may be found sheltered and sunny spots where wild flowers continue to bloom. The old people believed that somewhere in the west the spirit of Spring had its hiding-place, and they imagined this hiding-place to be a green floating island on which the sun always shone and flowers were always blooming.

And perhaps even more so for the Irish.

"Of an Island Which at First Floated, and Afterwards Was Firmly Fixed by Means of Fire," Topographia Hibernae (c. 1188) by Giraldus Cambrensis,

Among the other islands is one newly formed, which they call the phantom isle, which had its origin in this manner. One calm day, a large mass of earth rose to the surface of the sea, where no land had ever been seen before, to the great amazement of the islanders who observed it. Some of them said that it was a whale, or other immense sea-monster; others, remarking that it continued motionless, said, "No, it is land."

In order, therefore, to reduce their doubts to certainty, some picked young men of the island determined to approach nearer the spot in a boat. When, however, they came so near to it that they thought they should go on shore, the island sank in the water and entirely vanished from sight. The next day it re-appeared, and again mocked the same youths with the like delusion. At length, upon their rowing towards it on the third day, they followed the advice of an older man, and let fly an arrow, barbed with red-hot steel, against the island, and then landing, found it stationary and habitable.

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Whether we should count French poetry from the time when England was somewhat French as British literature, we're unsure, but in the 13th century Arthurian poem Messire Gauvain, ou, La Vengeance de Raguidel, Raoul de Houdenc makes mention of a castle "en l'île qui flote."



From George Owen's Description of Pembrokeshire (1603),

Farre of in the sea standeth the land Gresholme so called of Mr. Saxton, but of the neighbours Walleyes, a small land VIII miles from the maine, and for the Remotenes thereof and small proffettes it yeldeth, is seldome frequented.

This island, now called Grassholm, is the westernmost point of Wales. From an interview with Capt. John Evans, Pembroke County Guardian, November 1, 1896,

Once when trending up the Bristol Channel and passing Grassholm Island, in what he had always known as deep water, he was surprised to see to windward of him a large tract of land covered with a beautiful green meadow. It was not, however, above water, but just a few feet below, say two or three, so that the grass waved and swam about as the ripple flowed over it, in a way quite delightful to the eye, so that as one watched it made one feel quite drowsy.

"You know," he continued, "I have heard old people say there is a floating island off there that some-times rises to the surface, or nearly, and then sinks down again fathoms deep, so that no one sees it for years, and when nobody expects it comes up again for a while. How it may be, I do not know, but that is what they say."

According to William Howells' Cambrian Superstitions (1831),

The Milford Haven folk could see the green Fairy Islands distinctly lying out a short distance from land; and the general belief was that they were densely populated with fairies.

Lauder, Thomas Dick, "Legend of the Floating Islet," Highland Rambles and Long Legends to Shorten the Way (1837) is a tale of two lovers who spend a night marooned on a floating islet in the middle of a loch

"See!" cried she, the moment she could get her breath, whilst she pointed sportively to the little floating islet which was at that moment lying motionless, and almost in contact with the shore near to the spot where they were sitting, "See, see, Robby, how our wee bit feiry kingdom is waitin' yonder to bid us welcome!"

At the time my story speaks of, the borders of the loch were less encroached upon by weeds and rushes than you have seen that they now are, and the island lay, as if it had been moored, as mariners would say, in deep water close to the shore. It was, therefore, but a short step to reach it, and Robin easily handed the trembling Mary into it,

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The lassie's light foot hardly made its grassy surface quiver as it reached it, but, full of his own frolic, and altogether forgetful for that moment of the precarious and kittle nature of the ground he had to deal with, he sprang in after her with a degree of force which was far from being required to effect his purpose, and so great was the impetus which he thus communicated to the floating islet, that it was at once pushed several yards away from the shore.

The prose is a wee bit racy, we admit, but it's only for the sake of English Literature.

How mixed, yet how antagonist to each other were the ideas which now passed rapidly through his mind! At one moment he felt a strange and indescribable rapture as the mere thought crossed him that this small floating spot of earth did indeed contain no other human being but himself, and her whom he would wish to sever from all the world besides, that she might be the more perfectly dependent on himself alone

The moon now shone forth in full radiance, and speedily dissipated the broken fragments of the fog that yet remained. One mass only, denser than the rest, still hung poised over their heads, naturally maintained in that position by the attraction of the damp floating earth they stood on. To their great joy they perceived that the breeze was increasing, and that their motion was gradually accelerating

The floating island had touched the terra firma for some seconds, but still the conscious pair dared not to peep from beneath the covering that enveloped them. They lay, as I might say, as quiet as two mice in a bag of meal. They uttered not a word. They hardly even dared to breathe. But tremblingly in need of support under circumstances so very trying, the poor lassie Mary clasped her Robin about the waist with an energy equal to the terror she was moved by. It was the feeling of this her utter dependence upon him for support and defense that first subdued Robert's own fears, and awakened him to a sense of his own dignity as a man.



"The Floating Island, a Legend of Loch Dochart," Harper's, November 1851, is such a sad tale that we can't bear to tell it, but we can pull out enough the references to the floating island to make the plot somewhat guessable.

Gently she laid the little one by the margent of the water, amid the green rushes; and the breeze of night sweeping by murmured plaintively to them, and caused them to sigh, and rock to and fro around the infant. Then the poor mother withdrew a space from the babe, and sat her down upon a white stone, and covered her face with her long, thin, bloodless hands. She said in her heart, as Hagar said, "Let me not see the death of the child."

The bewildered mother essayed to spring across the stream that now flowed between her and the island, but in vain; her strength failed her, and as she sank to the earth she beheld the island floating slowly away upon the waveless bosom of the lake, while eldritch laughter rang from out the rushes, mingled with sweet tiny voices soothing with a fairy lullaby the cries of the

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babe that came fainter and fainter on the ears of the bereaved mother, as the little hands of the elfin crew impelled the floating island over the surface of Loch Dochart.

The people feared the child had been drowned, and searched the loch along its shores. Nothing, however, was found which could justify their suspicions; but, to the astonishment of the searchers, they discovered in the midst of the lake a small island, about fifty feet in length, and more than half that in width, covered with rushes and water-plants. No one had ever seen it before, and when they returned with others to show the wonder, they found that it had sensibly changed its position.

At length some fishermen passing by the floating island, scared a large kite from the rushes, and discovered the decaying body of the hapless girl. How she had reached the island none could say -- whether it drifted sufficiently near the land to enable her to wade to it in her search for her babe, and then floated out again from the shore; or whether beings of whom peasants fear to speak had brought her there..

In Alan Garner's *The Weirdstone of Brisingamen* (1960), the Lady Angharad lives on one of the two floating islands of Logris.

And it inner very big, either," said Gowther.

"But... but... it can't be an island!" said Susan.

"I know it conner: but it is."

"It's not possible!" said Colin.

"That's reet."

"But..."

"It is in truth an island," said Durathror. "And, by the blade of Osla! I did not look to such a fair ending to this day's work."

"Hush!" said Fenodyree. "And lie low awhile."

On the nearer shore, fifty yards away three mara were casting about to pick up the vanished scent. They walled, and whooped, and peered at the ground, uprooting bushes and bending trees.

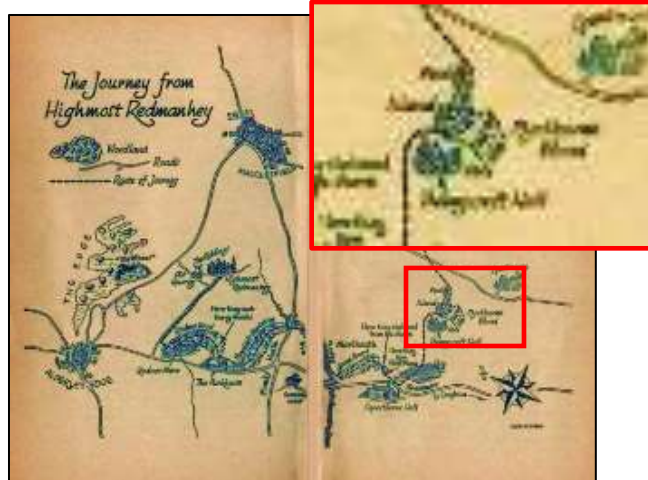
"The must be pretty dim!" said Colin. "Why didn't they find us? Anyone with half an eye could have guessed where we were: our footprints must have ended at the water."

"Yes, but they knew we were somewhere close," said Susan. "Why didn't they try this island?"

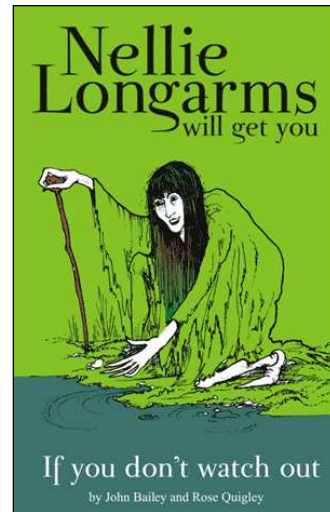
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"Ah, but they did not know: they have never seen us. All they have seen are tracks that end in water. For the mara that is no puzzle, their minds look no further than their eyes, and I think that to their eyes this island is hidden."

"This is the Isle of Angharad Goldenhand, the Lady of the Lake, and it is one of Two Floating Islands of Logris. It was lodged against the shore when Angharad guided our feet hither. Here no evil will threaten us. For one night we may lie at peace, and the Lady will watch over us."



In the West Midlands, floating bogs have their own folklore, with cautionary tales of water-sprites serving to warn children of the dangers of these places. Jenny Greenteeth was a widely-known water sprite, associated with a range of watery places, but Nellie Longarms was special to Wybunbury Moss in Cheshire.



Nellie Longarms Will Get You If You Don't Watch Out (2007)
John Bailey and Rose Quigley

The Western Sea

The isle of Tír na nÓg floated far to the west. It could be reached by either an arduous voyage or an invitation from one of its fairy residents. .

Fairies of the mythological race Tuatha Dé Danann lived on beautiful Fortunate Isles floating in the Western Sea off the shores of Ireland and Scotland

The Turning Islands

Regarding these islands, see Chapter 81, as it's the lodestone that keeps them floating.

Faroe Islands

The Faroe Islands lie 160 miles north of Scotland.

- Mykines
- Vaago
- Sorvaag
- Koltur
- Suko
- Fugloy
- Svinoy



The floating island lore of Mykines, the westernmost main island of the Faroe Archipelago, is noted by William Craigie in "Mikines," Scandinavian Folk-Lore (1970).



According to tradition, Mikines was a floating island. A man in Sorvaag, who was in the habit of going out to fish, was very much afraid of the big whales out at sea, and having no beaver's scent to drive them away with, he used for that purpose bull's dung, which he threw into the sea when the whales came near the boat. Once as he sat in his boat and was driving along the west side of Vaago, he saw a large island come out of the mist. All the fishermen drew up their lines, and rowed towards it as fast as they could. The man from Sorvaag, who had first caught sight of it, threw the dung up on a ness which they came to, and then went ashore himself. The island was made fast by the clung that was thrown up on the ness, and from that it is said to have got the name of Mykjiness (muck-ness)

Other traditions relate that there was once a giant, who wished to live in the Faroes, but the islands he liked best were too small, and so he thought of putting several of them together. First of all he came to Koltur, and laid it where it is now. Then he went to Skuo, to drag it up beside Koltur, but the folk of Skuo asked him if he really could think of living in the island that "Little Calf" had owned. When the giant heard that a calf had owned Skuo, he would not have it, and thanked them for telling him this, gave them valuable gifts in return and went away.

To the north of the Faroes he next found a large island, which he thought would be good for him to live on ; so he brought it southwards through the seal but when he came right west from Vaago, he was unable to get it any further. He lay there for a week, striving to get the island

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south to Koltur, but without success, he could not move it out of the spot. Then he grew angry, and said, "My life, my life, if I could have got the island past here, I could easily have got this one under the sea," for he did not want anyone to have Mikines to live on but himself.

To this day men are said to have sometimes seen an island north from Vaago, high fells are visible on it, deep dales and white waterfalls. These are mainly Sorvaag men, who have often seen it clearly while watching sheep on the out-pastures where the North Sea is in view. No wonder though the men of Mikines are depressed when word is brought out to them that anyone has seen this island again. Who knows but what the giant is living yet, and may sink Mikines to the bottom in order to get his island brought south and fixed where he wishes it to be?

Svinoy means literally "swine island," though no pigs reside on it. Rather, according to Scandinavian Folk Belief and Legend (1991) by Reimund Kvideland and Henning Sehmsdorf,

There is a story about Svinoy that tells how it was originally a floating island, like some others in the Faroes. It came from the north but was rarely seen because it brought foggy weather with it and was covered by mist. Now you shall hear how it happened that Svinoy came to lie still.

In the village of Vioareioi on Vidoy, the villagers had a sow but no boar, yet the sow had piglets every year. Everyone wondered about this and could not understand how it happened. People did say that she was not in the village sometimes, but she always came right back. One day she trotted off eastward through the village and over toward Eidisvik. A woman managed to tie a bunch of keys to her tail. The sow jumped into the sea and swam away from shore. A little while after this, people on Vioareioi could see an island nearing them from south of the point. As quickly as they could, they manned a boat and rowed out to the island, and now they could see it and land on it. When the sow had carried iron onto that island, it had been fixed, and the fog had evaporated. And it has lain there ever since. People called it Svinoy because it was full of swine when they first went out to it and because a swine had fastened it to the ocean floor, so that it was not a floating island anymore. And it was out there that the sow from Vioareioi had found a mate.

It is said that Fugloy was also floating island. Men had tried several times to approach the island, but every time they tried, trolls who dwelt there threw stones and curses. A priest, however, wanted to try one more time. At his approach, the trolls again began hurling stones, driving the holy father to such despair that he threw his bible at his antagonists. The ground began to shake, the island stopped floating and the trolls were transformed into grassy hills that yet remain on the island.



At a somewhat higher latitude, off the north coast of Norway, was said to be the floating island of Sandflaesen, according to Folk and Fairy Tales (1883) Peter Christen Asbjørnsen and Edmund Gosse.

An old ballad, in the style of Peder Dass, gives a full description of an island off Traenen in Helgeland, called Sandflaesen, with rich fisheries and abounding with game of all sorts. In the middle of the Vestford a large flat land with rich cornfields also appears, but it only rises high enough above the surface of the water to leave the ears of the corn dry, and outside Rost, off the southern point of the Lofoten islands, a similar fairy land with green hills and golden barley fields is spoken of, which is called Udrost.

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Lucas Debes, in Faeroae & Faeroa Reserata (1673), relates that "at various times a floating island is said to have been seen" among the Faroes, but no one can reach it.

The inhabitants also tell a fable of Svinoy, how that in the beginning it was a floating island: and they think that if one could come to this island, which is often seen, and throw steel upon it, it would stand still... Many things are related of such floating islands, and some think that they exist in nature.

Debes believes none of it.

If this was not described of the properties of various islands, I should say that it was icebergs, which come floating from Greenland: and if that be not so then I firmly believe that it is phantoms and witchcraft of the Devil, who, in himself, is a thousand-fold craftsman.

Eric Pontoppida's The Natural History of Norway (1752) protests Debes' "phantasmata and sorcery of the Devil" explanation. Rather,

But as, according to the wholesome rule, we ought to give the Devil his due, I think that the devil who in haste makes floating islands is none other than that Kraken, which some seamen also call 'Soe-Draulen,' that is, the "sea troll."

The dreaded Kraken will re-emerge from its watery home in Chapter 45.

Isle of Man

In the 17th century, it was believed that the Isle of Man once travelled unattached around the Irish Sea before becoming anchored in its present position

Martin Csombor, who visited England in 1618, notes in Europica Varietas (1620) that the Isle of Man is celebrated, because it has no foundation and is blown hither and thither by the winds, and thus changes its position as much as 300 English miles.

William Blundell's History of the Isle of Man (1653) confirms the perception.

I believe the old Arms of the Isle of Man was a ship -- yea, and that most meet and fitting... because floating in the ocean, it resembleth a moveable island.

Emerging earth science was soon to dispel the myth, but lore carries on. as noted by George Waldron in The History and Description of the Isle of Man (1744).

Their island was once much larger than it is at present, but that a magician who had great power over it, and committed many wonderful and horrible things, being opposed by the one who was a friend of the place, and, at length, overcome by him, he, in revenge, raised a furious wind, not only in the air but also in the bosom of the earth, which rending it, tore off several pieces, which floating in the sea, in process of time were converted into stone, and became those rocks which are now so dangerous to shipping. The smaller fragments, they say, are sands, which, waving up and down, are at some times to be seen, and at others shift themselves far off the coast.

Note the closing question from of "Debate in the Commons on the Bill to Vest the Isle of Man in the Crown," 1765, a petition from the Duke of Athol regarding the administration of the Isle of Man.

The proprietor [Duke] admits, that offences have come, that abuses have arisen, and that illicit practices have been carried on in his island: but he declares upon his honor, which he values much more than his island, that he has never given countenance, encouragement, or protection, to such illicit practices. It is his wish and his desire that government may be able to correct and suppress them all. But is he answerable for the increase of smuggling in the Isle of Man? Is he answerable for the ill use that other men have made of his property? Is he responsible for the failure and inefficacy of the excellent plans which the wisdom of his Majesty,

Chapter 2 -- Query the Brits

and the vigilance of his councils, have formed for redressing this great evil? Is the situation of the island to be imputed to him? Was it ever a floating island, and did he fix it where it is?

Members of Parliament would have been acquainted with the floating island lore and known it to be untrue, and thus would have answered the last question, no, patterning like answer to rhetorical questions regarding responsibility. Barristers knew neural-linguistic programming in 1765.

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CHAPTER 3

SEEK A SAINT

Through the act of canonization, the Catholic Church declares a deceased person to be a saint. Our question: how many of these saints traveled on a floating island?

(We'll end the chapter with a bit of advice regarding floating islands from a most non-Catholic holy man.)

St. Kilian's Flagstone

St. Kilian was an Irish missionary bishop in Bavaria towards the end of the 7th century.

"On Some Ecclesiastical Bells in the Collection of the Lord Primate," Proceedings of the Royal Academy of Ireland 8 (1864), by William Reeves, tells how Kilian caused a flagstone to float miraculously across Templeport Lake, and this same flagstone was for years thereafter used as a ferry by the locals.



St. Kilian... had at Fenagh a herd of oxen, which on a certain night strayed from their pastures, and in the morning were nowhere to be seen by the owner. Guided by inspiration, or led by an unseen hand, the saint in his search after them arrived at the shore of Templeport Lake, where they were found, gazing earnestly towards the middle of the lake, and motionless, like dogs when setting game. The saint inquired if anything strange or unusual had happened the night before, and he was told that a traveling woman, a perfect stranger, had sought shelter at an early part of the night, and had been conveyed across to the island in the lake, where she had been safely delivered of a son; and that while in labor she had caught hold of the bed-post, which presently threw down roots into the floor, and shot out branches upwards, that protruded through the roof of the house

St. Kilian ordered the boat to be put over to him, that he might cross to the island, and baptize the child. The woman of the house made answer, that the boat was not at hand, as her good man had gone a fishing to a distant part of the lake. Whereupon the saint, as well became him, devoutly prayed that the man might never more set his foot on land. He next inquired if there was anything in the house upon which the child might be floated across to him, to which the woman replied that the only flat article in the house upon which the infant could be laid was a flag in the kitchen that was used as a hearthstone. The saint ordered her to fetch it to the water edge. The woman said she could not lift it, and that, if she did, it would serve to drown the babe.

"Try it," said the saint. She did so, and, to her utter surprise, carried it as if it was a bit of board to the desired place; she laid it on the water; lo! it floated; she brought out the child, and laid him upon the dry surface; the wind arose, and, with steady but gentle impulse, bore the buoyant flagstone to the opposite bank...

This swimming flagstone was for ages preserved at Templeport, and was employed as a boat to ferry over dead bodies to the island for interment; till one day a young man and woman, who happened to cross over on it, were guilty of some indiscretion in the transit, when the flag

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snapped in two, and one half of it sank, helping to drown the inconsiderate couple, while the other half, of its own accord, floated away to the shore near Templeport church.

St. Michael's Sign of Returning Favor

St. Michael the Archangel has not been canonized because angels don't qualify for the honor, but he is venerated with as "Saint" in the [Catholic Encyclopedia](#).

The Two Chiefs of Dunboy; or, An Irish Romance of the Last Century (1889) by James Froude, speaking of the Church of Kilmakilloge

A few hundred yards off was a pond, to which St. Michael, as a sign of returning favor, gave miraculous virtues. A floating island rose once a year in the middle of it, and a bath in the water, while the island was above the surface, made the lame to walk and the blind to see.



"The Pattern," Ierne: A Tale (1871) William Trench, a fictionalized account of a religious celebration of the floating islands at Kilmakilloge. The character Kathryn is talking to an inquisitive stranger.

"There is a small lake, or rather pool, near the old Catholic church of Kilmakilloge, and in this pool are several tufts of rushes and coarse grass, which, strange to say, float or move about in some unaccountable manner on the pattern-day, each year, when the people are assembled. That the tufts do move I have from undoubted authority, and the moment they begin to float the people rush down into the water, sometimes up to their knees, in the hope of being cured of whatever disease they have ; and if they have none, of a safe preventive of disease. One side of the pool is sometimes crowded with hundreds of people waiting for the movement of the tufts."

"And do the tufts really move?" asked the stranger in surprise.

"Well, I really believe they do," replied Kathleen with some hesitation. "The people generally believe the movement to be miraculous, and certainly when large numbers are collected on the edge of the pool the tufts are observed to shake. A general cry is then raised that they are about to float. Whereupon numbers rush down to the edge to take advantage of the movement, and enter the pool at the proper time. This general gathering, it is supposed by some, makes a pressure on the sides of the boggy pool, which are at all times soft and elastic, and whether from this cause, as some people think, or from any other, I really am unable to say, but there is no doubt that frequently when the great gathering of people comes on one side of the pool, the tufts float off to the opposite side, and this satisfies them all that a miracle has been performed."

No evidence of such floating islands remains today, but note that in A Topographical Dictionary of Ireland (1837). Samuel Lewis uses the present tense.

The ruins of the old church still exist in the burial-ground near the harbor of Kilmakilloge; and at Lochurt are the remains of a druidical circle. In the vicinity of Ardea is Lough Quinlan, in which are some remarkable little floating islands.



St. Maedoc's Flagstone

St. Maedoc (c. 558-626) was the first Bishop of Ferns. Michael O'Clery, in The Martyrology of Donegal: A Calendar of the Saints of Ireland (1864), relates how the infant Maedoc was conveyed on a flagstone from the island in Templeport on which he was born to his baptism

Among his first miracles was the flag-stone upon which he was brought to be baptized, upon which people used to be ferried out and in, just as in every other boat, to the Island in the lake, on which he was born.



For centuries afterwards, it plied from mainland to island whenever locals were to be buried in the island graveyard, the coffin being placed on the stone which then without human agency, conveyed it to the burial ground.

From Annals of the Kingdom of Ireland 4 (1856) by Michael O'Clery, Cucogry O'Clery, Ferfeasa O'Mulconry, Cucogry O'Duigenan and Conary O'Clery,

The flagstone on which St. Maedoc was carried to be baptized, was used as a ferry-boat to carry people from and to the island on which he was born... till a few centuries since, when, in consequence of the misconduct of a young man and woman on board it suddenly sunk, and left the passengers to shift for themselves on the surface of the lake.

In some versions of the tale, one half sank to the bottom bringing with it the irreverent pair and the other half completed its journey to the island, where some say it may yet be seen. The lovers' story should sound familiar, as we heard it regarding St. Kilian's flagstone.



The island today in Templeport Lake

St. Vouga's Floating Rock

Sixth-century Archbishop Vouga of Armagh crossed the Irish Sea on a large floating rock. John O'Hanlon tells the miraculous story in Lives of the Irish Saints (1873).

Vouga then returned thanks to the Almighty, for thus manifesting his divine approval. Leaving his Sea of Armagh and its residence by night, he sought the sea coast, where, however, he found no vessel to carry him away. There were some large rocks beside the shore, and these were to furnish a means for transit.



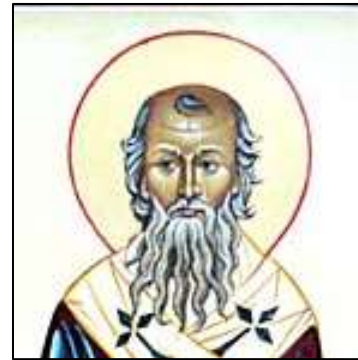
One of the legends concerning him states, that he mounted on a huge stone, which he wished to serve as a ship, and that it should move to whatever place had been allotted for his residence. He sailed across the sea on it until after a voyage of nearly twenty-four hours, he was wafted towards Armoric Britain. He entered the port of Cornuaille, known as Penmarch or Penmarck. Fables have been added to this voyage, which probably had been undertaken in an ordinary sailing vessel of the time.

Thus it is related, that people on the shore were astonished at the sight of the rock floating towards them with St. Vouga alone on it, and that when he had landed in their presence, the rock floated out to sea again, and directed its course back to Hibernia, whence it had come.

St. Malo on the Seaweed

St. Malo was born about 520, probably in Wales and evangelized the Orkney Islands and the northern isles of Scotland. Jetta Wolff tells of the saint's childhood in Stories of Saints and Martyrs (1903).

One day the child Machutus [Malo] was out playing with his schoolmates upon the sandy beach. Growing tired of his games, he strayed away from the other lads, and sat down to rest upon a bed of sea-weed. In a few moments the boy's head sank upon the soft bank, and lulled by the calm of the autumn evening, he fell sound asleep.



The other lads were too full of their play to miss little Machutus. Then the tide rose, and the children, driven back from the shore by the flowing waves, went home to the monastery. Now they began to look round for their comrade. He was nowhere to be seen. Abbot Brendan himself ran in haste down to the beach.

"Machutus, Machutus!" he cried. But there was no reply; only the swell and surge of the rolling waves fell upon the Abbot's ear. Darkness came on quickly, and he was obliged to return to the monastery. He spent all that night in lonely, earnest prayer... There in the morning light, not very far off, was the lost boy standing alive and well on a mass of seaweed which seemed to float upon the waves; he was singing some of the hymns he had learned at the convent.

"My boy! my boy!" And then, Nay, stay where thou art! move not," he cried in an agony of fear, as the child, overcome with joy, seemed about to throw himself into the water, and try to swim to the Abbot.

So the little lad, used to obedience, stayed quietly on the bed of floating seaweed, and the two talked to each other across the space of sea, till in a little while the mass was borne by the waves close up to the shore.

St. Monenna's Trip to England

St. Monenna was born in Ireland in the 5th century and founded the convent of Sliabh Cuillin with nine sisters.

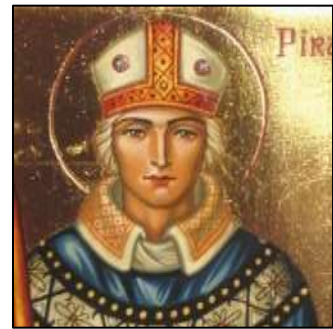
When the group needed to travel to England, but found no ship, God sent an angel who cut the land upon which they stood into an island and floated it to England.



St. Piran's Arrival at Cornwall

Legend Land, Being a Collection of Some of the Old Tales Told in Those Western Parts of Britain Served by the Great Western Railway, Now Retold by Lyonesse (1922)

Some sixteen hundred years ago, so tradition tells, there lived in the South of Ireland a very holy man named Piran. Such was his piety that he was able to perform miracles. Once he fed ten Irish kings and their armies for ten days on end with three cows. Men sorely wounded in battle were brought to him to be cured, and he cured them. Yet the Irish grew jealous of his power and decided he must be killed.



And so one stormy, boisterous morning the pious Piran was brought in chains to the summit of a high cliff, and with a huge millstone tied to his neck his ungrateful neighbors hurled him into the raging billows beneath. This horrible deed was marked, as the holy man left the top of the cliff, with a blinding flash of lightning and a terrifying crash of thunder, and then, to the amazement of the savages who had thus sought to destroy him, a wonderful thing happened.

As man and millstone reached the sea the storm instantly ceased. The sun shone out, the waves and the wind died down, and, peering over the edge of the cliff, the wondering crowd saw the holy man, seated peacefully upon a floating millstone, drifting slowly away in the direction of the Cornish shore, some hundreds of miles to the south-east.

St. Piran's millstone bore him safely across the Atlantic waves until at length -- on the fifth day of March -- it grounded gently upon the Cornish coast, between Newquay and Perranporth, on that glorious stretch of sand known today as Perran Beach. Here the saint landed, and, taking his millstone with him, proceeded a little distance inland and set himself to work to convert the heathen Cornish to Christianity.



St. James' Stone Boat

To this point, our saints have been associated with the British Isles. We add St. James the Greater to this list because being an original Disciple, we argue, grants him universal credentials.



When the Disciples dispersed to different parts of the world, James went to Spain, where in Fisterra, where he found the locals hostile to his message. The Virgin Mary appeared to him in a stone boat guided by angels, encouraging the Apostle to persevere.



What's said to be Virgin Mary's stone boat today, Santiago de Compostela.

James later returned to Jerusalem and was beheaded by Herod, after which his followers took his body to Jaffa where another stone boat miraculously awaited them and so returned to Spain.

The Prayer Book of Charles the Bold, (c. 1471), however, employs an illustration of Christ using his foot to push to sea a small rocky island upon which sleeps St. James the Greater as he floats from Jaffa to Galicia.



St. Brendan's Isle

Saint Brendan (c. 484-577), one of the Twelve Apostles of Ireland, is best remembered for his seafaring quest described in the 9th century Voyage of St Brendan the Navigator.

St. Brendan and crew drifted from island to island in the Western Sea, "God's stepping stones," until they came to a larger island where they dwelt for months before returning home.

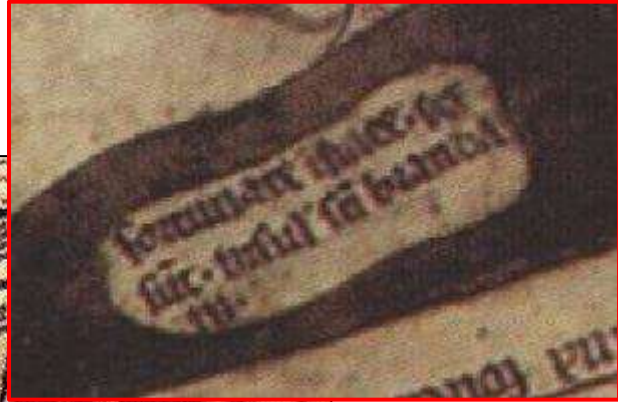


St. Brendan's Isle is often equated to the Fortunata Isle, the blissful mid-Atlantic paradise (also referred to as the Isles of the Blessed) in Greek and Celtic mythology. Tales of the isle were known to Christopher Columbus before his first voyage. From Personal Narrative of the First Voyage of Columbus to America (1827), a summary of Columbus's diary by Bartolomé de las Casas,

The Admiral says, that he was assured by many respectable Spaniards, inhabitants of the island of Ferro... that they every year saw land to the west of the Canaries, and others of Gomera affirmed the same with the like assurances. The Admiral here says that he remembers, while he was in Portugal, in 1484, there came a person to the King from the island of Madeira, soliciting for a vessel to go in quest of land, which he affirmed he saw every year, and always of the same appearance. He also says that he remembers the same was said by the inhabitants of the Azores and described as in a similar direction, and of the same shape and size.

In terms of the isle's wanderings, so to speak, the title of "St. Brendan's Mythical Isle in Toponymic Drift: From Iceland to Ecuador," Atlantic Visions (1989), J. de C. Ireland and D.C. Sheehy, eds., speaks for itself, though as we shall see, period maps suggest a route from Africa to the Canadian coastline. In either case, the island unfailingly drifts just beyond the fringes of maritime exploration.

The Hereford Map (c. 1275) includes the first cartographic appearance of Brendan's Isle, the inscription being "Fortunate Insulae sex sunt Insulae Set Brandani" near the site of modern Canary group,

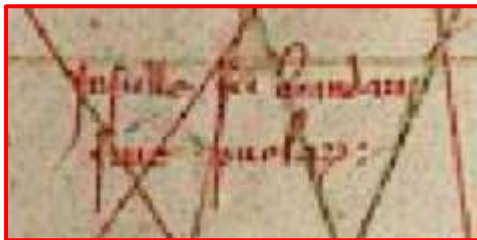


East is to the top.
Gibraltar is at the bottom.

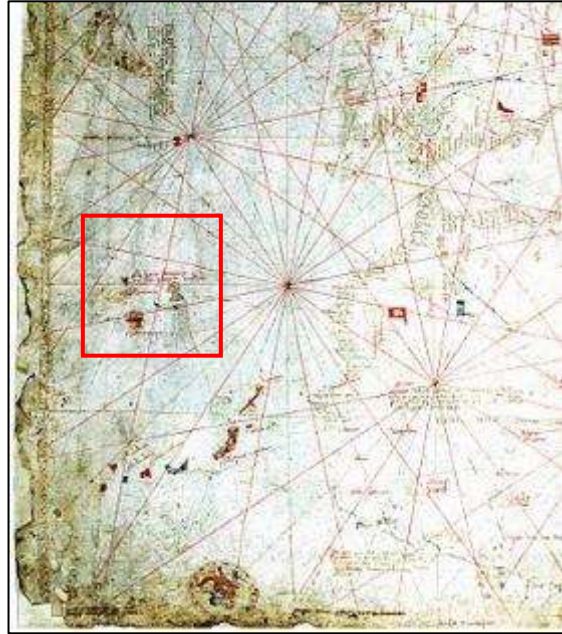
The Ebstorf Map (c. 1300) indicates "Lost Island. St. Brendan found this. It has been found by no man since he sailed from it" in the same location. Again, east is to the top.



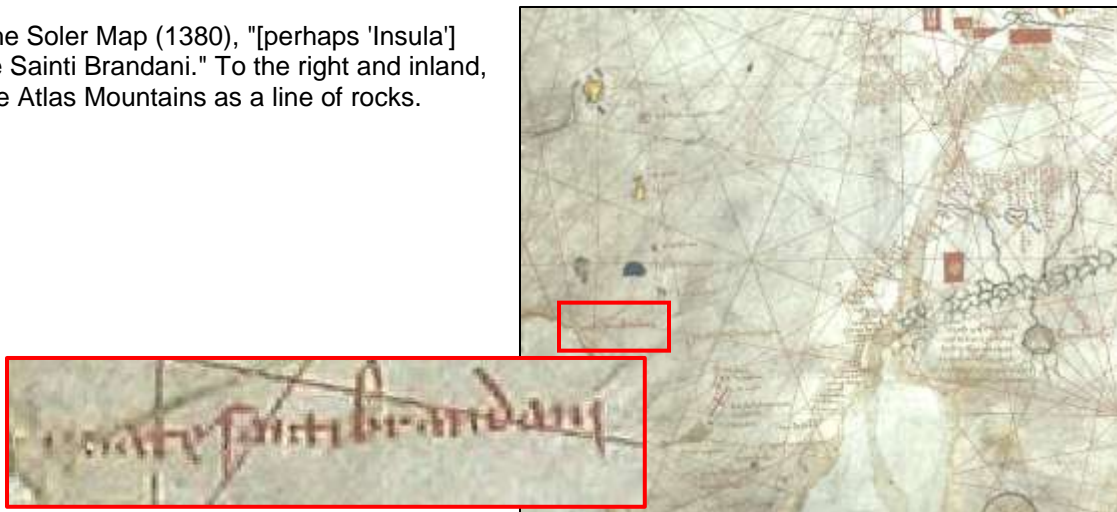
The Dulcert Map (1339) shows "Insulle Sa Brandani" again southwest of Gibraltar.



The Pizigani Map (1367) includes a holy figure blessing "Ysole d'ctur sommare sey ysole pone le brandany," likely meaning "the islands called of slumber or the islands of St. Brandan," a little further out to sea



The Soler Map (1380), "[perhaps 'Insula'] de Sainti Brandani." To the right and inland, the Atlas Mountains as a line of rocks.



The Book of Lismore (prior to 1417) reflects the island's awe.

Vast is the light and the fruitfulness of that island, its rest, its lovableness, its dearness, its stability, its security, its preciousness, its smoothness, its radiance, its purity, its lovesomeness, its whiteness, its melodiousness, its holiness, its bright purity, its nobleness, its restfulness, its beauty, its gentleness, its height, its brightness, its venerableness, its full peace, its full unity!

Chapter 3 -- Seek a Saint

The Beccario Map (1426), "Insulle fortunate santi brandany," again west of Morocco.



The Bianco Map (1448) shows a slanting array of islands farther out, arranged in two groups, two islands and five islands, the rediscovered Azorean archipelago. The largest island, "ya fortunat de sa. beati blandan."

The Pareto Map (1455). "Insulli fortunati sant brandany." To the left, a rectangular Atlantis, an island we'll visit in Chapter 75.



In Historias de las Indias (1552-61), Bartolome de las Casas says that St. Brendan's Isle lies among the Cape Verde Islands and the Azores, and that "the same is mentioned in the book of Inventio Fortunata," a now-lost work of a 14th century Franciscan friar.

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The Sebastian Cabot Map (1544), probably not Cabot's work, places "de la Seines Sanbranan" not far from the scene of Cabot's and his father's explorations.



The Ortelius Map (1570)



A more-fanciful Ortelius (1570) rendition



Belief in such an isle -- be it Brendan's, Fortunata, or Blessed -- was widespread into the 16th century, by which time nautical exploration and navigational sophistication had pushed its geographical assignment off the Atlantic charts.

That isn't to say, however, that the island disappeared from reference. Voyages of Hawkins, Frobisher and Drake: Select Narratives from the Principal Navigations of Hakluyt (1907), Edward Payne, ed. quotes Richard Hakluyt regarding John Hawkin's 1564–1565 excursion through the Santa Cruz de Tenerife region of the Canaries,

To speak somewhat of these islands, being called in old time Insulae Fortunatae, by the means of the flourishing thereof, the fruitfulness of them doth surely exceed far all other that I have heard of.

About these islands are certain flitting islands, which have been oftentimes seen, and when men approached near them, they vanished; as the like hath been of these islands now known, by the report of the inhabitants, which were not found of long time one after the other. And therefore it should seem, he is not yet born to whom God hath appointed the finding of them.

Michael Hemmersaml's entry for January 29, 1645 in Reise nach Guinea und Brasilien 1639-1645 (1663) describes the sighting of a floating island with golden soil somewhere between the African island of Sao Tome and Brazil. It's not named, but its location fits that of St. Brendon's, give or take the standard deviation of mythology.



The Delisle Map (1707) represents one of the final mappings of Brendan's Isle. The cartographic game was over.



From the Norman French version, 12th and 13th centuries, "The Anglo-Norman Trouveres," Blackwood's Edinburgh Magazine, June 1836.

*Then Brandan said, "Brothers, know well
Wherefore this strange mischance befel,
No land was that, but monstrous beast,
Whereon ye sought to hold your feast;
Nor marvel thus why this should be,
Hugest of all are fish in sea,
For they were formed by heaven's great King
Before all other earthly thing.*

From the Book of Lismore (prior to 1417)

Now alter the Easter was come, the great sea-beast raised his shoulder on high over the storm and over the wave-voice of the sea so that it was level, firm land, like a field equally smooth, equally high. And they go forth upon that land, and they celebrate the Easter there, even one day and two nights.

Chapter 3 -- Seek a Saint

On the Nova Typis Transacta Navigatio 1621 map, "Is. S. Brandano" lies northwest of "Cabo Finis Terrae." To the southwest lies the "Insulae Fortunatae," the center one, "M. Canarie." An enormous sea-beast with curved tusks, a thin beard, a collar of scalloped skin around its neck, spouts water from two openings in its forehead. The creature propels itself by means of fins which terminate in a two-forked tuft. A ship rests athwart the creature's tail. On its shoulder, an altar has been erected.



Postage stamps from Ireland and Jersey honoring St. Brendan



As fire safety is an important concern, we'll cover it in Chapter 9, Sr. Brended being a major character In Chapter 6, we've graphic renditions of St. Brendon's boat upon the monster fish Jasconius.

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St. Conall

The Irish connection is, in fact, still being promoted. Brian Friel's play Here I Come (1993) opens with the characters looking around them in wonder and disbelief.

Trish: *Where are we, Terry?*
Frank: *Arcadia.*
Terry: *Ballybeg pier - where the boat picks us up.*
Trish: *County what?*
Terry: *County Donegal.*
Trish: *God. Bloody Indian territory.*



Terry has invited them all to travel to the island with him, and he produces a picnic hamper full of champagne for them to drink while they are waiting at the dock for the boat to arrive that will take them out.

Trish: *You never said it was a big island, Terry.*
Terry: *It's not big, is it?*
Trish: *That's a huge island.*
Terry: *Is it?*
Frank: *Hard to know what size it is -- it keeps shimmering. Angela: Has it a name, our destination?*
Terry: *Oilean Draoichta. What does that mean, all you educated people?*
Trish: *That rules me out. Where's our barrister?*
Berna: *Island of Otherness; Island of Mystery.*

When Trish asks Terry if it is only a mirage, Terry replies by describing the island as he remembers it.

Terry: *There is a legend that it was once a spectral, floating island that appeared out of the fog every seven years and that fishermen who sighted it saw a beautiful country of hills and valleys, with sheep browsing on the slopes, and cattle in green pastures, and clothes drying on the hedges. And they say they saw leaves of apple and oak, and heard a bell and the song of colored birds. Then, as they watched it, the fog devoured it and nothing was seen but the foam swirling on the billow and the tumbling of the dolphins.*

Terry relates that he was taken there long ago by his father, recalling how he fasted the night before, ate only bread and water while on the island and prayed at three mounds of stones. He also remembers a holy well where his father filled a bottle with water and corked it with sea grass, and the ruins of a medieval church dedicated to the Irish saint named Conall.

Regarding Catholic Saints on Floating Islands

Of the roughly-200 canonized servants of God in the British Isles, we've identified seven said to have voyaged on floating islands. As we have only the vaguest of record regarding some of the earlier saints, there may have been additional floaters.

Of the 12 disciples of Jesus, one is said to have traveled in like manner, albeit posthumously.

Whereas the population of angels is not agreed upon, it seems significant that the archangel himself created a floating island.

Six (plus perhaps a few more) out of 200, or one out of 12, or the highest one of many cannot be dismissed as insignificant. Floating islands have played their part in Church history.

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Swami Dayanand Saraswati

But lest we imply that our list of venerated persons with a tie to floating islands is confined to Catholic luminaries, we add the 19th-century Hindu religious leader and founder of the Arya Samaj reform movements of the Vedic dharma, Dayanand Saraswati.

Dayanand Saraswati is, in fact, not a character in a floating-island saga, but as we will see at the end, imparts to us an insight regarding the topic.



India's Lake Rewalsar in the state of Himachal Pradesh is advertised for its seven floating islands of reed. Should we visit the site, however, we may find less than what we've been led to expect.

Let us begin with a legend.

Princess Mandarva, daughter of Tibetan King Mandi, resolved to dedicate herself to religious life. Her father agreed and she took her vows. Padmasambhava, an emanation of the Buddha Amitabha, having observed that she was a dedicated pupil, appeared from heaven to give her teachings.

When a cowherd reported seeing the princess with the unknown stranger, however, her father thought that his daughter had broken her vows and had her cast into a deep hole. Padmasambhava was tied to a wooden pyre which was set on fire. When the smoke did not clear for a week, the King visited the spot and found that the site had turned into a lake with lotus in the center. Repenting, the King offered Padmasambhava his kingdom and Princess Mandarva as his bride.

The lake's seven islands are said to be inhabited by the spirit of Padmasambhava and movable by prayer. Three Buddhist monasteries and three Hindu temples today adorn the banks.

As expressed in Travels into Bokhara, Together with a Narrative of A Voyage on the Indus (1834), traveler Alexander Burnes is skeptical about the role of Padmasambhava.

A grave and respectable man assured me that he had seen a lake, called Ruwaesir, in the hill district of Munde, on the Sutlege, which had three small islets floating upon it. These are a place of Hindu pilgrimage; and my informant assured me that they approach to receive the votaries who embark upon them and are floated out with their offerings. It is obvious that there must be some delusion or deception, which is practiced with no small dexterity, as the place retains its character. A native told me that he had heard it was an artificial heap of soil placed over reeds; but he had not visited the spot, and seemed to proffer his information from hearing my doubts as strongly expressed as I felt them.

Chhaya Sharma, in "Origin of Floating Islands in the Lakes at Khajjar and Rewalsar in Himachal Pradesh," Palaeobotanist 19.3 (1970), employs pollen analysis to show the islands are likely of human origin, subsequently evolved into a self-perpetuating biological system.

The open water is studded with seven main "floating islands" of different sizes and shapes. The largest amongst these called "Parbati's island" by the local people, measures about 18 m. and

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3-6 m. in length and breadth respectively, whereas others are comparatively much smaller in size. These "floating islands" have apparently much less free movement and are comparatively less impressive to look at than their counterpart in the lake at Khajjar.

The phenomenon of "floating islands" loses much of its mystery in the lake at Rewalsar, as *Phragmites communis* still continues to grow at the fringes of the lake, forming thickets along with a number of other grasses and sedges. One often comes across a jumble of loosely entangled rhizomes of *Phragmites*, floating deep inside the margin of the lake.

Since Rewalsar happens to be a big center of pilgrimage for Buddhists, it is quite likely that the Creation of several "floating islands" of *Phragmites* in the lake was initially induced by man for religious worship. It is supported by the fact that the stratigraphy of the lake basin does not show evidence of any large scale deposition of *Phragmites*-peat at any stage. In fact the organic sediment in the lake is largely constituted of organic detritus originating chiefly from grasses-other than the *Phragmites*, and the sedges. From this, it appears that the luxuriant growth of *Phragmites* on the "floating islands" as well as at the fringes of the lake, is perhaps connected with Buddhist religious practices, and probably it was initially introduced at Rewalsar through the agency of man.

While we may find the scientific framework a more plausible than the mythical one, the latter will probably stick with us longer.

The islands are yet touted in the region's tourist literature, a la "Rewalsar with its lake of floating islands."

But why, we might ask, upon visiting the site, do we see the islands we're led to expect, however they came to be? What we do encounter are the following.



The first photo shows a symbolic island decked in prayer flags, basically a floating flower pot. The second photo is of an otherwise-unremarkable bank-side tuft of reeds with this signage.

It is believed that spirit of Padmasambhava also known as Guru Rinpoche in Tibet resides inside the floating reed..

As for modern travel-diary web postings,

There were floating islands on the lake of Rewalsar that consisted of tall woody perennial grasses. But due to increasing influx of tourists and pilgrims these floating islands have vanished

At one time, the place had floating islands that covered the lake of Rewalsar but these have also decreased and the increasing inflow of pilgrims is damaging conservation efforts. The death of fishes is an annual recurrence.

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The lake is dotted with seven huge masses of reeds, which give the appearance of small floating islands when the breeze is strong.

There had been a small floating island inside the lake but at the time, when I visited this place, it was removed under the lake cleaning process.

The lake also has a small floating island in the center, which we couldn't visit, but it is believed that gods live under the island. Over time, they say, you can see it change position.

It's time to consult The Light of Truth, the Satyarth Prakash (1984), the magnum opus of Swami Dayanand Saraswati.

Q: At Rewalsar rocks float on the surface of the water. At Amarnath, lingas (of ice) form by themselves... Are these things also not worthy of belief?

A: No. With regard to the Rewalsar miracle, there must be some mechanism by which the rocks are made to float. At Amarnath, glaciers of ice are formed, what to say of small lingas of ice... By such means these scoundrels rob the ignorant of their money.

Forget the legend, advises the swami. Nature is responsible. Shysters may tell you otherwise, but it's to relieve you of your rupees.



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CHAPTER 4

LOOK FOR OUTRIGGERS

The lore of the Pacific has no shortage of floating islands, a few of which might have basis in fact. Should we come upon an island adrift in that ocean, the presence of outrigger canoes may help us identify which island we've encountered.

We'll confine this chapter to folk tales of the Pacific in which floatation -- as opposed to an island simple gone missing, Chapter 78 -- is an aspect. Seth Thompson's definitive Motif-Index of Folk-Literature (1989) would classify such tales as "F737 -- Wandering Islands."

We'll reiterate portions of a number of myths. Needless to say, kernels of one story can be recognized in a tale today told thousands of miles distant. We'll not attempt to trace the roots, but like the Pacific Islanders themselves, the history is surely one of ocean crossings.

Cook Islands

Patrick Nunn. Vanished Islands and Hidden Continents of the Pacific (2008)

Another myth identifies the "floating island" Nuku-tere as Rarotonga. In this myth, the wandering island Nuku-tere was located by the god Tonga-iti who stamped on it to stop it moving. His wife Ari then dived down to fix the island's foundations, after which the island was named Tumu-te-varovaro.

Te Ariki-tara-are, and S. Percy Smith, "History and Traditions of Rarotonga: Part II," Journal of the Polynesian Society 8 (1899), transport by means of a mythical floating island)

Then Tinirau gave into the hands of his brother-in-law the mi-ara-kakano, and instructed Kurumau-anaki not to undo it until he got to the land, then open it.

Kuru went off, floating on the island to take him. He went on it until he reached a certain place, Where he said, " (Let there be) a house for me here." The house appeared; that house was filled with property. "(Let there be) a beautiful garden here for me." That garden was full of food. And so he went on, until the land was filled by the mi-ara-kakano.

When the news reached the wife-the daughter of Tau-rangi of those houses filled with property, together with the fine cultivations, the Woman returned and joined her husband. He now proceeded to carry out his Work, and floated off" on the island until he reached Tonga-nui.

From Part VIII of the same story, Journal of the Polynesian Society 29 (1920),

Tonga-iti and his wife Ari, whose country was a land, the name of which is lost. This is the description of this land [i.e. Rarotonga]: It was drifting about on the surface of the ocean. When Tonga-iti and Ari found it, it was floating about. Tonga-iti climbed on to it, and trod on it [to make it firm] while Ari went underneath to fasten the foundations, and thus it became firmly fixed in position.

We may note here the mention of their finding the island "floating about," and of their fixing it in position. This is the same story as the Morioris have in reference to the adventures of Kahu, the first visitor to the Chatham Islands according to them, and Kahu, is supposed to have fixed the islands where they now are. The Maori account of the settlement of the Chathams says that one of the later migrations came from Rarotonga, and hence perhaps the origin of the two stories is the same.

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Fiji

From "A Veritable Floating Island: One of the Wonders of the South Pacific Ocean," New York Times, July 6 1878,

The existence of a floating island, Wagaqele, in Vanun Lovu, is known to very few, probably, besides those natives who reside in or near the district of Nndogo, to the north-east of the Province of Macuata.

The "tankei" had clambered up a tree on the island, (or a tall bush called nalaka) and was adjuring; the island-god to move; the girls were on the opposite side of the mare, in the full flow of meko. About half a dozen natives were pulling about a small island in the highest glee, and a number both of men and women were on the large island with the taukei who seemed to be the genius loci, helping; him (with stout poles) to move the mass. Everyone was in the highest spirits.

It is 50 paces in length und about 20 in breadth, and is composed entirely of firm turf, in some places quite dry, being thickly covered with tall rushes, kuta, besides several nalata bushes 15 to 20 feet high.

There are four islands in all. Three are of the size and appearance of that on which we stood. Ono has three balawa trees on it, and appears to have been more recently detached from its moor. The fourth island is smaller, being only about 15 foot in length, and on it was the scene of moat uproarious mirth.

At one time we counted 10 men on it... The aggregate weight of the 10 people must have been about 1,500 pounds, and the island sank several inches, and canted ominously until relieved of part of its burden.

At the time of our visit the size of the more was about; 250 yards by 150, but probably after much rain it is three times that size. We had no means of judging the depth other than by swimming, and we can only say than we found it to be more than two fathoms in the middle.

A folktale,

We were told of some girls who attempted to swim across the mere without asking [the local god] Dro Walavala's permission, and they swam and swam and swam, but could not get across at all. Then they remembered the god, and went home for a present. Alter that they crossed easily. One man, too curious, is said to have put his hand below the island to see what it was made of, and when he drew back his arm, his hand was gone.

"Floating on an Island," Fiji Times, February 22, 2009, by Rashneel Kumar,

The drano has two huge islands, one of which amazingly floats. It is believed that both used to make a circular trip around the Floating Island ,however, one of it has anchored itself on the side of the lake. The one that is still floating is named Vanalato.

The Vanalato used to move on the tunes of the Bete (or priest) in the olden days but now any person speaking Nubu dialect can command it for a short journey around the drano... The people also believe that the Floating Island has a captain who is really moody and is the one that navigates the Vanalato. When sometimes the island does not move, it is believed that the captain is missing or not in a mood to steer the drano.

More mysteries,

Nine years ago on a beautiful Sunday a boy aged 19 took some visitors who had come to church service in Kelikoso (neighboring village of Kurukuru) for a trip around the lake.

During the trip he was bit off the traditional norm that should be practiced during the visit to the place. Everything went well, the Vanalato responded and left the port (where it harbored) making a circular round. When it was on its way back to its base, the boy jumped into the lake

Chapter 4 -- Look for Outriggers

... maybe to take a quick dip because of the searing heat of the day... [He] was well ahead of Vanalato, swimming towards the land when he suddenly went underneath the water. The other mates accompanying him thought he was just on the way to crack another joke. But he never came up and a search party was called who later found him somewhere floating about meter down the surface of the lake. He did not even have a scratch on his body and even the doctors were unable to find the cause of his inconceivable death.

Vanalato today,



Another story from Fiji:

From the burial grounds, the soul is taken to the floating island Burotukula, believed to be southwest of Matuku, and said to surface at night and submerge at dawn. At least seven sightings have been reported since 1933, some enduring only a few minutes, others, several hours. In *Vanished Islands and Hidden Continents in the Pacific* (2009), Patric Nunn cites the September 4, 2003 journal entry of Emitai Vakacegu, head teacher of Babasea Primary School in Matuku

At about 6 o'clock in the morning, the teachers, students and villagers witnessed a historical scene, the famous and mysterious island of Burotukula surfaced again after 10 years. The first reddish orange light of the rising sun on the horizon formed a beautiful background to the island, which floated alone on the calm sea. The strange island was slowly sinking as the sun rose over the horizon."

"Pulotu, Polynesian Homeland," *Journal of the Polynesian Society* 102:4 (1993), by Paul Geraghty, notes that sightings may be more widespread.

Matuku people are proud of their reputation as itaukei (owners) of Burotu. They explain alleged sightings of Burotu in other parts of Fiji -- notably near Ono in Southern Lau,, between Cikobia and the Yasawa islands,, and south-east of Kadavu -- as being of Burotunawa (floating Burotu), and contrastingly refer to their own Burotu as Burotukula.

- | | |
|----------|-----------|
| ■ Yasawa | ■ Cikobia |
| ■ Kadavu | ■ Ono |
| ■ Matuku | |



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Sumatra

A number of Pacific traditions tell of forbearers relocated when the parcel of land upon which they were living broke free and drifted to sea. It is said on Simeulue Island, west of Sumatra that the cape where Nias islanders once lived broke free with its people upon it. After floating to many places, the island reached a bay of Simeulue and was tied to its mountain.

Tuamotu Archipelago, Polynesia

Patrick Nunn, in Vanished Islands and Hidden Continents of the Pacific (2008), offers the following regarding the Tuamotu Archipelago.

Many Tuamotuan traditions refer to transitory islands of some kind, often described as floating or wandering, which reinforces the belief that they may be founded in part on observations of short-lived sand cays. The stories of wandering islands from the Tuamotus include those of Uporu and Havaiki (possibly the names of Upolu and Savai'i islands in Samoa) that are said to be visible to those on a boat halfway between them. In another story, recalled in a traditional chant, the upstart god Tane is sent to pursue the swiftly moving island Nuku-tere, the name of which means "floating island." The relevant part of the chant, translated by ethnologist J.F. Stimson, is as follows:

*Here is the Sailing Island, the swiftly fleeing land,
Poised to depart on the long voyage to the far shore of Hiva-nui,
Great land of darkness,
Flocking birds, wheeling above the clouds, trail their fleeting shadows on the land,
The Vanishing-Isle is as a migratory bird flashing in undeviating flight, now launched upon the wind.*

It is important not to interpret the idea of a wandering island too literally. It may simply be a metaphor for a group of itinerant people or the memory of a group displaced from a real island.

There are stories from several islands in the Tuamotus about the island named Tongareva; the suffix reva means floating, thus Tongareva is "floating Tonga." The mythical Tongareva is typically mentioned merely in passing, as in a traditional tale from Vahitahi Atoll, where a man-fish character named Tongamaututu meets a school of fish while he is swimming who tell him that they are traveling to Tongareva, underneath the deep bottom of the sea just beyond the reef.

Micronesia

Elizabeth Carr's "The Unexplored -- A Call for Poets," National Forum 76.4 (1996) is a story from Moen Island about a small island that a chief magically made to float and towed home to please his son.

As the canoe was about to go through the pass, the chief got ready to make an extraordinary kind of magic. He commanded each person in the canoe to look out toward the open sea and not, on any account, to look back. Everyone in the canoe obeyed, even the little boy. The chief took a shoot of young coconut leaves in his hand, held it over his head, and sang a magic song. He alone faced the small island. Suddenly the little dot of land with its clump of coconut trees floated up from its moorings on the floor of the ocean and began to follow the canoe.

When canoe and island were well out to sea, the chief allowed the others to look back, and to their delight and wonder and amazement there was the miniature island bobbing along behind the canoe, like a small dog on a long leash. It followed them obediently all the way back to Lukunor. There the chief had it anchored snugly on his home reef, in a spot his son pointed out, where it could be a playhouse-island for him.

Suddenly the little island floated sweetly up on the reef and stopped. The chief said, "Son, this is your island. I have made a new name for it. We will call it Biafo -- that means "New Sand."

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New Zealand

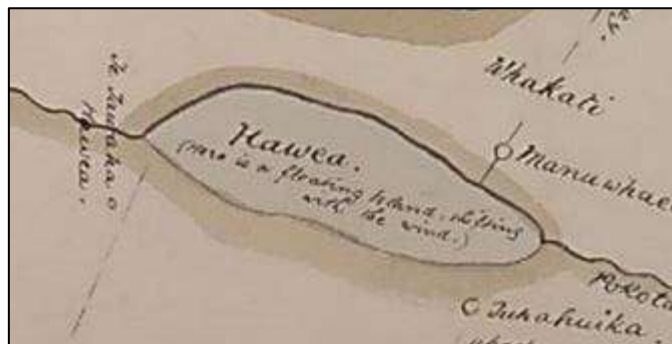
A tale about a floating island in Lake Hawea, South Island, is included in "Traditions and Legends. Collected from the Natives of Murihiku. (Southland, New Zealand," Journal of the Polynesian Society 28 (1919) by H. Beattik. The geological aspect is somewhat different from those above because in this case, the island floated upon an inland lake.

"Up at Wanaka," said one of the old men, "is an island called Te Pae-karara. There is also another island called Taki-karara after a man who had a fishing station at the lake which was called Taumanu-oTaki-karara. He stood on a clump of vegetation on a point of land, and one day the point floated away with a noise like a bird. Unknown to him there was a tipua under it, and it is said to still drift about. This is probably what started the story about the floating island. Taki-karara left the district as it was too uncanny for him."

Tipua is translated as a "goblin, ogre, monster, demon, fairy, spirit," so there is a wide choice of meanings. Mr. D. Monro, writing in 1844, says, "A floating island is said to sail about on one of the lakes at the source of the Molyneux."

Huruhuru's map, drawn for Shortland, in 1844, says of Lake Hawea, "Here is a floating island shifting its position with the wind," and of a place on Hawea's shores, "Turahuka -- the abode of a tipua."

Map from Edward Shortland's The Southern Districts of New Zealand: A Journal, with Passing Notices of the Customs of the Aborigines (1851)



A version by William Taylor in Lore and History of the South Island Maori (1960),

Not long before the white man first saw Lake Hawea it boasted a "floating island". The Maoris looked upon the island as being the handwork of a taniwha, a fabled water monster. The narration says that when a Maori named Taki was fishing on the shore of the lake, the section on which he stood broke adrift and floated about from place to place with the wind. To the pakeha [of European descent], it is quite understandable, especially if he has heard of or seen the "floating island" on the lakelet at Glen Wye, near the Lewis Pass route to the west coast of Nelson.

"Te Whanga-Nui-A-Tara. Wellington in Pre-Pakeha Days." Journal of the Polynesian Society, (September 1901), by Elsdon Best, relates accounts of the Maori extending into the past for at least four centuries, among them, the tale of the goddess Hine Popo.

Even now, it is whispered among us that, upon dark or foggy nights, the dogs of Hine Popo can be heard wailing on the seashore, waiting for her to return. And so our ancestress swam on and on, far out upon the ocean, until she reached a floating island upon which she rested for some time. Again taking to the water she swam until she reached Tokakotuku (a rock in Queen Charlotte Sound) where she again recited her incantations to the Hajniku. Swimming on from here, she reached the Papanui-a-Puta (a rock outside Pelorus Sound) where prayers to the taniwhas were repeated.

Hine Popo is sometimes seen by our people, even in these times. When we are on the shore or traversing the cliffs of Raukawa, we see, at times, far out upon the ocean, the form of Hine Popo floating on the waves and her long hair washed by the waves.

Japan

Kojiki, the Japanese "Record of Ancient Things," was compiled in the 6th of 8th centuries to standardize and preserve Japan's mythic history. Not unexpectedly, an island people make frequent use of islands in their self-story.

At this time the heavenly deities, all with one command, said to the two deities Izanagi and Izanami: "Complete and solidify this drifting land!"

Giving them the Heavenly Jeweled Spear, they entrusted the mission to them. Thereupon the two deities stood on the Heavenly Floating Bridge and, lowering the jeweled spear, stirred with it. They stirred the brine with a churning-churning the brine, and when they lifted up [the spear] again, the brine dripping down from the tip of the spear piled up and became an island [the first of the Japanese chain]..

Izanagi and Izanami bear three children and give command of the Japanese islands to their daughter Amaterasu, who in turn commands her grandson, Ninigi: "Now it is reported that the pacification of the Central Land of the Reed Plains has been finished. Therefore, descend and rule it, as you have been entrusted with it."

Ninigi was commanded to leave the Heavenly Rock Seat. Pushing through the myriad layers of the heavens' trailing clouds, pushing his way with an awesome pushing, he stood on a flat floating island by the Heavenly Floating Bridge and descended from the heavens to a peak.

[He said: "This] is a land where the morning sun shines directly, a land where the rays of the evening sun are brilliant. This is a most excellent place."

Thus saying, he rooted his palace posts firmly in the bedrock below, raised high the cross-beams... and dwelt there

It is said in the Island Hime in Oita was once a floating island drifting on the sea until a god tied it to eight pillars with a rope which yet remains in the rocks. One day a goddess appeared and sowed the island with a thousand spears. The mound beneath which they were buried is called Sen-bon-zuka and should anyone dig any out of it, the island will again float free.

Monk Taichu, who resided on Okinawa in the early 17th century, recorded origin myths of Okinawa in his Ryukyushinto-ki,

At the time of beginning, this island was smaller, drifting on the waves.

Otowa, the largest floating island on Japan's high marshy wetlands, contains over 200 species of vegetation

According to legend, the beautiful maiden Otowa found herself too close to a mountain forbidden to her gender. Fleeing in panic, she came to a pool where she washed the hem of her skirt and the lord of the pool fell in love with her. In a flash, the pool grew bigger, leaving only the place where Otowa was standing as a floating island.



A great snake appeared and told Otowa to remain, but Otowa wept and was allowed to return home. Three days later, however, she heard the voice of the lord of the pool calling her to return to the mountain. As she was doing so, a prince galloped up on a white horse, set Otowa in front of him, and the two disappeared in a haze. The prince was the snake-lord. For seven days, the mountain was wrapped in dew and on the seventh day the dew turned to a downpour. Heaven

and earth drew dark, meaning that the lord of the pool had gone to heaven and that Otowa was now the pool's mistress. The Otowaike Pool Festival is held on July 23 to pacify her spirit.

A myth of Okinoerabu Island likewise employs the motif of the floating island. From John Batchelor's "Items of Ainu Folk-lore," Journal of American Folklore 7:24 (1894),

How God created the Dry Land.

In the beginning the world was a great slushy quagmire. The waters were hopelessly mixed up with the earth, and nothing was to be seen but a mighty ocean of bare sloppy swamp. All the land was mixed up with and aimlessly floating about in the endless seas. All around was death and stillness. Nothing existed in this chaotic mass; nothing moved, for it was altogether incapable of sustaining life; nor were there any living fowls flying in the airy expanse above. All was cold, solitary, and desolate. However, the clouds had their thunder demons, and the Creator lived in the highest heavens with the hosts of subordinate deities.

Then the great God determined to make the earth inhabitable. He therefore made a water-wagtail and sent it down from heaven to produce the earth. When this bird saw the dreadfully shocking condition this world was in, he was almost at his wits' end to know how to perform his allotted task. He fluttered over the water with his wings, trampled upon the muddy matter with his feet, and beat it down with his tail. After a very long time of fluttering, trampling, and tail-wagging dry places appeared and the waters became the ocean. And so the worlds were gradually raised out of the waters and caused to float upon them. Therefore the Ainu call the world moshiri, "floating earth," and hold the water-wagtail in great esteem, for, was it not the angel of God?

Hawaii

Like Japan, the Hawaiian Islands are rich in floating-island mythology. We'll summarize just of few of the better-documented legends.

The Floating Island of Kane

Of the many Hawaiian tales of floating islands, the story of Kane is a favorite. To provide a sense of how the details of a plot can vary, we'll note several tellings.

Kane 1. "Legend of the Floating Island: A Kauai Version Narrated by Mrs. S. Polani of Kapaa," recorded by J. M. Lydgate in Hawaiian Annual for 1924 recalls the tale of "Ka-aina a Kane-huna-moku," the land of island-hiding-Kane.

The chief Keawe-ahu was invited to go out fishing, but when far out to sea, was tricked into jumping overboard and left to drown.

When Keawe-ahu realized what had happened he knew what it meant, and that there was no use calling to them, nor pursuing them. He turned over on his back, ceased swimming and closed his eyes to think. There was a moment of lost consciousness, and when he opened his eyes there before him was a strange, unfamiliar, beautiful land, with fertile green slopes and smiling valleys and limped flowing streams. He swam and swam, for it proved to be farther away than he first thought, but finally he reached it, and landing he saw near at hand a banana-leaf hut under a big kukui tree, in front of which sat a beautiful maiden, very charming but very petite. It was at once evident to him that she was a Menehune.

Keawe-ahu immediately saw that his superior knowledge would put him in a position of influence and importance, and this outlook, taken with the charming graces of Ana-like, reconciled him to remaining indefinitely on the island, a fate which in any case he could not escape. So he set himself assiduously to two things ; winning the favor of the maiden Ana-like, by personal attention and service, and winning the favor of the old folks and people generally by showing them how to make fire, cook food, etc.

Chapter 4 -- Look for Outriggers

Of a superior race and an al/, it is needless to say, perhaps, that he succeeded in both directions almost beyond expectations.

But though successful in his new life, Keawe-ahu yearned to return to his homeland.

This wonderful floating island was constantly shifting, mostly it drifted in shoreless seas, but sometimes it came within sight of land and several times in earlier years Keawe-ahu had seen the familiar shores of Hawaii; then he didn't want to leave, now he did.

Any day the chance might come again. And one day, sure enough it did come. In the early morning at daylight, there they were close to off the coast of Kona. There were the old familiar lava flows as bleak and bare as ever, the dark green uplands sloping up the mountains, and here and there a little curl of smoke went up, showing that there were life and people yet. It was the impulse of a moment to seize the lad, throw him across his shoulders, run down the slope and leap into the warm ocean.

It was a long hard swim, but was he not a master swimmer, and had he not, secretly, been training for just this kind of feat? However that may be, they reached the shore safely, though very much exhausted.

"Can You Keep a Secret?" in Tales of the Menehune (1960), by Mary Kawena Pukui and Caroline Curtis, if from an old man whose mother came from Puna.

Poko was fishing with Grandfather. They had come out at dawn, and the boy had watched the daylight grow. Ocean and sky were pink like a pearl shell, all but one low gray cloud-a low gray cloud that rested on the waves. We'll shorten the telling.

They paddled toward the cloud, and it rose slowly, uncovering an island. This island was more green and beautiful than anything the boy had ever seen, and it was filled with growing things. Tall coco palms were heavy with ripe nuts, bananas shone like the sun itself, plants, vines, and trees were large and very green. Suddenly a cock crowed, and the cloud settled down once more upon the island.

"Grandfather!" the boy whispered. "What is that land? Let us go there!"

"It is one of the hidden islands of Kane, and we cannot go to it."

"Why not, Grandfather? Didn't you see how green and beautiful it is? I want to go there. I want to see it all. Come, Grandfather, let us go."

"Grandson," the old man answered solemnly, "this I have heard: If the gods move that land close to the homes of men, then one can reach it in an hour. But often the land is hidden, and one may sail the ocean until he is gray-headed and never find it. Today the gods gave us sight of that fair land, and then they hid it. It is gone from us forever." The boy said no more, but his heart was filled with longing.

Poko became a man, married, and had a fine family whom he loved. Still the thought of that beautiful green island stayed with him. Still he longed to go there.

Today he and his family were in Puna visiting relatives. His wife and her cousins talked together of kapa-making and other women's matters. Tired of listening, Poko wandered off along the beach. He found a shady spot and sat down to rest. He leaned against a rock and dreamily watched a log rolling in the surf. Up the beach it came, pushed by the waves, then down again. As he watched, Poko thought again of the hidden island. If only he might go there! Perhaps he slept.

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Suddenly he was roused by a hand upon his shoulder. He sprang up and looked into the face of a woman he had never seen before. Her pa-'u was of dark seaweed, her lei and bracelets were of shells. "You dream of the hidden island of Kane," she said, and her voice was like the song of pebbles washed by the waves. "I am the daughter of Kane. I will take you to that hidden land. Come with me."

We'll not give away the ending, letting the illustration speak for itself.



*"You May Land,"
said the Daughter of Kane*

Rerioterai Tava and Moses Keale's Niihau: The Traditions of an Hawaiian Island (1989) notes some Niihau traditions regarding the floating island,

One of the most persistent mysteries of Niihau to this day is the legend of the huna motu—the mysterious islands that have been occasionally sighted by islanders and outsiders. In fact, the first recorded sighting of these "disappearing islands" was by Captain James Cook in 1778, who wrote that he could see Oahu to the east and over to the southwest another island, small and uninhabited. He called these islands Moodoopapapa. He returned to the seas of Niihau twice to find the elusive and mysterious turtle islands but was never successful in sighting them again.

The Niihau people of old knew of these islands, as they were used as points of reference during the many travels back and forth to Tahiti. They are included in many chants and legends and have been documented in historic times by others in addition to Cook. In his study of the geology of Niihau, scientist Norman Hinds reported that three miles northwest of Kaula was a rocky pinnacle that stood thirty-eight feet above the ocean surface. Niihauan Keola Kauileilehua Keamoai was eyewitness to a floating island. Perhaps the islands are what Hawaiian mythologist Martha Beckwith speaks of as the twelve sacred islands of Kane.

One of these huna motu is known as Unulani.

Kahikipapaialewa, Kanehunamotu and Kuaihelani are three other islands that float in the ocean and appear just before the break of dawn on the eastern side of Niihau. They were always seen on kapu days. They were very lush—trees laden with fruits, the surrounding ocean full of fish, and everything plentiful. It is said that only the spiritual believers can see these islands. It is also believed that they are the path to Kahiki, land of the gods. If the gods permit the islands to move close, then it will only take an hour to reach them. If the gods don't see fit to let them to get close, one could sail the ocean and never find them. They are seen at sunrise and sunset.

From Hawaiian Mythology (1940) by Martha Warren Beckwith,

Today they are called the "lost islands" or "islands hidden by the gods." At sunrise or sunset they may still be seen on the distant horizon, sometimes touched with a reddish light. They may lie under the sea or upon its surface, approach close to hand or be raised and float in the air according to the will of the gods.

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The land of Kane-huna-moku (Hidden land of Kane) is one of these islands. Here live Kane and Kanaloa with other spirits who are Kane's direct descendants... It is a middle land between heaven and earth where spirits enjoy all the delights of earth without labor and without death, and in extreme old age return to earth, either in the bodies of men or as spirits, or become gods and live in the clouds.

Patrick Nunn's Vanished Islands and Hidden Continents of the Pacific (2008),

A literal belief in the periodic reappearance of Kane-huna-moku has many parallels with those of the Fiji island named Burotu. In the early decades of the twentieth century, a family living at Haria on Maui Island predicted that on a particular day Kane-huna-moku would pass by and carry them away; strange shapes in the clouds seemed to presage the island's appearance but nothing happened.

Another account from Ka'u on Hawaii Island tells that when Kane-huna-moku passed by, it was possible to hear cocks crowing and pigs grunting on the island, to see lights flickering and people moving about. And on another occasion, two fishermen from Pu'uloa were blown to Kane-huna-moku and brought breadfruit back to the Hawaiian Islands.

It appears that Kane-huna-moku has been seen in many places within the Hawaiian Islands and beyond, which suggests that many instances of coastal submergence in these islands may have been enshrined in oral traditions, sometimes by modifying existing stories. For example, the occasional reappearances of Kane-huna-moku in Hawai'i may be the outcome of a mirage or the appearance of a pumice mat, combined with a perceived need to reinforce some element of tradition.

Legends persist for their mythological value, not necessarily their credibility. Our Kabe tale, however, garnered local belief until the not-so-distant past, as evidenced by "Natives Believe Dream Is Certain to Come True," San Francisco Call, November 27, 1904.

There is a weird story from the island of Maui. Living at Hana is a native family named Kilinahe. The family was quite well to do until a short time ago, when the elder member of the family dreamed that his dead child appeared and told him that on November 28, a floating island would appear at Hana for them and they must be ready to leave their homes and go on the floating island. The child announced that he would be on a rainbow which would connect the Hana point with the island. He would guide them along the rainbow, to the new land.

So impressed was the elder Kilinahe with the story that he told his family, and all agreed to prepare for the arrival of the island. The family has been disposing of their property ever since and the family home has been turned into a church. The bones of the child were disinterred, for according to the dream the child would come to life again and meet the family when the island came. After getting on the island all the family will float away into the sea and live in peace and plenty. A number of other natives in the Hana neighborhood are trying to sell out in order to get stock in the new colony. Kane-huna-moku is the name of the island.

The People of the Sea: Environment, Identity, and History in Oceania (2006) by Paul D'Arcy,

One must take care to distinguish different types of islands in traditions and legends. Some were spirit isles that existed in a parallel dimension as the home of spirits and the parallel dimension of souls. On occasion they were visible to humans, who were rarely able to reach them. The legend of Kane-huna-moku (Kane's hidden land) tells how Kane was banished to a floating land inhabited by dwarfs, for desecrating a garden. He was informed that his land was sacred and could only be seen by humans during certain kapu periods in July and August, when it was seen to hover near Haena on Kauai. At this time, it was near the floating island of Kaonohlula, a beautiful residence of Kane and Kanaloa. Floating Islands moved on the wind at night." Perhaps the most famous in Hawaiian legend was Paliuli, the paradise of the gods, which floated above the clouds or rested upon the earth at the will of its keeper. In ancient times it was associated with the deep seas, but later it was identified with an area of upland forest between Hilo and Puna on Hawaii. A mortal, Nauahi of Hilo, once chanced upon Paliuli,

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but when she brought others back to see it the gods hid it." Kuaihelani (supporting heaven) was the land most often mentioned in legends about visits to the heavens or to lands distant from Hawaii. It lay 40 days sailing west of Hawaii, where the sun set into the deep blue sea, but in another dimension."

Haupu Hill

"The Hinas of Hawaiian Folk-Lore," Thrum's Hawaiian Annual 47 (1917) by Thomas Thrum, cites Abraham Fornander's An Account of the Polynesian Race (1878-1885) for the tale of Haupu hill floating from Molokai to Maui and back.

In the Legend of Kana and Niheu, with earmarks of great antiquity and such popularity as to be known by several versions, Hina as the mother of these demigods and wife of Hakalanileo is met with, living at Hilo, where, in the exercise of that natural feminine trait, curiosity, she climbed Haupu hill that had drifted thither from Molokai with its chief, Kapepee, and his high priest, to view its attractions, whereupon it drifted back to its position off the north coast in Pelekunu district of Molokai. Thus was Hina abducted.

A different reference to the hill's floating is found in "Hawaiian Romance of Laieikawi," Annual Reports, American Ethnology Bureau 33 (1919)

The firstborn of Hakalanileo and Hina is born in the form of a rope at Hamakualoa, Maui, in the house Halauooloo, and brought up by his grandmother, Uli, at Piihonua, Hilo. He grows so long that the house has to be lengthened from mountain to sea to hold him. When the bold Kapepeekauila, who lives on the strong fortress of Haupu, Molokai, carries away Hina on his floating hill, Haka lanileo seeks first his younger son, Niheu, the trickster, then his terrible son Kana, to beseech their aid in recovering her.

The Rolling Island of Ulu-ka-a

"The Rolling Island," Legends of Hawaii (1937) by Padraic Colum tells of a Hawaiian king, abandoned at sea, awakes on a magical floating island of Ulu-ka-a where he marries. Later he returns to Hawaii; his son visits him, and then his wife; and finally they return to the floating island.

There are islands that appear and disappear, not because they rise up from the depths of the ocean and sink down again, but because they are rolled here and there by one or another of the gods. They are sacred islands and it is unlucky to point to them, unlucky to look long at them when they appear. One is tinged with red: it can be seen only in the sunrise or the sunset. The Hawaiians before they turn their heads away say its name: it is Ulu-ka-a, the Rolling Island.

He wept for his fate. He ceased to swim and let himself float on the water. The canoe of the faithless fishermen was now out of sight and he thought there was no hope for him. But as he floated a rainbow bent above him and a reddish glow shone around him. And this was because he was a Chief of high rank, a descendant of the Heavenly Ones.

Ku, in the Country that Supports the Heavens, looking down on the ocean, saw the rainbow and the reddish glow and knew that a mortal who was a descendant of the Heavenly Ones was abandoned there. "This one," he said, "would be a fitting husband for my grandchild A-ne-li-ke who is on Ulu-ka-a with women attendants who have never seen a man. I will roll the island toward this chief. He will go on it and be saved; my favorite grandchild will find him there."

Then Ka-ewe-aoho, already spent, heard waves breaking on a land. Just as his strength was failing utterly a breaker rolled him upon the soft sand.

When it was daylight he went across the land and saw that it was an island shaped like a breadfruit. And although there were no cultivated patches to be seen there was food growing on the island. He saw a banana tree with bunches of ripened fruit. He went to it, plucked and began to eat the fruit.

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He marries A-ne-li-ke, but yearns to return to Hawaii, his homeland

A-ne-li-ke and Ka-ewe-aoho went down to it and took farewell of each other there. The canoe was red, with red mast and red ropes and red sails, and those who manned it were all in red.

And when he went into the canoe she warned him not to look back: he was to take no glimpse of Ulu-ka-a once his canoe started for Hawaii. He stood with his back to the Rolling Island until, at sunset, the canoe came to Hawaii.

And skipping to the end,

Said Eyebrows-burnt-off to his father. "My mother means to try if your love for her has lasted. If she finds it has not she will strike you dead. Each of Ku's grandchildren will come to you, and if you are not able to distinguish A-ne-li-ke amongst them you will live no longer than today.. And if you are able to know A-ne-li-ke from the others you will live to go with her back to Ulu-ka-a, the Rolling Island."

A woman came before him and when he looked on her he knew that she was A-ne-li-ke. He wept and she went and sat upon his lap. "Your life is spared," she said.

Then a day came when A-ne-li-ke told her husband that they should go to her own island. Ka-ewe-aoho then gave the chiefship to his son, and going in the great canoe sailed away with Ku's grandchildren, eleven of whom kept their faces hidden from him. They came to Ulu-ka-a, the Rolling Island; then each of the eleven went to her own island. And as for A-ne-li-ke, she and her Man-from-the-Sea lived in peace for many years.

Another account of the island's rolling, this one from William Rice "Ulukaa, the Rolling Island," Hawaiian Legends (1923),

As Kaeweaooho was swimming, Kuwahailo, grandfather of Kaanaelike, queen of Ulukaa, looked down from the sky and seeing the high chief signs hovering over a swimmer knew that the man must be a very high chief or a king who would make a suitable husband for his favorite granddaughter, who lived on the rolling island of Ulukaa. So he decided to save the swimmer.

At once a great storm arose on the sea, and Kuwahailo moved the rolling island close to the young king. Kaeweaooho was alarmed when he heard the big waves breaking on the land. He thought it was the big fish coming to devour him. Just as his strength was failing a breaker rolled him upon the soft sand, where he lay as one dead.

The Return of Rono

While Jules Verne is best known for his quasi-scientific adventure fiction, the writer was also somewhat of an ethno-historian. A Hawaiian myth, "Captain Cook's Third Voyage," from his Celebrated Travels and Travelers. The Great Navigators of the Eighteenth Century (1870).

A certain Rono, who lived under one of the ancient kings of Hawaii, had killed his wife, whom he tenderly loved, in a transport of jealousy. The grief and sorrow which followed upon his act, drove him mad; he ran about the island, quarrelling with, and striking everybody. At last, tired out, but not satiated, with murder, he embarked, promising to return one day, upon a floating island, bringing cocoa-nuts, pigs, and dogs.

This legend had been embodied in a national song, and became an article of faith with the priests, who added Rono to their list of deities. Confident in the fulfilment of the prediction, they awaited his coming every year, with a patience which nothing could exhaust.

We'll have more to say about Captain Cook in Chapter 47.

The Floating Isle of Listener-to-the-Heavenly-Voice

Wheeler, Post, "Flash-of-the-Paddle and Listener-to-the-Heavenly-Voice," Hawaiian Wonder Tales (1953) a divine princess lives on a magical floating island. A brief portion,

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In the very ancient days- soon after our ancestors came from their first home in the west that is called Helani-the-Distant, the Land-that-Supports-the-Heavens, to this Hawaii of the dotted seas- that kingdom was ruled by a king who had eight daughters. In feature they were as like to one another as pandanus-seeds, and all were slim and delicate as flowers; but the youngest, whose name was Haka-Lani-Leo, which in the ancient tongue meant Listener-to-the-Heavenly-Voice, was so beautiful that her nurse covered her face with a veil to hide her loveliness.

There was bur one way by which a man of the Lower Islands might reach the Upper-Outer-Kingdom, At one place, where its rim rested on a high peak that lifted from the shore of one of the islands, a gigantic vine drooped from it, down the face of the mountain, and its tendrils had rooted in the Earth below.

When Listener-to-the-Heavenly-Voice was sixteen she learned of the great vine, and at once fell to coaxing her father to allow her to descend it and thus visit the world of the Lower Islands.

After pondering the matter, the Counselor said, "By thy magic make for her a floating island which will carry her where she wills, and I myself will accompany her. She will soon tire of the plaything and be content to remain in thy kingdom." Accordingly the King made ready the island, and magicked it so that it would sail, like a great canoe, wherever she bade it. It had groves of flowering shade trees wherein roosted violet and emerald birds-of-paradise, with tails like yellow waterfalls. It had springs of sweet water and all kinds of fruits and vegetables.



The Floating Island Was Ready

Kuaihelani

When the modern Hawaiians arrived, the diminutive Menehune and the Muaimaia ("banana eaters") could not coexist with the newcomers and left on a floating island called Kuaihelani, the Hawaiian route to paradise. Departed souls walk the rainbow path passing through Kuaihelani to reach the bright, elevated and fragrant sacred land of Nu'umealani.

From Katharine Luomala's "Legend and Song," A Hawaii Anthology (1997) Joseph Stanton, ed.,

Kuaihelani is a beautiful and mysterious floating island that is often mentioned in Hawaiian narratives. Old accounts state that it floats about in the mythological region called Kahiki. However, in historic times it has apparently extended its route to float around the Hawaiian Islands, for a Hawaiian occasionally reports having seen it drift past his home at night, like a great ocean steamer.

The Menehune of Polynesia and Other Mythical Little People of Oceania (1951) by the same author contains the following references.

Analike, one of the few Menehune females ever mentioned in stories, was a girl who lived on an island that floated about the Pacific and who is described as beautiful and very petite.

A romantic story has the Menehune and the Mu, a people sometimes said to be their relatives, living on a beautiful floating island which anchors near Kauai. Huluknmanuna, a famous jumping kahuna endowed with great foresight, declared to King Kikiaola that only the Menehune could build a dam at Waimea. He received his wisdom about the Menehune from the god Kane, who told him to go to Kanehunamoku, chief of the floating island, bearing his name or that of Kueihelani, and ask for Menehune aid.

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The narrator then describes the culture of these people, but I shall break off and insert a section about the history of the Mu as told briefly in the story. They were kidnapped by Kalaulehua, a Kauai man, from Kanehunamoku, the chief of the famous floating island bearing his name or that of Kuaihelani.

After acting as a very lucky fish-watcher for some of the people below who admire his skill and his chanting, he is visited by a kahuna whose secret knowledge is of the Mu's need for him, He is a relative of the Mu, and has come from the floating island to serve a Kauai chief at the request of the god Kane.

[He] has come from the floating island to serve a Kauai chief at the request of the god Kane. The fish-watcher has enormous strength, for he can carry in one bundle what 8 times 40,400 men can carry.

[He] sees Kanehunamoku near Kaauhau Point and goes aboard the floating island, where he is recognized as a relative and given great mana. He returns to Laau to discuss with the other Mu plans for returning to the floating island. When they go aboard, all except the reader of omens, who is last aboard, are sent into quarantine to a sheltered side of the island for ritual purification before rejoining their fellow travelers on the floating island.

The Floating Hill of Kahuku

The northern tip of Oahu, Kahuku -- the red circle -- is said to have floated to the larger island, where it then become fastened.



"Cultural Resources, Kahuku area general," Final Environmental Impact Statement, Impacts of the proposed Army Transformation of the 2nd Brigade, 25th Infantry Division (Light), to a Stryker Brigade Combat Team (2004) catalogs some of the lore.

The island of Kahuku, floating, banged against the shore of Oahu, creating a lot of noise. Then the old women guarding Princess Laiekawai ... grappled the island with fishhooks and attached it securely to Oahu. Polou Pool on the sea side of the Kahuku Mill is one spot where the hook was fastened. The other end was fastened at Kukio Pond, 300 feet inland at Kahuku Point.

Kahuku, at the point it was still a separate, floating island, was inhabited by menehune [dwarfs]. The island did not have fresh water, so the menehune had to collect water from Oahu, for which they had to paddle their island up to the Oahu shore. Eventually, a man from Kahuku suggested that everyone make whalebone hooks, attach them to olona rope, and capture the island. The Kahuku people did this and the menehune were unable to free their island.

The proverb "Kahuku 'aina lewa" means "Kahuku, an unstable land"; Oahu was once two islands and Kahuku is the part that bridges the gap.

"Polou, perhaps a shortening of Poulou (hooked post)" in legend was once two islands ruled by a brother and sister who locked hands to pull the islands together. They did this at a pool (Pukui).

In "Archaeology of Oahu," Bernice P Bishop Museum Bulletin 104 (1933), J. Gilbert McAllister suggests where to seek evidence.

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Polou, formerly a pool of water, sea side of the Kahuku mill. A story is told that Kahuku was once a land afloat, wafted about by the winds, drifting over the ocean. Just how it came to Oahu is not told, but old Hawaiians point out Palau, the place where Kahuku is fastened to Oahu. Formerly it was possible to dive into the pool and when a depth of 40 fathoms was reached, a shelf of rock was found upon which to rest. Forty fathoms deeper Punakea (white line from coral) was reached and on looking toward Malaekahana, the hook by which Kahuku was made fast could be seen.

Modern Times

Island folklore isn't necessarily past tense.

A floating collection of trash the size of Texas has been reported since 1996 to be circulating in the North Pacific Subtropical Gyre between the west coast of the United States and Hawaii. While the 3,000,000 tons of manmade debris is spread too thinly to constitute an island, it remains an ecological and potentially a navigational hazard.



To us, it's another urban legend, but to folklorists of the future, it's publishable.

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CHAPTER 5

ASK A NATIVE AMERICAN



With each Native American group, we've included a geographic reference to modern Canada or the United States, but recognize that many tribes now reside in other than their ancestral homeland.

Cosmology

We'll begin with an explanation from the Queen Charlotte Islands of how the Earth came to be, as recorded by John Swanton in "Contributions to the Ethnology of the Haida," Memoirs of the American Museum of Natural History 8 (1905).

Once a man went out hunting. On the way he saw a canoe-load of people paddling about in the air. They pursued him, and he took refuge behind a tree. They came around the tree, and he fled to another. After he had done this many times, he became tired, and, when they got over him, pressed the end of his bow against the bottom of their canoe and upset it. Then the canoe people struggled about in the air as if it were water for a time, and finally sank out of sight.

Their bailer floated up into the sky and became the Pleiades, the board on which skins were stretched became the bowl of the Great Dipper, and their roasting-stick became another constellation [perhaps the belt of Orion].

Beneath the firmament stretches an expanse of sea upon which two islands are floating, - Inland-Country or Haida-Land, and Seaward-Country or Mainland. There seems to be a notion that the surface of this sea rises gradually towards their own country. The firmament rises and falls at regular intervals; and the clouds, which strike against the mountains in consequence, produce a noise. It may be distinctly heard, but is quite different from thunder. Although said to float, the Haida country, at least, has a firmer foundation in the shape of a great supernatural being called Sacred-One-standing-and moving. He, in turn, rests upon a copper box, but what supports that they do not say. Neither do they attempt to explain how Mainland is supported, apparently because that knowledge is the business of mainland people.

The Creation of People

Native Americans from many regions include a floating island in their account of how they, as a people, came into existence.

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A myth of the Okanagan tribe along the western United States/Canadian border tells that the first people lived on an island in the middle of the ocean. From Hubert Bancroft's Native Races of the Pacific States (1874),

The Okanagans have a god, Skyappe, and also one called Chacha, who appear to be endowed with omniscience; but their principal divinity is their great mythical ruler and heroine, Scomalt. Long ago, when the sun was no bigger than a star, this strong medicine-woman ruled over what appears to have now become a lost island. At last the peace of the island was destroyed by war, and the noise of battle was heard, with which Scomalt was exceeding wrath, whereupon she rose up in her might and drove her rebellious subjects to one end of the island, and broke off the piece of land on which they were huddled and pushed it out to sea, to drift whither it would. This floating island was tossed to and fro and buffeted by the winds till all but two died. A man and woman escaped in a canoe, and arrived on the mainland, and from these the Okanagans are descended.

As recorded by Alexander Ross in Adventures of the First Settlers on the Oregon or Columbia River (1849),

Long ago, when the sun was young, to use their own expression, and not bigger than a star, there was an island far off in the middle of the ocean, called Samah-tuma-whoolah, or White Man's Island. The island was full of inhabitants of gigantic stature, and very white, and it was governed by a tall white woman, called Scomalt. The good woman Scomalt, possessing the attributes of a deity, could create whatever she pleased. The white people on this island quarreled among themselves, and many were killed in the affair, which conduct so enraged Scomalt that she drove all the wicked to one end of the island, then broke off the part on which they stood, and pushed it adrift to the mercy of the winds and waves.

There they floated about for a length of time, not knowing whither they went. They were tossed about on the face of the deep till all died but one man and woman, and this couple finding the island beginning to sink with them made a canoe, and paddling for many days and nights, going in a westerly direction, they came to a group of islands, and kept steering through them till they made the main land -- the land which they now inhabit -- but they say that it has grown much larger since that time. This couple, when first expelled from the island of their forefathers, were very white, like the other inhabitants of the island; but they suffered so much while floating on the ocean that they became dark and dingy from the exposure, and their skins have retained that color ever since. From this man and woman all the Indians of the continent have their origin and as a punishment for their original wickedness, they were condemned by the great Scomalt to poverty, degradation, and nakedness, and to be called Skyloo, or Indians.

C.S. Boswell's "Myths of the Great Departed.: A Study in Legendary Folk-Lore," The Eclectic Magazine of Foreign Literature, January 1890, relates to the Algonquins.

In the more northern part of the American continent, it is said that Glooskap, the chief divinity of the Algonquin tribes of Maine and New Brunswick, was miraculously born "in the land of the Wabanahi, which is next to sunrise." Thence he came to America in a stone canoe or floating island, and created men and animals, or-dispelled the physical and mental darkness which prevailed before his arrival. This darkness must have been very dense, for an Indian pathetically relates, "It was so dark that they could not even see to slay their enemies," a state of things almost as bad as that prevailing in Chaos, when, if we may believe Hans Sachs, it was so dark that the very cats would run up against each other. Glooskap taught men to hunt and fish, to build huts, canoes and weirs, and to make nets and weapons. He also taught them the names of plants and animals, and which were fit for the use of man, and the names of the stars.

Chapter 5 -- Ask a Native American

In Myths and Myth Makers (1896), by John Fiske, poetically describes Michabo, the Indian solar deity, whom the Algonquins knew as the Great Hare.

From a grain of sand brought from the bottom of the primeval ocean he fashioned the habitable land, and set it floating on the waters till it grew to such a size that a strong young wolf running constantly died of old age ere he reached its limits.

Report of the New York State Museum 62:3 (1909) deals with the Iroquois.

In the faraway days of this floating island there grew one stately tree that branched beyond the range of vision. Perpetually laden with fruit and blossoms, the air was fragrant with its perfume, and the people gathered to its shade where councils were held.

One day the Great Ruler said to his people:

We will make a new place where another people may grow. Under our council tree is a great cloud sea which calls for our help. It is lonesome. It knows no rest and calls for light. We will talk to it. The roots of our council tree point to it and will show the way.

Seneca Myths and Folk Tales (1923) by Arthur Parker relates the cosmologic myth as told by Esquire Johnson, a Seneca of New York in 1870.

There was a vast expanse of water. Above it was the great blue arch of au' but no signs of anything solid-. In the clear sky was an unseen floating island sufficiently firm to allow trees to grow upon it, and there were men-beings there. There was one great chief there who gave the law to all the Ongweh or beings on the island. In the center of the island there grew a tree so tall that no one of the beings who lived there could see its top. On its branches flowers and fruit hung all the year round. The beings who lived on the island used to come to the tree and eat the fruit and smell the sweet perfume of the Bowers.

The story continues with the usual description of how the sky-mother was pushed into the hole in the sky and fell upon the wings of the waterfowl who placed her on the turtle's back. Chapter 7 contains more Native American lore related to turtles.

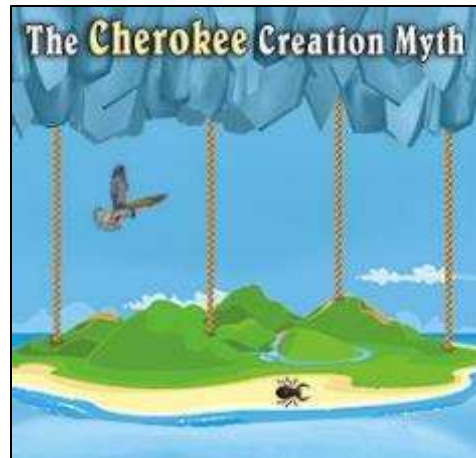
The Cherokee creation story, somewhat obligatory in popular books of mythology, speaks of the Earth being a great island floating in the sea. From "How the World Was Made," Myths and Legends of the Great Plains (1913) by Katharine Judson,

The earth is a great floating island in a sea of water. At each of the four corners there is a cord hanging down from the sky. The sky is of solid rock. When the world grows old and worn out, the cords will break, and then the earth will sink down into the ocean. Everything will be water again. All the people will be dead. The Indians are much afraid of this.

Another version, one of many such "earth-diver" accounts, "Creation of the Earth Along with the Five Civilized Tribes, Myths of the Cherokee (1900) by James Mooney,

The earth is a great island floating in a sea of water, and suspended at each of the four cardinal points by a cord hanging down from the sky vault, which is of solid rock. When the world grows old and worn out, the people will die and the cords will break and let the earth sink down into the ocean, and all will be water again. The Indians are afraid of this.

When all was water, the animals were above in Galun'lati, beyond the arch; but it was very much crowded, and they were wanting more room. They wondered what was below the water, and at last Dayu-ni'si, "Beaver's Grandchild," the little Water-beetle, offered to go and see if it could learn. It darted in every direction over the surface of the water, but could find no firm place to rest.



Then it dived to the bottom and came up with some soft mud, which began to grow and spread on every side until it became the island which we call the earth. It was afterward fastened to the sky with four cords, but no one remembers who did this.

"The First World," Navajo History (1971). Ethelou Yazzie

The First World was small in size and was much like a floating island in a sea of water mist. In the east, where the white cloud and the black cloud met, Altse Hastiin (First Man) was formed. With him was formed the white' corn which was perfect in shape, with kernels covering the whole ear. Doo Honoot'inii is the name of this first seed corn, and it is also the name of the place where the white cloud and the black cloud met.

Saga

"Fond-of- Travelling, Seventh-Son, and the Land of Spirits Clad in White," in "Penobscot Tales and Religious Beliefs," Journal of American Folklore 48:187 (1935) by Frank Speck recounts an adventure in which the hero is transported to a magical realm by a floating bog, perhaps in Maine.

At last he saw a lake. He travelled and came to the head of the lake. Looking he saw another lake, a very nice looking lake and he also saw many beasts. He said, "I have found a fine camp ground."

Then he travelled until almost night and looking ahead of where he was going he saw an opening of a fine appearance.

Then he went to investigate it. When he got there he looked and saw a bog floating. He was astonished. He could nowhere see land and he was astonished. Then he went out into it and while standing there all of a sudden a terrible wind came.

He thought, "Whatever shall I do so that I can get back where I came from? I have been blown very far across this floating bog."

While sitting there thinking he looked suddenly and saw a marked tree. He went and saw a blazed trail.

Then he followed it and came out into a big path.

Then he followed it. At last he saw a hill before him and a village surrounded by high walls. He saw houses, some of them rising above the stockade.

Geological Process

Billie Kim, "Legend of the Floating Hill," American Indian 2:4 (January 1928), perhaps a myth in the telling, but an unexaggerated observation of the ravages of the Mississippi,

Many years before the long arm of civilization reaching out across the Eastern border of the red man's land, sought to grasp and hold the giant strength of the Great Father of Waters, there came a great flood.

The melting snows of winter and the continuous rains of spring combining in one great torrent, rushed southward whirling around tall trees of the forest, darting under stone bluffs, undermining high banks and cutting level lands into deep ditches and ravines.

Faced with starvation, the Great Chief with bow and arrow, climbed a high cliff, hunting game for food. Reaching the top of the cliff and looking across the river, the Chief saw what appeared to be tall trees in motion. At first, judging it to be the delusion of moving water, he watched, but to his astonishment, found that a high hill beyond was actually moving.

According to tradition, the Black Hawks rushing to the cliff and looking across the river, saw the hill slide off and float away on the current of the Great Father of Water. And the great overflow from the river, whirling into the deep recess left by the uprooted hill, spread out into a smooth lake of water.

In her review of The Dawn of the World: Myths and Tales of the Miwok Indians of California (1910) by C. Hart Merriam, College English, April 1994, Helen Jaskoski contrasts Miwok lore to the modern understanding of continental deformation, in her terms, that of a "floating island."

The ubiquitous Coyote plays a major role, of course. In a creation story from the Point Reyes peninsula just north of San Francisco. Coyote sails up to the northern coast, then fastens his raft and stretches it out to produce his territory. Geologically, the Point Reyes peninsula is a land raft, a floating island that migrated northward through the Pacific and attached to the continent at the San Andreas fault; it continues to move north a few inches every year. Such intimate understanding of the environment is characteristic of stories in all the traditional texts reviewed here.

Jaskoski's floating-island explanation is as geologically erroneous as the one involving Coyote. Point Reyes' migration is a consequence of tectonic subduction, not buoyancy. Sensing that the landform had moved, the Miwok looked to animistic myth. We're prone to simply substitute a later myth.

Expropriation

It's the nature of mythology to resurrect itself, and not always does the reincarnation replicate the story told before.

In 1609, French explorer Samuel de Champlain encountered lake to be named after him. The tercentenary celebration of that discovery was graced by President Taft, the British and French ambassadors to the United States, Native Americans, and -- need we be surprised, a floating island.

The floating island, lit with electric lights from an on-board generator, was towed before the grandstand, seating over 5,000.

"Floating Island and Other Scenes of the Historic Champlain Celebration," Los Angeles Herald, June 27, 1909, catches the flavor.

Champlain is to have a new island, a temporary floating one. It is being made of large barges, fastened together and covered with a thick layer of soil, in which small trees will be planted. The grass and the rocks will be added. On it will be Indian camps, and upon its beach will be drawn up the canoes of the aborigines. The island will appear first at Ticonderoga, and later will be towed to Crown Point. One of the episodes which will be represented in this setting will be the

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encounter of Champlain with the Iroquois. The 150 Indians who have been engaged from Canada will also enact their version of the Indian myth which Longfellow embodied in his "Song of Hiawatha."

"Pontifical Biblical Institute Is Founded," San Francisco Call, July 4, 1909,

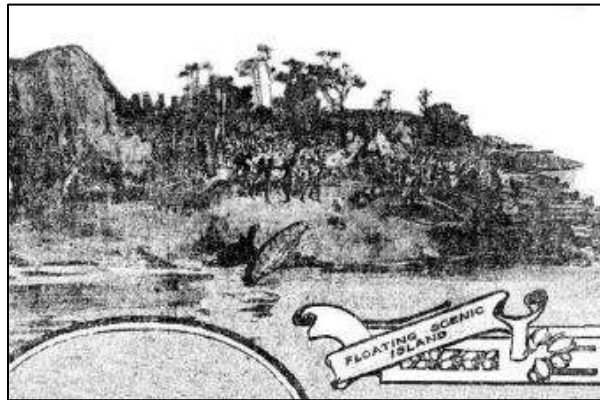
Thursday, July 8, the play "Hiawatha" will be given by 175 Algonquin- Indians from Quebec. The stage for this play will be a floating island. There will be a pageant of historic floats along shore. A reception is being arranged in honor of Vice President Sherman, which will be attended by several hundred prominent Catholic laymen of the state.

"The Floating 'Island' on Lake Champlain," New York Tribune, July 7, 1909

On this artificial landing stage supported by boats, Indians gave their Interpretation of "Hiawatha" and reproduced scenes from Indian life.



Sketch from the Los Angeles Herald, June 29, 1909, showing the Indians welcoming Champlain. Although the celebration was at Burlington, Vermont, the natives were hired from Canada.



Fridtjof Nansen's In Northern Mists, Arctic Exploration in Early Times (1911) contains an entry that seems to link two seemingly non related traditions.

At Boston, in America, there is found a myth of an enchanted green land out in the sea to the east; it flies when one approaches, and no white man can reach this island, which is called "the island that flies." An Indian, the last of his tribe, saw it a few times before his death, and set out in his canoe to row, as he said, to the isle of happy spirits. He disappeared in a storm the like of which had never been known, and after this the enchanted island was never seen again.

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An enchanted island floating east of Boston -- an city of Irish Americans -- would be west of the old country and thus can be no other than St. Brendan's (Chapter 3, Seek a Saint). The old Indian, on the other hand, would seem to pertain to Chapter 5, Ask a Native American. Does what seems to be a shared knowledge of this "island that flies" corroborate the legend of the Welch noble Madoc sailing to America in 1170 and the report that four centuries later, European settling along the James River found the locals speaking Welch?



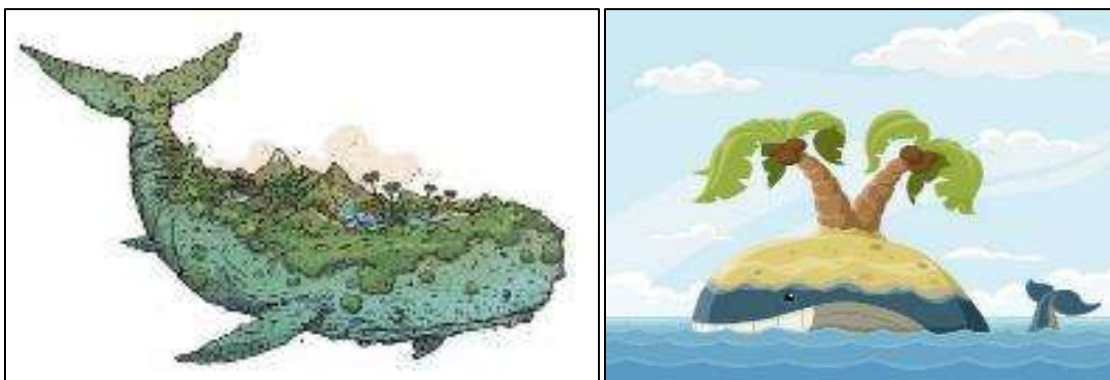
A floating island may thus be the evidence needed to solve the long-debated question of Native American origin.

We'll return to the Native American lore regarding the Great Flood in Chapter 5 and the arrival of the Europeans in Chapter 47.

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CHAPTER 6

ASSURE THAT THE ISLAND'S NOT A WHALE



Whales, turtles and other sea creatures large enough to be mistaken for islands regularly surface in folk tales. The creature is often so large and ancient that vegetation grows on its back, sometimes fooling the hero into scrambling ashore. There may be opportunity to marvel at its existence before the island decides to dive.

The whale-as-an-island, also known as a "zaratan" or "aspidochelone," is a common chapter in seafaring folklore.

An early report of a whale imagined to be a floating island from Ambrose's Hexameron (latter 4th century),

The whale is a fish of enormous bulk, which you would imagine to be a floating island on the occasions when it swims above the surface, and that the summits of its lofty mountains touch the heavens. They report that it is not seen along shores and strands, but in mid-Atlantic. Sailors, catching sight of it, lose confidence and, withdrawing from their bold navigation of those waters, will not venture to explore the mysteries of the elements for fear of meeting their deaths.

From Thomas Herbert's Some Years Travels into Africa and Asia the Great (1638),

I remember that all the way we sailed 'twixt the last isle and the bay we anchored at we were disported by whales, who, in wantonness fuzzing the briny ocean out of those pipes or vents nature has placed upon their shoulders, like so many floating islands accompanied us.

From Paradise Lost (1667) by John Milton,

*That Sea-beast
Leviathan, which God of all his works
Created hugest that swim th' Ocean stream:
Him haply slumbring on the Norway foam
The Pilot of some small night-founder'd Skiff,
Deeming some Island, oft, as Sea-men tell,
With fixed Anchor in his skaly rind
Moors by his side under the Lee,*

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The greatest whale tale, however, better than Moby Dick, is that St. Brendan, but as we've visited his isle in Ch. 3, Seek a Saint, we needn't return.

"Of the Universe as Considered Under a General View," The Lady's Museum (1760), by Charlotte Lennox,

Within its bulk of waters myriads of animals of various forms and sizes find habitation and existence, from the immense floating island of the whale's enormous body and the devouring shark, to the poor little lifeless limpet, which fixes to the rock, and there passes all the period of its being without either sight or motion

"Story of the Lady of the Beautiful Tresses," Tales of the East (1812) by H. Weber,

Young daughter of the sea, (for such you are from your appearance,) canst thou tell us by what means the knight who has sent you proposes to arrive on our island? He cannot come ashore on his floating island without overwhelming our harbor.

What you take for an island, answered Ilzaide, is a monstrous whale, which I saw him destroy, and on the back of which my two sisters and I mounted along with him. He told us that the enormous monster was the queen's greatest enemy, and he wished to pre sent him to her.

"The Great Sea-Serpent. A New Wonder Story," Scribner's, January 1872, by Hans Christian Andersen,

But then there came right in their way a great monster, bigger than all of them put together; it looked like a floating island that could not stop itself. It was a venerable whale. Its head was grown over with sea-weed, its back covered with barnacles, and such innumerable oysters and mussels, that its black skin was altogether whitened.

"The Harnessed Whale," New York Sun, July 19, 1880,

The captain called the watch up, and a couple of boats started for the whales, which were lying still, as if sunning themselves. We raced with the other boat and got ahead, for my men were lithe and tough, and by and by we got alongside of one of the big fellows. The steering oar was pulled up, the oars were packed -- that is, packed in so that they couldn't strike the water-- then an iron was thrown into the floating island.

"A Munchausen Whale Story," Forest and Stream, December 7, 1882, by Edward Manning,

Well, at last we reached the Artic. You see, we were after the right-whales, and had to go there to find them. We cruised for a long time before we saw a blow, and once or twice the old hooker came near getting ripped in the ice. If this had happened she would have been squashed as flat as a pancake.

One day, about this time, the lookout in the cro'nest sang out, "Land ho!"

The captain was surprised, for he didn't expect to see land hereabouts. He sent the mate aloft to see what he could make out of it. He hadn't been aloft long when he hailed the deck and reported the land to be a large floating island.

"A what, sir?" replied the captain, astonished.

"A big floating island, sir!" replied the mate.

"You're crazy, sir! Who ever heard of a floating island in the Artic Ocean? Take another look, sir," angrily said the captain.

"It's a whale, sir!" sang out the mate in a scared kind of a voice.

"That's more like it, sir. I smell him now," said the captain.

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"Tom Dick & Harry on the Coast Of Maine," St. Nicholas Magazine, August 1888, by Daniel Beard,

"I don't know about that, Dick," said Harry; "when I caught sight of that floating island coming at us, mouth on, the thought of Jonah's journey whizzed through my mind. I had almost decided that if I had to be drowned or swallowed, I'd risk drowning as the lesser evil."

"Ocean Jockeys. Strange Riders at Sea," Syracuse Evening Herald, July 21, 1895, describes the coast off San Clemente, California.

Right in mid-channel, I saw the spout of a big gray whale, and the next minute saw the back of the whale, about 20 feet of it, black as ink, on the blue water. To my surprise, it did not disappear, and I soon concluded that the big creature was either asleep or lying on the surface sunning itself. As we came nearer, I saw at least fifty little birds running about on its back, feeding, evidently having a feast upon the various parasites on the whale's back.



"A Tale of a Whale," 1905, by a 16 year old T.S. Eliot, the narrator, marooned upon a whale's back, decides to have a swim and spies some floating wreckage. He hauls it aboard, fashions a mast and sail, digs a hole in the whale's back, plants his construction, and three months later arrives in Honolulu after "an uneventful voyage."

"Fish Run Away With Target: British Captain Was Showing Off Skill of His Gunners When the Floating Mark Got Lively," Washington Post, April 21, 1907,

The order to stop was promptly obeyed, and presently there floated placidly by something that looked to the excited men's eyes like a floating island.

Arming himself with the boat-hook, the Corporal boldly made a lunge at the mysterious object. There came a violent upheaval of the water, and the next moment over went the boat and down into the briny depths of the Indian Ocean went the five gallant gunners. The boat had run on to the back of the mysterious monster, and it had wriggled with disastrous result when it felt the stab.

"Mighty foine island, that," gasped Gunner O'Flannagan as he rose. spluttering. to the surface. "This is too much like whale huntin' to please me."

The setting of "Floating Island Home of Birds Turns Out to be a Big Whale," New York Evening Telegram, August 10, 1908, is off Boone Island of the New England coast,

"I've travelled in the South Sea waters." said the skipper today, "and I saw many curious things there, including floating islands inhabited by animals and birds, but without a human being on them. I never saw anything like that in civilized waters, however, so we laid a course for the island or whatever it was. There were thousands of birds either perched on the floating mass or fluttering above it.

"When we could make out what it was we found it to be a huge whale, apparently dead, and with numberless birds of all varieties feeding on the carcass.

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Chapter 6 -- Assure that the the Island's Not a Whale

An Irish drinking song,

*When I was a lad on the Emerald Isle
I heard many stories both lovely and wild*

*About the great dragons and monster
that be
That swallow the ships when they sail
on the sea*

Chorus:

*We sailed for St. Brendan's Fair Isle,
Fair Isle
We sailed for St. Brendan's Fair Isle*

*At last we came unto a beautiful land
We all went ashore and we walked on the sand*

*We took our long bows and killed a Zebu
We roasted it up and had hot barbecue*

*And after a while we were singing a song
We noticed the island was moving along*

*Now Brendan said boys it is much to my wish
We ride on the back of the world's biggest fish*

*Hold fast to the rope that is pulling the ship
We'll need it someday if this fish take a dip*

*We sailed every ocean we sailed every sea
We sailed every spot that a sailor could be*

*We ate and we drank and we rode in high style
In forty four days we sailed ten million miles*

Do good stories die? From Howard Garis's Uncle Wiggily Back on Shore (1931),

*Uncle Wiggily, who was being blown out to sea by the wind and the big bunch of toy balloons
He held, looked down again at the tumbling, white ocean waves below him.*

*"I want to tell you what that is down there," said the fish-hawk, pointing with one wing. "Do you
want to know?"*

"Yes," said Uncle Wiggily. "I do, thank you. Is it a floating island?"

"Yes, it is a sort of floating island," squawked the bird.

"Ha! Ha! Ha!" laughed Uncle Wiggily all of a sudden.

*"What are you giggling at?" asked the fish-hawk, who was swooping around, looking hungrily at
a yellow balloon this time. Perhaps he thought it was a large, round lollypop.*

*"I am laughing when I think about floating island," said the rabbit gentleman. "You know floating
island is the name of a sort of pudding my wife makes. It's cornstarch or tapioca or something
like that, nice and sweet, and in it there are gobs of something like the whipped-up whites 'of
eggs floating around. Maybe my wife is, making some of her floating island dessert now and
she is expecting me home on> shore and I can't get back and -- Oh dear! It is very sad!"*

The pudding which the rabbit refers is the subject of Chapter 84, but as we noted earlier, it's not yet time for desert.

*"But it looks like an island," said Mr. Longears. "And it is certainly floating. And little animal
children are playing tag on it."*

*"Yes," squawked the fish-hawk, "but it isn't an island. It is the back of a big whale fish sticking
up out of the water. And a whale fish is so big that even a little piece of his back sticking up out
of the water looks like an island."*

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"How wonderful!" said Uncle Wiggily. "But what about the little children playing on the whale's back?"

"They are sea urchins," answered the fish-hawk, who was circling around the balloons that Uncle Wiggily held. "They are real sea urchins just like children. But now if you want to get back on shore I'll help you to do so."

So the fish-hawk nipped holes in five balloons, a red one, and also a pink, purple, yellow and blue. Gently Uncle Wiggily dropped down to the whale's back that was like a floating island. The sea urchins danced around the rabbit. The whale who had been asleep, flipped his big tail and swam so close to shore that Uncle Wiggily could jump over on the sandy beach and there were all his little bunnies, and his wife and Nurse Jane waiting for him. He was back on shore..



We've The Adventures of Tom Bombadil (1962), in which J.R.R. Tolkien uses the name "Fastitocalon" from "The Whale," an old English poem in which the monster appears.

*Look, there is Fastitocalon!
An island good to land upon,
Although 'tis rather bare.
Come, leave the sea! And let us run,
Or dance, or lie down in the sun!
See, gulls are sitting there!
Beware!*

As the monster-like redfish in Terry Gilliam's film The Adventures of Baron Munchausen (1988) has a blowhole like a whale, we'll classify it as such, The Baron mistakes it for a volcanic island, and finds upon it fanciful palaces, ornate weapons, a flying, three-headed, clockwork chicken, a moving paper city and animated constellations.

A bad whale and a nice one.



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CHAPTER 7

ASSURE THAT THE ISLAND'S NOT A TURTLE

Turtle-back islands are another staple of folkloric geography. Some mythologies refer to a tortoise, rather than a turtle, but as the former is a land creature and the latter, amphibious, the latter is thus the more likely reptile to behave as an island.

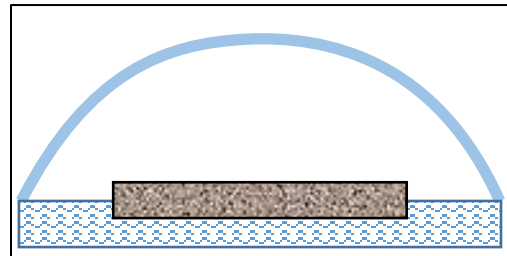


As to why turtles are associated with floating islands, we look to ancient cosmologies as to how early peoples envisioned their universe.

Until about the 5th century BC, tribal peoples in both the eastern and western hemispheres conceived of the earth as a flat disk. According to Paul Seely, in "The Geographical Meaning of 'Earth' and 'Seas' in Genesis 1:10," Westminster Theological Journal 59 (1997),

In every pre-scientific cosmology which I have seen that mentions the sea, the earth is described as circular, floating in a circular sea. The concept of a circular earth set in a circular sea is, of course, the natural result of a scientifically naive person observing the circular horizon of both earth and sea. Since the prescientific mind naturally concludes that the earth is a flat disc, it also just naturally concludes that since this disc is surrounded by a flat circular sea, it must be floating upon that sea. Thus it is that all over the world we find the belief in the earth as a flat circular disc floating in the middle of a single circular sea.

To the right, the earth as a disk floating in a surrounding sea. Overhead, a dome-shaped sky bridging between the horizons is the pathway of celestial bodies. Upwelling subterranean water supplies the floating earth's springs and wells.



A sample of cosmologies in which "floating" appears to be explicit:

W.G. Lambert, "The Cosmology of Sumerian and Babylon," Ancient Cosmologies (1975), C. Blacker and M. Lowe, eds., and T. Jacobsen, "Mesopotamian Religion, An Overview," Encyclopedia of Religion (1987), notes that the Sumerians imagined the earth be a flat disk floating upon a vast subterranean freshwater sea, the Abzu.

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W.F. Albright, "Mouth of the Rivers," American Journal of Semitic Languages and Literatures (1919), describes the Abzu as,

The subterranean fresh-water ocean whence the rivers flow... Water which down the pure Euphrates he (Ea) had guided, the product of the apsu.

Likewise, according to A. Deimel 'Enuma Elis' und Hexaameron (1934), the Abzu is,

The sweet-water abyss in which the earth swims.

Since the Babylonians inherited Sumerian concepts, they likewise believed that the earth floated on an ocean. A creation text from Eridu begins with a primeval sea upon which Marduk constructs a reed raft "on the surface of the waters" and piles it with dirt.

In a more-macabre account from Enuma elish, Marduk used half of the corpse of Tiamat to construct the earth, opened "the deep" below her body, "closed up her nostrils, reserved the water," then "drilled fountains in her" and "caused to flow from her eyes the Euphrates [and] Tigris."

Marvin Pope, El in the Ugaritic Texts (1955),

The sea was conceived as a single body of water. Thus the earth was thought to float on the sea that surrounds it.

Siegfried Morenz, Egyptian Religion (1992),

The earth rests on or in the primeval ocean.

Henri Frankfort, John Wilson and Thorkild Jacobsen, The Intellectual Adventure of Ancient Man: An Essay of Speculative Thought in the Ancient Near East (2013),

The Egyptian conceived of the earth as a flat platter with a corrugated rim. The inside bottom of this platter was the flat alluvial plain of Egypt, and the corrugated rim was the rim of mountain countries which were the foreign lands. This platter floated in water. There were the abysmal waters below, on which the platter rested, called by the Egyptian "Nun."

In addition to being the underworld waters, Nun was die waters encircling the world, the Okeanos which formed the outermost boundary.

The Hebrews likewise envisioned the earth in the floating manner.

Gen 7:11	<i>In the six hundredth year of Noah's life, in the second month, the seventeenth day of the month, the same day were all the fountains of the great deep broken up, and the windows of heaven were opened.</i>
Gen 49:25	<i>Even by the God of thy father, who shall help thee; and by the Almighty, who shall bless thee with blessings of heaven above, blessings of the deep that lieth under, blessings of the breasts, and of the womb [tehom] lying below.</i>
Deut 33:13	<i>And of Joseph he said, Blessed of the Lord be his land, for the precious things of heaven, for the dew, and for the deep that coucheth beneath.</i>
Ps 136:6	<i>To him that stretched out the earth above the waters. Better translated, the earth upon the waters.</i>

Jumping northward, "Finno-Ugric Religions: An Overview," Encyclopedia of Religion (2005),

According to the cosmology of the Finno-Ugrians, a stream encircles the world... This stream is called by some of them "a vast ocean." In their creation story the earth is "spread out over the primal sea.

Hugh Stait, The Bavenda (1968), regarding African lore,

[The earth] is thought to be a large flat disk floating in water, roofed by the dome of the sky, makholi, which meets the circumference of the disk at the horizon.

The Origin of Life and Death: African Creation Myths (1966), Ulli Beier, ed.

At the beginning everything was water. Then a god came to create the dry land, bringing some pieces of iron and earth with him. He placed the iron on the water and "spread the earth over it."

The oldest Chinese view of the universe involves a square earth encircled by a "rim ocean" that meets the inverted bowl-like firmament touching down on all sides. The Tao Te Ching speaks of the importance of the power of "the One" without which the "settled earth might sink."

The Hindu Rig Veda 10:121,

His, through his might, are these snow-covered mountains, and men call sea and Rasa his possession: His arms are these, his are these heavenly regions.

Barbara Sproul, Primal Myths: Creation Myths around the World (1979), interpreters the Rasa as a reference to the "earth-encircling stream." F.B.J. Kuiper, Ancient Indian Cosmogony (1983) likewise sees the term as reference to the earth floating on primeval waters.

The Yajar Veda, as quoted in Franciscus Bernardus Jacobus Kuiper and John Irwin's Ancient Indian Cosmogony (1983),

Originally, it [the earth] was as small as the boar's snout, but soon, while still floating on the surface of the waters, it began to grow.

The Maha-Parinibbana Sutra, as quoted in "Cosmogony and Cosmology (Buddist)," Encyclopedias of Religion and Ethics 4 (1910),

When Ananda inquires as to the existence of earthquakes, Buddha answers as follows:

"The great earth, Ananda, is established on water, the water on wind, and the great wind, upon space. And at such a time, Ananda, as the mighty winds blow, the waters are shaken by the mighty winds as they blow, and by the moving water, the earth is shaken."

Another sutra relates to the question of the Brahman Kasyapa:

*"On what rests the earth?"
On the circle of water.'*

*"And the circle of water?"
On the wind.'*

*"And the wind?"
On the ether.*

*"And the ether?"
You go too far, O Brahman.
The ether does not rest on anything it has no support*

According to W.G. Aston, Nihongi: Chronicles of Japan from the Earliest Times to A.D. 697 (1956), early Japanese writings perceived the earth as an island surrounded by ocean. The oldest Japanese sources say,

Of old when the land was young, it floated about as [if] it were floating oil.

According to C. Etter, Ainu Folklore (1949), the tribal Japanese considered earth to be "round like a ball" embedded in the ocean. The Ainu word for "earth" means "floating land."

Chapter 7 -- Assure that the the Island's Not a Turtle

Surely we've established our point. Ancients of many lands were in agreement that the earth floats upon a subterranean sea.

But, we ask, whatever does such cosmology have to do with turtles?

It's about the shell, we answer.

As the flat under-shell and domed upper shell of a turtle illustrates the perception of the universe, it's not surprising that to animistic philosophers, the creature is associated with creation.

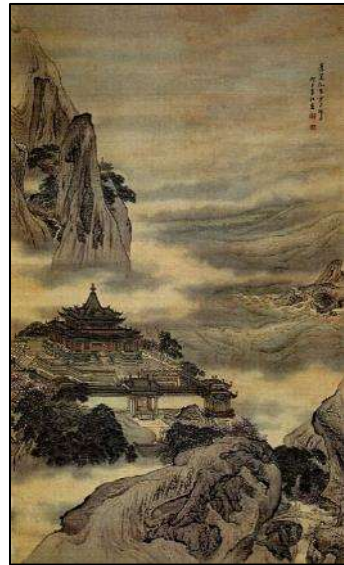
Again, we've a spectrum of examples.

According to Hindu legend, Mount Mandaranchal (or Mount Meru) was the dasher for the Ocean of Milk. Vasuki, king of serpents, was the churning rope, pulled alternatively by the gods holding the snake's tail, and the demons, its head. When Mount Mandaranchal began to sink, Vishnu, in his second incarnation, the turtle Kurma (or Kurmaraja), came to the rescue by supporting the mountain on his back.

According to The Book of Lieh-tzu, and Classic of Mountains and Seas (both 4th century BC), the Isles of the Blessed, Tai-yu, Yuan-chiao, Fang-hu, Ying-chu, and P'eng-lai, drifted on the Eastern Sea before being secured by great turtles after Taoist sages petitioned the highest gods to prevent the islands further drifting.

Two of the turtles (Tai Yu and Yuan Chaio) were captured by a giant and were carried north. The other three (P'eng-Lai, Fang Hu and Ying Chou) remained in the Eastern Sea.

An unsuccessful mission to discover P'eng-Lai occurred in the 4th century BC. Another ill-fated expedition was initiated in 219 BC by Emperor Ch'in Shih Huang-ti, whose legendary gardens may have furthered the myth.



P'eng-lai Floating Island

Theories of P'eng-Lai's geographic inspiration suggest Japan, Jeju Island south of the Korean peninsula, and Taiwan.

Another explanation is that of mirages in which islands and trees seem to rise east of the Chinese coast. In Northern Mists, Arctic Exploration in Early Times (1911), Fridtjof Nansen reports,

Even the Chinese have legends of the Isles of the Blest, which lie 700 miles from the Celestial Kingdom out in the Yellow Sea, and gleam in everlasting beauty, everlasting spring and everlasting gladness. The wizard Sun-Tshe is said once to have extorted from a good spirit the secret of their situation, and revealed the great mystery to the emperor Tshe-Huan-Ti (219 BC). Then the noblest youths and the most beautiful maidens of the Celestial Kingdom set out to search for Paradise, and lo! it suddenly rose above the distant horizon, wrapped in roseate glow. But a terrible storm drove the longing voyagers away with cruel violence, and since then no human eye has seen the Isles of the Blest.

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Book of Wonders of India by Captain Bozorg, Son of Shahriyar Ramhormoz (1883) draws upon And on to North America. The Lenape (a Delaware tribe) myth of the "Great Turtle" was first recorded in the Journal of Jasper Danckaerts, 1679-1680, as told by a Native American, about 80 years of age,

We asked him, where he believed he came from? He answered from his father. "And where did your father come from?" we said, "and your grandfather and great-grandfather, and so on to the first of the race?" He was silent for a little while, either as if unable to climb up at once so high with his thoughts, or to express them without help, and then took a piece of coal out of the fire where he sat, and began to write upon the floor. He first drew a circle, a little oval, to which he made four paws or feet, a head and a tail. "This," said he, "is a tortoise, lying in the water around it," and he moved his hand round the figure, continuing, "This was or is all water, and so at first was the world or the earth, when the tortoise gradually raised its round back up high, and the water ran off of it, and thus the earth became dry."

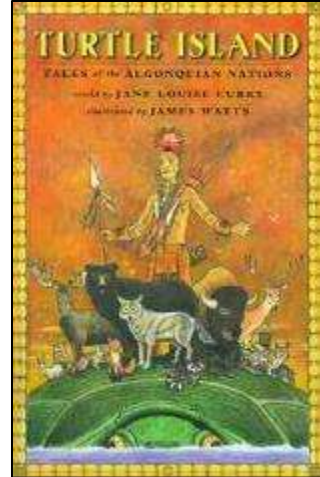
Iroquois myth says that the earth, which they called Turtle Island, was a once a great floating on the back of the Great Turtle Hab-nu-nah made from soil that Muskrat brought up from the muddy bottom of the ocean to give the fallen goddess Sky Woman a place to live. A version from "Indian Superstitions," North American Review, July 1866,

While the earth was as yet a waste of waters, there was, according to Iroquois and Huron traditions, a heaven with lakes, streams, plains, and forests, inhabited by animals, by spirits, and, as some affirm, by human beings. Here a certain female spirit, named Ataentsic, was once chasing a bear, which, slipping through a hole, fell down to the earth. Ataentsic's dog followed, when she herself, struck with despair, jumped after them. Others declare that she was kicked out of heaven by the spirit, her husband, for an amour with a man; while others, again, hold the belief that she fell in the attempt to gather for her husband the medicinal leaves of a certain tree. Be this as it may, the animals swimming in the watery waste below saw her fall, and hastily met in council to determine what should be done. The case was referred to the beaver. The beaver commended it to the judgment of the tortoise, who thereupon called on the other animals to dive, bring up mud, and place it on his back. Thus was formed a floating island, on which Ataentsic fell, and here, being pregnant, she was soon delivered of a daughter, who in turn bore two boys.

Chapter 7 -- Assure that the the Island's Not a Turtle

In The Lendpe and their Legends (1885), D.G. Brinton relates a legend of the Delaware, an Algonquin tribe.

When a deluge submerged nearly the whole earth, only a few persons survived by taking refuge on the back of a turtle so old that his shell resembled a stream bank. As they were floating, a loon flew their way, and they begged him to dive and bring up land from the depths. The bird complied, but could find no bottom. Then he flew far away and came back with a little earth in his bill. Guided by him, the turtle swam to the place where dry land was found and his passengers settled and repopulated the country



Turtle Island: Tales of the Algonquian Nations (1999),

Jane Louise Curry

"Ocean Jockeys. Strange Riders at Sea," Syracuse Evening Herald, July 21, 1895, also concerns a turtles, not island sized perhaps, but at least log sized.

On another occasion as I was cruising down by Ensenada, I ran into a little bay one day, and saw what I supposed to be a log floating on the surface, as on it were numerous birds, some walking about others apparently asleep. As we ran in nearer I saw that it was a big sea turtle, asleep on the surface, and the birds had alighted upon its broad back as they would have done upon floating timber.



"Expedition Lands on Uninhabited Island off Coast, Sea Guile Preened Themselves on Backs of Turtles, Which Were So Numerous They Resembled Floating Islands," Watertown Daily Times, July 17, 1916, is set off of the Mexican Pacific coast

There were so many turtles that we got tired of feeding on them. It was curious, to see these creatures being regarded by the birds as a kind of floating island, and to see gulls preening themselves on the turtles' backs.

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Chapter 7 -- Assure that the the Island's Not a Turtle

In Turtle Island (2004) by Kevin Sherry, a children's book of predictable plot (as it should be), there's loneliness, new friends, loss thereof and their return for a happy ending.



In Star Trek "Titan: Over a Torrent Sea" (2009), the crew observes islands floating in the sea of planet Droplet. Putting 2 and 2 together, Torvig asks a Chelon crewman -- Chelons being turtle-men -- if the islands might be his relatives.



We'll save to Chapter 9, Light No Fire, a tale of turtle soup.

A sample of contemporary artwork,



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Chapter 7 -- Assure that the the Island's Not a Turtle



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Sindbad (1999) by Ludmila Zeman

Tabletop Games

Dungeons & Dragons. Al-Qadim setting. The Zaratan is a turtle, 200-350 feet across, with rock outcroppings on its shell and flippers resembling reefs. When asleep on the surface, it can be mistaken for a small floating island. An uninhabited island in Oriental Adventures setting is a dragon turtle -- 300 feet across, we're told -- also sleeping on the ocean's surface.

Atlantis: The Lost World. Leviathans are giant marine turtles 200 to 400 feet long. Their shells are encrusted with coral, mollusks and seaweed, and when basking on the surface, sailors again mistake them for small reefs or islands.

Yu-Gi-Oh!, the Island Turtle



Magi-Nation, the underwater Orothe cities built on the backs of giant sea turtles



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Video Games

Golden Axe has a village on the back of a giant turtle that swims across the sea

The Legend of Zelda: Majora's Mask has a friendly turtle of an island who takes Link to a dungeon in the midst of a maelstrom.

The Pokemon "Turtwig" evolutionary family is based on the world-on-a-turtle mythology.

There is a turtle island in Endless Ocean: Blue World.

Groundshaker Kingdom Hearts II boss is a quadruped monster with a small forest on its back.

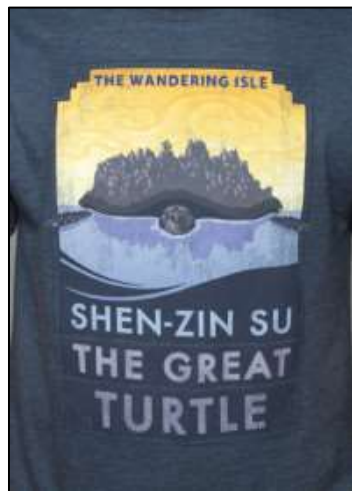
Secret of Mana features an island that appears to be a turtle's back, at least in overhead view, but nothing comes of the fact.

In the final levels of Katamari Damacy, some islands try to run away because they are actually giant sea turtles.

In King's Bounty: The Legend, a scientist hypothesizes that the world rests on the back of a giant turtle, ridiculing the hypothesis that the world is a sphere orbiting a sun.

Sonic Heroes' stage Ocean Palace abounds with giant turtles through which the teams must pass.

The starting point in World of Warcraft: Mists of Pandaria, lies on the back of the giant turtle, Shen-zin Su. The isle is inhabited by curious pandaren who left their homeland after the Sundering and have been drifting on the ocean ever since.



Conclusion

From ancient myths to modern video games, the turtle-as-floating-island is standard stock.

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CHAPTER 8

ASSURE THAT THE ISLAND'S NOT ANOTHER SORT OF SEA CREATURE

The ocean swarms with possibilities.

A Crab

Christianus Franciscus Paullinus' "Monstrum marinum septentrionale," Observationes Medico-Physicae, Rarae, Selectae et Curiosae (1706) mentions a mythical giant crab, trees growing on its back, that rises to sun itself during the day.



A Kraken

The kraken is a sea monster said to dwell off the coasts of Norway and Greenland. Our interest is in such creatures mistaken for islands, not the sea-devils demolishing ships.

Linnaeus' Systema Naturae (1735) designated our beast *Microcosmus marinus*, "little world in the sea," but later recognizing that no such creature had been scientifically documented, the entry was removed in his second edition.

We'll begin with King's Mirror or Konungs Skuggsjá (c. 1250), a Norwegian tale/

There are... very few who can tell anything definite about it, inasmuch as it is rarely seen by men; for it almost never approaches the shore or appears where fishermen can see it, and I doubt that this sort of fish is very plentiful in the sea.

I can say nothing definite as to its length in ells, for on those occasions when men have seen it, it has appeared more like an island than a fish. Nor have I heard that one has ever been caught or found dead. It seems likely that there are but two in all the ocean and that these beget no offspring, for I believe it is always the same ones that appear previously had rushed in eagerly to seek food.

Örvar-Oddr, an Icelandic saga recorded in the late-14th century, describes a journey to Baffin Island.

[The lyngbakr] is the largest whale in the world, but the hafgufa is the hugest monster in the sea. It is the nature of this creature to swallow men and ships, and even whales and everything else within reach. It stays submerged for days, then rears its head and nostrils above surface and stays that way at least until the change of tide. Now, that sound we just sailed through was the space between its jaws, and its nostrils and lower jaw were those rocks that appeared in the sea, while the lyngbakr was the island we saw sinking down.

Erich Pontoppidan first used the name "kraken" in Natural History of Norway (1752).

Our fishermen unanimously affirm, and without the least variation in their accounts, that, when they row out several miles to sea, particularly in the hot summer days, and... expect to find 80

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or 100 fathoms water, it often happens that they do not find above 20 or 30, and sometimes less. Their lines, they say, are no sooner out than they may draw them up with the hooks all full of fish: by this they judge that the kraken is at the bottom. They say this creature causes those unnatural shallows mentioned above, and prevents their sounding... Throwing out their lines at a moderate distance from each other; and the only thing they then have to observe, is, whether the depth continues the same, which they know by their lines, or whether it becomes shallower... If this last be the case, they find that the kraken is raising himself nearer the surface.

They lie upon their oars, and, in a few minutes after, they see this enormous monster come up to the surface of the water; he there shows himself sufficiently, though his whole body does not appear... its back, or upper part, which seems to be in appearance about an English mile and an half in circumference, (some say more, but I choose the least for greater certainty,) looks at first like a number of small islands, surrounded with something that floats and fluctuates like seaweed... At last several bright points or horns appear, which grow thicker and thicker the higher they rise above the surface of the water, and sometimes they stand up as high, and as large, as the masts of middle-sized vessels.

Mr. Luke Debes, in his description of Faroe, speaks of certain islands which suddenly appear, and as suddenly vanish. This was a thing nobody could comprehend; so that one ought not to wonder at the common people, and even those that were a degree above them, for looking upon these moving islands to be inhabited by evil spirits, which appeared sometimes in such places where the seamen, by daily experience, knew very well that there was no such thing as a rock, much less an island.

Concerning moving islands, there is a remarkable testimony of the same kind, concerning an island appearing in Breidefiord, on the coast of Iceland. It is a pity that he does not tell us whether it always remained there.

Many seafaring people give accounts of such appearances of land, and their suddenly vanishing away, and particularly here in the North Sea. These islands, in the boisterous ocean, cannot be imagined to be of the nature of those real floating islands, that are seen on fresh and stagnant waters, and which I have observed, are found here in Norway, and in other places.

Pontoppidan was well aware floating islands of less-fantastic nature, a phenomenon, our Chapter 22, Check for Organic Certification.

In some [Norwegian lakes] are also floating islands, or parcels of land about thirty or forty ells in length, with trees growing on them, which having been separated from the main land, are driven about as the wind sets, and when close to the shore, are moved off with a pole. They are said to grow, as it were, by the accession of reeds, grass, weeds, and the like.

Norwegian Lapland, little changed since the time of Pontoppidan



But back to his remarks regarding islands adrift on the high seas,,

These could not possibly hold or stand against the violence of the waves in the ocean, which break the largest vessels; and therefore our sailors have concluded that this delusion could come from no other than that great deceiver the devil.

But according to the laws of truth, we ought not to charge this apostate spirit without a cause. I rather think that the devil, who so suddenly makes and unmakes these floating islands, is the kraken.

Chapter 8 -- Assure that the the Island's Not Another Sort of Sea Creature

What confirms me in this belief, is the following occurrence, quoted by that worthy Swedish physician, Dr. Urban Hierne, in his Short Introduction to an Enquiry into the Ores and Minerals of that Country, from Baron Charles Grippenheim.

"Amongst the rocks about Stockholm there is sometimes seen a certain tract of land, which at other times disappears, and is seen again in another place. Buraeus has called it an island, in his map. The peasants, who call it Gummar's Ore, say that it is not always seen, and that it lies out in the open sea, but I could never find it.

"One Sunday, when I was out among the rocks, sounding the coast, it happened that in one place I saw something like three points of land in the sea, which surprised me a little, and I thought that I had inadvertently passed over them before. Upon this, I called to a peasant to enquire for Gummar's Ore, but when we came, we could see nothing of it, on which the peasant said, all was well, and that this prognosticated a storm, or a great quantity of fish, etc."

Now who is it that cannot discover, at first sight, that this visible and in visible Gummar's Ore, with its points, and prognostications of fish, cannot possibly be anything but the kraken... improperly placed in the map by Buraeus as an island.

Probably the creature keeps himself always at that spot, and often rises up amongst the rocks and cliffs.

Armand Landrin's, The Monsters of the Deep, and Curiosities of Ocean Life (1875) informs us,

The geographer Bureaus, according to one of the French naturalists, had set down on a chart an island named Gummer's ore, in sight of Stockholm. Baron Charles de Grippenheim had vainly sought for it in all directions, when, one day, accidentally turning his head, he perceived, as it were, three points of land which had suddenly risen above the surface of the waves.

"No doubt," he said to the pilot who steered his shallop, "yonder is the Gummer's Ore of Bureaus."

"I don't know," replied the pilot, "but be you certain that what we see prognosticates either a tempest or a great abundance of fish. Gummer's Ore is nothing but a group of reefs lying level with the water, where the soe-trolden lurks; or rather, it is the soe-trolden (the kraken) itself."



17th century maps showing Gummer's Ore

Based on the mapped distance, the isle's elevation would have to been in excess of 30 feet to be seen by Grippenheim.

But soon thereafter, the island is removed from the maps..

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1762 and today, Gummer's Ore no more.

Jacob Wallenberg's My Son on the Galley. (1781)

Kraken, also called the Crab-fish, which is not that huge, for heads and tails counted, he is no larger than our Öland [the second largest Swedish island, less than 16 kilometers]. Gradually, kraken ascends to the surface, and when he is at ten to twelve fathoms, the boats had better move out of his vicinity, as he will shortly thereafter burst up, like a floating island, spurting water from his dreadful nostrils and making ring waves around him, which can reach many miles.

More than a century after Pontoppidan, the Stockholm sighting was still in the news, as evidenced by a letter from Kristianstad, Sweden, June 10, 1785, published in the Columbian Herald, of South Carolina, in October of that year,

Some sailors belonging to a vessel arrived here from the North Sea, give an account that several league from land they saw a strange appearance of something floating like a large quantity of sea-weed. In little time it sunk, and caused a vast swell. Relating this affair to an intelligent sea-faring gentleman here, he himself asserted, that near Stockholm he a few summers ago perceived a kind of floating island, which soon disappeared, but was afterwards seen further off. As it moved a prodigious swell ensued.

Mentioning the circumstance, at Stockholm he was informed that what he had seen was a sea animal, that that the fishermen, at the bearing of certain points, had seen him rise and were obliged to row off till they got into proper soundings. A gentleman being among some rocks, sounding the coasts, beheld something rise in the sea, which appeared like an island, and then disappeared.

In Travels Through Sweden, Finland, and Lapland, to the North Cape, in the Years 1798 and 1799 (1802), Giuseppe Acerbi discredits the voracity of the lore.

Before we close our catalogue of Lapland fishes, we should think ourselves unpardonable not to notice what has been said of a sea-monster called the krake, or, as the word has been used in the plural number, the kraken.

Such are some of the particulars which have been related respecting this extraordinary production of nature; stories that appear to have been swelled out and augmented in the course of narration from one credulous hearer to another, and in all likelihood had their origin in some dead whale of extraordinary bulk being seen floating on the surface, on whose back had grown those marine plants, and other substances which usually fasten to inert bodies in the seas. This incident afterwards was increased to that of a floating island, or some sea monster as large as an island, to which at last they gave the name of the krake.

"On the Kraken and the Great Sea Serpent," Blackwood's Edinburgh Magazine, March, 1818

The history of the kraken is still involved in great obscurity. In the first place, it may be observed that, the belief in a certain monstrous sea-animal, which appears in calm weather, on the surface of the ocean, like a floating island, and stretching forth enormous arms, or tentacula, is universal among the sailors and fishermen of the Norwegian coast.

A similar monster is alluded to by almost all the Scandinavian writers, from the earliest period of their history down to the present day. The epitome of these accounts is this, that, during the prevalence of fine weather, in the warmest days of summer, an enormous animal has been observed in the North-Sea, resembling a floating island, about a quarter of a mile in diameter, and appearing to be covered with sea weed, etc..

"Remarks on the Histories of the Kraken and Great Sea Serpent," The Coila Repository: And Kilmarnock Monthly Magazine, April 1818,

The belief in a certain monstrous sea animal, which appears in calm weather on the surface of the ocean like a floating island, and stretching forth its enormous tentacula, is universal among the sailors and fishermen of the Norwegian coast. The epitome of the accounts of the Scandinavian writers is this, that during the prevalence of fine weather, in the warmest days of summer, an enormous animal has been observed in the North Sea, resembling a floating island, about a quarter of a mile in diameter, and appearing to be covered with sea weed, &c.

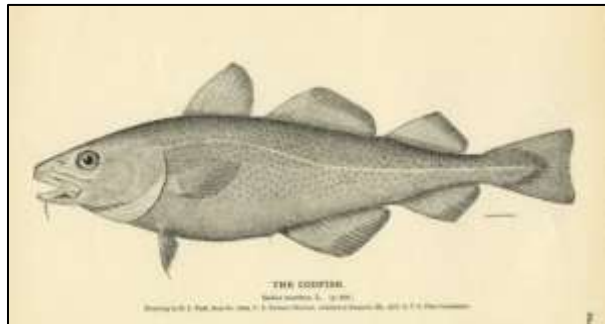
"The Monsters of Fiction," San Francisco Call, January 3, 1892, reports what a "zoologist said to a Washington Star writer."

There is a third fabulous monster of the deep, firmly believed in a century or so ago, which may be presumed to be wholly a creature of the Imagination. It was called the "kraken," and was so enormous that when it came to the surface the people frequently mistook the animal for a floating island. You may remember that Sinbad the sailor landed upon such a one, which sank beneath him.

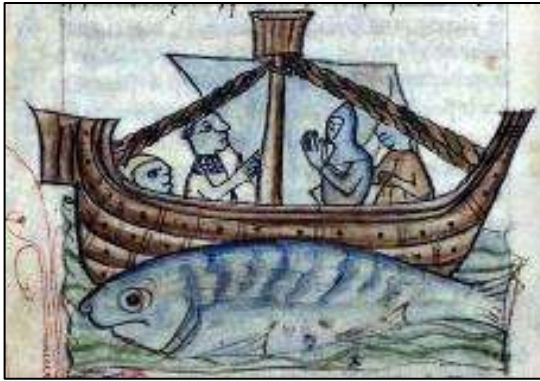
After enjoying more than a century as a reported floating island, the kraken has made itself scarce.

A Cod

While no one suggests that a codfish might be of floating-island dimensions, many early illustrations of St. Brandon's voyage (Chapter 3) show his lunchtime landing to be on a cod-like creature.



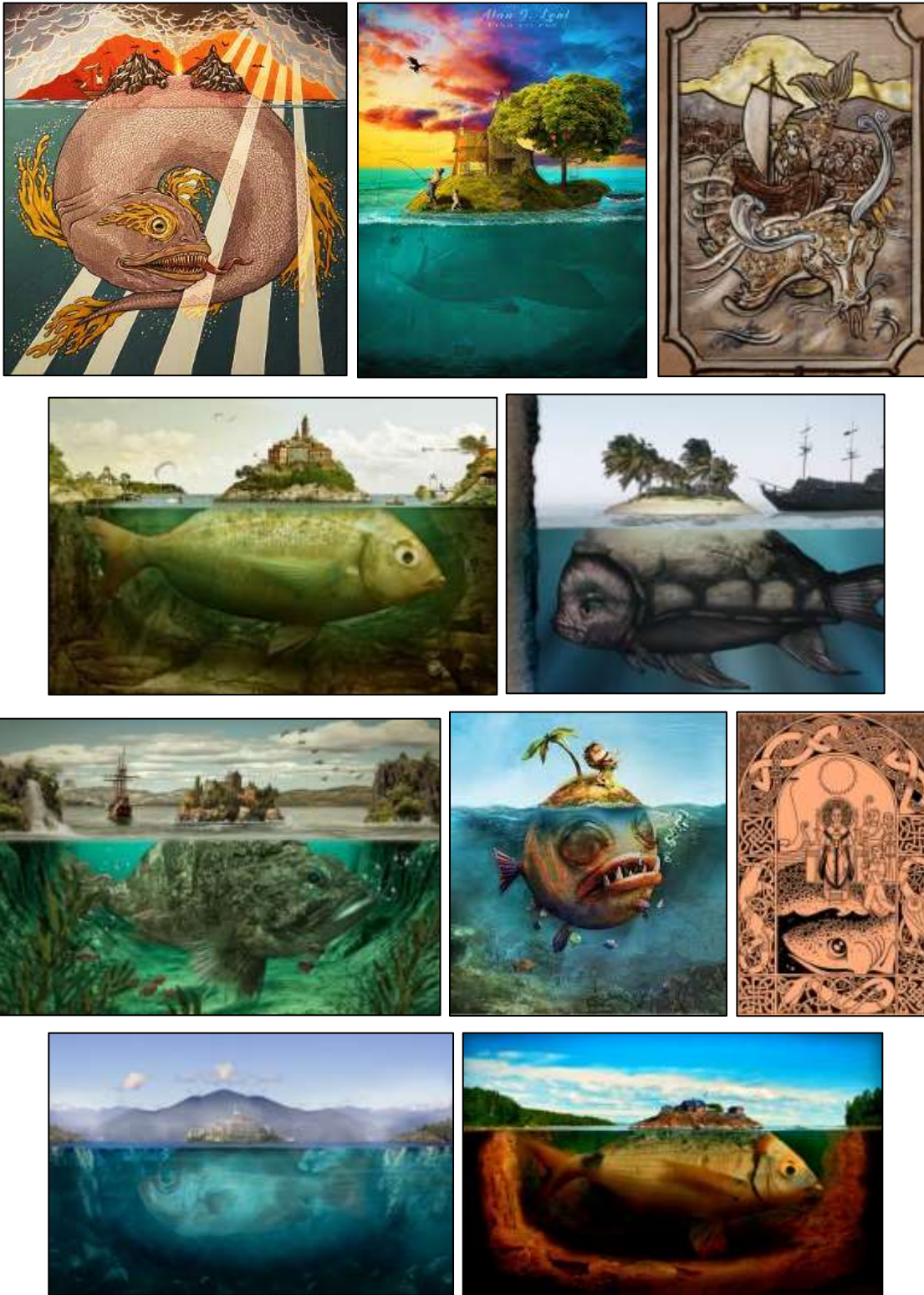
Chapter 8 -- Assure that the the Island's Not Another Sort of Sea Creature



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Chapter 8 -- Assure that the the Island's Not Another Sort of Sea Creature

Today's portrayals of fish as floating islands tend to be less cod-like.



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An Alligator

We'll deviate a moment from the open sea to the swamps of Florida.

"An Alligator Knocks Out a Steamer," Washington Evening Star, March 18, 1889,

The steamer Comet came down from Crescent City this morning with her bow stem broken and several planks sprung. It seems that while coming around a sharp bend in Dunn's creek, known as Danger point, she struck a huge alligator, which is claimed by the captain to have been about 18 feet long. This creek connects Lake Crescent with the St. John's River, and is famous for its floating islands, which are composed of bonnets, water lilies and such other vegetation checking her speed. The captain noticed that this particular island was rather large, but paid no attention to it, for an opposition steamer was crowding him and he could not afford to check up. The boat struck the floating island with terrible force, breaking her bow stem, as above stated, and shattered the boat considerably. The passengers were terribly frightened, and the ladies ran about asking in pitiful tones for help, and it took several minutes for the crew to quiet those frantic passengers. An investigation was made. The creek was red with blood and the snorting in the water terrific. It turned out that the supposed island was nothing more than a huge alligator, whose back was covered over with bonnets and water lilies, resembling an island, obstructing the hide of the saurian from view. Instances of this kind happen quite frequently on the river, but it is the first time to our knowledge that a steamer was ever so badly damaged as was the Comet. The Comet will be repaired today and resume her route tomorrow.

"Grapple With Alligator. Hunter's Experience on Floating Island in a Texas Lake," Daily Kennebec Journal, December 1, 1913,

F.W. Anderson recently had a thrilling experience capturing a fourteen-foot alligator at Clear Lake. The alligator hunter saw the big 130-year-old alligator go under a floating island. He jumped on the island and started to prod the American representative of the genus crocodile so that it would be forced to come out in the open, where it could be lassoed and pulled upon the shore.

The monster became vexed, so he started clawing at the pole and the under part of the floating island until the dirt of which the island was composed caved into the water, and Anderson found himself face to face with the fourteen-foot alligator in water which was nearly neck deep.

And then, there's E.A. Matthews' "A Floating Island," Christian Observer, October 23, 1907.

Everyone knows of that great animal the alligator that lives in Florida. Part of the time its home is in water, part of the time on dry land. In warm weather it plays in the river bayou, or rolls about on the sand and mud, sunning itself on the banks of the stream, but when winter comes, it buries its great body in the mud and settles down for a long sleep. It has no love for cold weather, and no notion of making itself uncomfortable, when it can just as well take a good long cold-weather nap, not such a bad plan, is it?



Sometimes, it happens that the seeds of grass and weeds are blown into the wet soil, and quickly spring up, green and fresh, on the back of the alligator. As a rule these tender plants are shaken or washed off when the great creatures wakes up and rolls into the water, but now and then, the mud clings, the young plants stick fast, and then, when the half awakened monster floats downstream, it looks like a moving island.

A cautionary tale,

A poor little plover once made a mistake, and built its nest on a sleeping alligator. Some boys who were out fishing saw the bird flitting above the weeds and water grasses, and thinking there might be a covey of pretty creature and a settlement or nests there, dropped their tackle and rowed out to it. When their boat came bump mg up against the sleeping animal, suddenly it opened its huge jaws and rolled from side to side. Oh, how those boys did scream! The alligator was by this time thoroughly wide-awake. It found out how hungry it was, and also how dry, and with one wild snort plunged down to the bottom of the bayou and washed off island grass and nest. So the little plover had to seek another home.

A bit more common than the Island-Masquerading-Alligator would perhaps be the Island-Creating-Alligator. We cite "The Islands the Alligators Build," Our Animal Friends, May, 1894, by Frank Chapman, for a Florida observation.

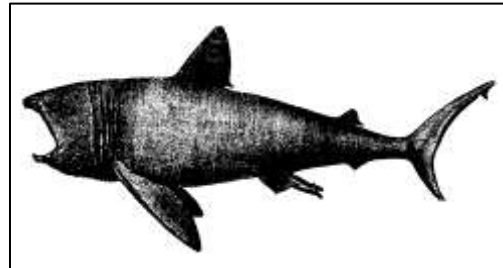
Now, if one could see a "bonnet" lake from which the water had disappeared, it would be noticed that its bottom is a network of interlacing lily-pads. The roots are as large as a man's arm, and it will be readily seen how they would prevent a large alligator from snugly nestling in the oozy mud. The alligator, therefore, prepares his bed by biting and pulling out these roots, and they come floating to the surface, showing plainly the marks of his teeth, to form the framework of a future island.

In Florida's Lake Jackson, says Mike Hulon of Texas Aquatic Harvesting, "those islands were full of marsh rats and rabbits." When the cookie cutter (Chapter 82) got going, "the alligators were in a feeding frenzy. They would have three or four rats and rabbits in their mouths at one time."

A Basking Shark

In addition to whales and turtles, "Ocean Jockeys. Strange Riders at Sea," Syracuse Evening Herald, July 21, 1895, adds sharks.

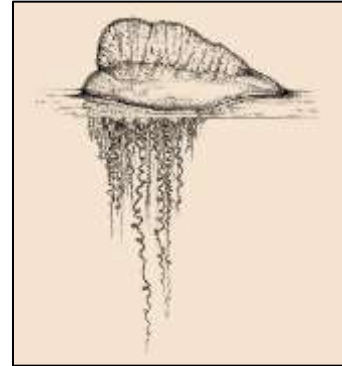
Up around Monterey a gigantic shark is sometimes caught in the net of the fisherman. It ranges from twenty to forty feet in length and is known as the basking whale, from the fact that it floats on the top of the water, literally basking in the sunlight -- much after the fashion of the sunfish. This affords a veritable floating island for the various sea birds that rise from it in a cloud as boats approach and sometimes ride upon it when the great fish swims with its back exposed.



A Portuguese Man-of-War

Frank Lattin, Penikese: a Reminiscence (1895).

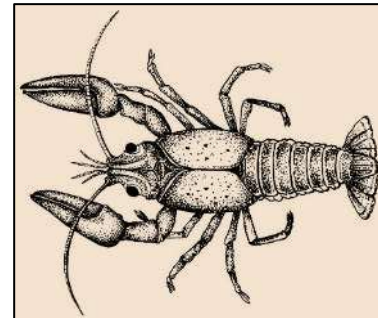
The bubble itself, to this wonderful, composite animal, is four to six inches in length and some three wide and high in its center. The bunch of living polyps beneath, twice that size; while the ravelings, for such they seem to be, hang downwards to from twelve to eighteen inches below the clustered mass above... Investigation proves that this is not a single individual, as would at first appear, but a colony of innumerable zooids, carrying above them, a huge wind bladder -- apparently, only to sustain them just below the surface of the water. The true home of this living, floating island is in the Gulf of Mexico.



A Crawfish

"Crawfish Island Seen," Rome Daily Sentinel, September 8, 1934,

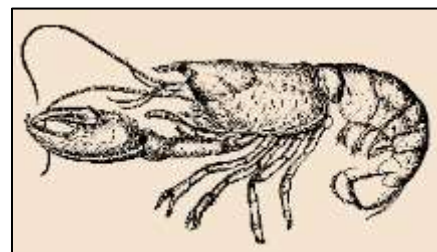
The largest school of crawfish sighted in 15 years was discovered four miles off Santa Cruz Island, Cal., recently. The migrating fish, comprising a thickly packed area of about 100 acres on the surface of the sea, looked like a floating island. The surrounding waters were reported thronged with large brown sharks.



A Lobster

"Wee Lobsters Balk a Ship: Chief Officer of the Charcas Says Liner Grounded on Floating Island," New York Times, February 8, 1912,

When the New York and South American Steamship Company's steamship Charcas arrived at Tompkinsville yesterday from Coronel with a cargo of iron ore and nitrate of silver, Chief Officer Whitan and Chief Engineer Wilson had a wondrous yarn to spin of how the ship was held up at intervals for three days by myriads of tiny lobsters off the west coast of Patagonia.

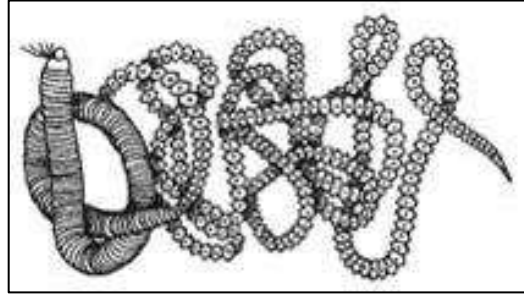


According to the Chief Officer, the Charcas left Coronel on Dec. 13 and on the 23d, nearing the Straits of Magellan, she ran into what appeared to be a floating island of tiny lobsters. They were so thick that the Charcas had 'o force her way through the crustaceous mass for three

days and nights, making a peculiar grating noise which disturbed the engineers in their slumber.

A Palolo Worm

Palolo (*Eunice viridis*) are polychaete worms about 12 inches in length and live in burrows dug into the coral on outer reefs. Their cast-off epitoke segments float to the surface where they disintegrate and cover the water with oily scum.



While "Mid-Winter Days in Monterey, Overland Monthly and Out West Magazine, December 1887, by M.H. Field, provides no positive identification, the "strange white efflorescence" hints of these creatures.

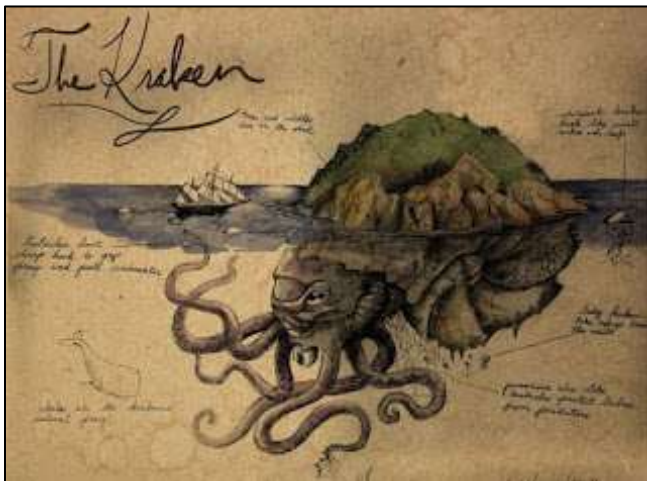
One morning a strange new object was discovered far out towards the ocean. At first it seemed like a long line of breakers suddenly sprung into being, for although it was dark below, the white crest was distinctly visible. Could it be moving? Yes, after a little watching it was seen to be drifting inland. It plainly rose and fell on the billows. It was not the kraken [Chapter 8], unless he has a broad white stripe down his back. The excitement grew. Slowly and steadily it came rocking along, a floating island, -- an island of seaweed, long and narrow, with some strange white efflorescence upon it. Nearer and near it drifted. It was white with seagulls, motionless seagulls, crowded thickly together! It was as picturesque a sight as could be imagined, -- the beautiful creatures riding serenely on their frail raft while the wind blew them steadily shore ward. They did not stir rill their boat grazed a rocky point, when they quietly spread their wings and rose in the air, masters of the situation.

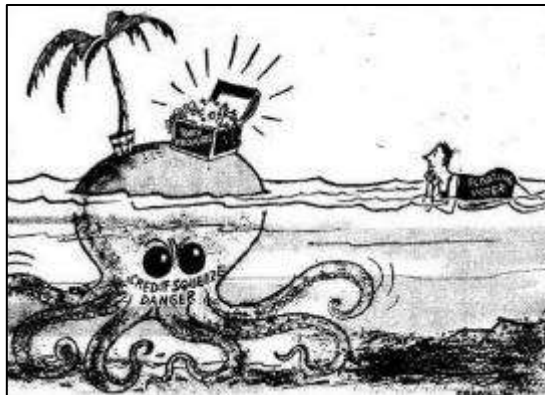
A Seabird

May Goodman, "Birds Over a Winter's Lake," Saturday Review of Literature, January 14, 1950,

The long-winged, silver-mantled gulls, the Bonapartes, the black wing-tipped herring gulls, the graceful ring-bills with the onyx necklace circling their long bills, and with the ducks, the scaups and scoters and spoonbills, the golden-eyes and greenheads, with a feathered isle afloat far out over the lake, a Gulliver's Laputa moving in the distance, only gathered within our view through our powerful binoculars.

A Cephalopoda





"Credit Squeeze Danger,"
Daily Mirror, September 28, 1964

A Creature yet to be Discovered

To this point, all of our creature-constituted floating islands relate to actual sea creatures, or at least those for a time believed to be actual. We've a couple that are more difficult to find in a marine biology reference.

From J.A. Teit's "Water-Beings in Shetlandic Folk-Lore, as Remembered by Shetlanders in British Columbia," Journal of American Folklore 31 (1918),

Several kinds of shapeless monsters have at various times been seen in the sea. One of these was occasionally seen in fine weather. Something like a small floating islet, partly covered with barnacles and seaweed, was supposed to be the back of a huge sea-monster that appeared above water. It was usually very flat, but sometimes humped, or higher in the middle.

An uncle of mine told me of once having seen something of this kind when be- calmed in a smack somewhere in the northeast waters of Shetland. He and his companions observed a very large and flat object in the water some distance off. It was apparently floating, and resembled a flat islet or rock, of perhaps an acre (?) in extent, almost covered with water. Not being able to make out clearly through the glasses the shape and nature of the object, they lowered their small boat, and, taking a gun, three (?) of them rowed up fairly close to it. They did not dare to go too close, but they could ascertain that the monster (or object) was of great bulk and mostly submerged.

Before they returned, one of them shot a bullet into the object, which shortly afterwards sank quietly out of sight. None of the men ever knew exactly what they had seen.

In Days of Magic, Nights of War (2004) by Clive Barker, the heroine washes up on the shores of a mysterious island with a tree and other foliage. She realizes that she must be on a mobile creature instead of a fixed island, because in her world, the latter are frozen at a single hour of the day, and the light changes on this one.



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The Island Fish, Jasconius, from Magic: The Gathering,



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CHAPTER 9 LIGHT NO FIRE

Lighting a fire on a floating island can bring dire consequences, if that island is a whale (Chapter 6), a giant turtle (Chapter 7) or a kraken (Chapter 8).



The Babylonian Talmud's "Rabbi bar Hana's Legends" (c. 280) describes the marvels seen by the rabbi, this one, a meal cooked in the Indian Ocean.

It once happened that I was going on a boat, and saw a fish on which sand was gathered and grass grown thereupon. And we thought that it was an island, descended, baked, and cooked upon it. When the back of the fish grew hot, it turned over, and had not the ship been so near we would have been drowned.

The saga of Sindbad the Sailor is based on the Persian Thousand Tales, known as early as 987 A.D. Sinbad goes to sea and sets ashore on what appears to be an island, but proves to be an aged sleeping whale on which trees have taken root.

For this island whereon ye stand is no true island, but a great fish stationary a-middlemost of the sea, whereon the sand hath settled and trees have sprung up of old time, so that it is become like unto an island. But when ye lighted fires on it, it felt the heat and moved, and in a moment it will sink with you into the sea and ye will all be drowned. So leave your gear and seek your safety ere ye die!"

All who heard him left gear and goods, clothes washed and unwashed, fire pots and brass cooking pots, and fled back to the ship for their lives, and some reached it while others (amongst whom was I) did not, for suddenly the island shook and sank into the abysses of the deep, with all that were thereon, and the dashing sea surged over it with clashing waves.

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"The Whale of Sinbad's First Voyage"
by Maria Pisano

From Al-Jahiz's Book of Animals (9th century),

As regards the Zaratan, I've never met anyone who has seen it with their own eyes. There are sailors who claim to have pushed some islands, seeing wooded valleys and crevices in the rock, and be landed to light a great fire, and that when the heat of the flames had reached the backbone of Zaratan, this has begun to plunge in the water with them over him, and with all the plants that grew there, until only those able to swim were able to save themselves. This exceeds even the most courageous and imaginative fictions.

And just what is a Zaratan? Zakariya al-Qazwini, in The Wonders of Creation (13th century) deems the creature to be a tortoise.

We found in the sea an island elevated above the water, having upon it green plants; and we went forth to it, and dug [holes for fire] to cook; whereupon the island moved, and the sailors said, Come ye to your place; for it is a tortoise, and the heat of the fire hath hurt it; lest it carry you away! By reason of the enormity of its body. It was as though it were an island; and earth collected upon its back in the length of time, so that it became like land, and produced plants.

Sahriyar ar-Ramhurmuzi's Livre des Merveilles de l'Inde (probably 10th century), is thought to have been one of the sources of the Sinbad stories.

I have also heard very curious stories about turtles, which the mind has difficulty in crediting. Here is one that I have from Abu Mohammed-al-Hagan, son of Amr. He had heard a respectable sailor relate that a ship, sailing from India for some country or other, was driven from its course by the violence of the wind, notwithstanding the efforts of the captain, and sustained some damage. They finally reached a little island, entirely destitute of wood and water, where they were forced to stop. The cargo was unloaded, and they remained there long enough to repair the damage, after which the bales were put back on board, in order that they might continue their journey.

While this was in progress, the New Year festival arrived, and, in order to celebrate it, the passengers carried ashore to the island such pieces of wood, palm-leaves, and rags as they could find aboard ship, and set them on fire. Suddenly the island shook beneath their feet. Being near the water, they threw themselves in, and made for the small boats. At that instant the island sank into the waves, producing such a swirl that they all narrowly escaped drowning, and only saved themselves with the greatest difficulty, being terrified beyond measure. Now the island was nothing but a turtle asleep on the water, which, awakened by the heat of the fire, sought to escape.

I asked my informant how that happened. "Every year," he replied, "there is a number of days when the turtle rises to the surface of the water to rest from his long sojourn in the caverns of the submarine mountains; for at these depths there grow frightful trees and prodigious plants, much more wonderful than our terrestrial trees and plants. It comes, then, to the surface of the

Chapter 9 -- Light No Fire

water, and passes whole days there deprived of sensation, like a drunken man. When it has regained its senses, and becomes tired of its position, it dives."

Mardiros Ananikian's Armenian Mythology: Stories of Armenian Gods and Goddesses, Heroes and Heroines, Hells & Heavens, Folklore & Fairy Tales (2010). Keresaspa is the Avestan name of the monster-slaying hero Garshasp in Iranian mythology.

When the floating island (sea-monster) upon which Keresaspa had unwittingly kindled a fire, sank and the fire fell into the water, this was accounted to him a great sin.

The Physiologus, a natural history text by an unknown author, originally written in Greek during the 2nd Century, was translated into Latin in the early 8th century.

There is a monster in the sea which in Greek is called aspidochelone, in Latin "asp-turtle"; it is a great whale that has what appear to be beaches on its hide like those from the seashore. This creature raises its back above the waves of the sea, so that sailors believe that it is just an island, so that when they see it, it appears to them to be a sandy beach such as is common along the sea-shore. Believing it to be an island, they beach their ship alongside it, and disembarking, they plant stakes and tie up the ships. Then, in order to cook a meal after this work, they make fires on the sand as if on land. But when the monster feels the heat of these fires, it immediately submerges into the water, and pulls the ship into the depths of the sea.

By the 10th century, the Physiologus was widely distributed throughout Europe, forming the basis of a genre that continued into the 15th century, the "bestiary."

From the Anglo-Saxon, "The Whale," Codex Exoniensis (10th century),

Concerning the great Whale, which is unwillingly often met, cruel and fierce to seafarers, to every mortal, to which the name is given, to the ocean- floater, Fastitocalon.

Like is its aspect to a rough stone, it, as it were, roves by the seashore, by sand-hills surrounded, of sea-aits greatest: so that imagine wave farers, that on some island they gaze with their eyes, and then fasten the high-prowed ships to that false land with anchor ropes, settle their sea-horses at the sea's end, and then on to that island mount, bold of spirit: the vessels stand fast by the shore, by the stream encircled : then encamp, weary in mind, the seafarers, (they of peril dream not) on that island ; they waken flame, a high fire kindle; the men are joyful, the sad in spirit of rest desirous.

When feels the skilled in guile, that on him the voyagers firmly rest, habitation hold, in the weather exulting, then suddenly into the salt wave, with the bark, down goes the ocean's guest, seeks the abyss, and then, in the hall of death, to the flood commits ship with men.

The Old English poem "The Whale," from the latter 10th century,

Seafarers often meet him by accident -- he's called Fastitocalon -- dangerous and spirit-grim, he who floats on ancient streams. His look is like rough stone, the greatest sea-bank crumbling near the water's edge, clothed in sand dunes so that seafarers think they are looking at some island.

Men moor their high-prowed ships with anchor-ropes to the false land, the un-land, settling their sea-steeds at the water's end and going boldly upon that island. Encircled by the current, the ships remain secure near the shore.

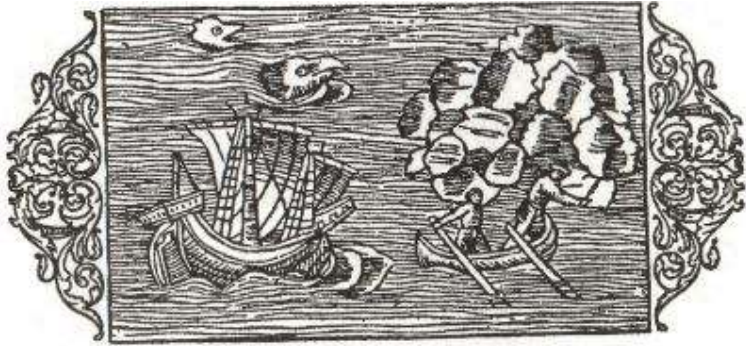
The weary-spirited seafarers, expecting no danger, make camp on that island, lighting a flame and kindling a high fire. Tired but happy, they are ready for rest.

When the deceit-crafty one senses the travelers are secure upon him, keeping camp, wishing for fair weather, down he plunges -- all at once -- on the salt-way. The ocean's gast goes to ground with his plunder, delivering ships with their drowned to the death-hall.

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From A Description of Northern People (1555) by Olaus Magnus,

The whale's skin has a surface which looks like sand on the seashore. Hence, when it raises its back above the waves, as it frequently does, sailors completely mistake it for an island.



So, they put in, disembark, drive stakes in to tie their vessels to, and kindle fires to cook their food, till the whale, at last feeling the heat, plunges into the depths. Then those who remain on its back are drowned, unless they can rescue themselves with ropes extended to them from the ship.

Sometimes it takes up sand on its back, so that when a storm is brewing (as you may read in the book On Nature [1244, by Vincent of Beauvais]), sailors will rejoice at discovering land, drop anchor and take their rest, falsely trusting its stability. As soon as the monster feels the fires they have lit, with a sudden movement it dives down into the waters..

The blessed Jerome says that whales and turtles rise up so prominently through their vast size that they can serve as islands where ships may ride at anchor.

From Bestiaire (1570) by Philippe de Thauin,

Cetus is a great fish which most people call whale. This fish raises his back in the high sea and will lie so long in one place that the wind brings sand and spreads it on his back and thereon grow trees and little shrubs. Seafarers are often deceived by it, for they think that it is an island where they land and drive stakes and make a fire to prepare their meals, but when the fish feels the heat he cannot, bear it, but will plunge down to the sea and drown all that he has on him.

We met St. Brendan, in Chapter 3. Brendan's tale is recorded in Navigatio Sancti Brendani (10th or 11th century), was adapted into the South English Legendary (13th-14th century)

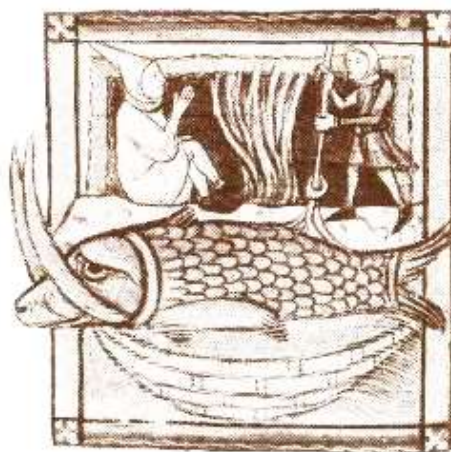
They came to a great isle, and through our Lord's grace their ship drove onwards towards it; but before they could make landfall they came to some protuberance that prevented them from running the boat ashore. One of Brendan's monks waded onto the land, but Brendan and the others remained in the ship. This monk began to prepare a meal from the food he had brought with him, made a fire and boiled some fish in a cauldron. But before it was cooked, before the fire had heated the water even, the island began to move up and down. The monk was scared out of his wits and Saint Brendan watched in amazement as the island began to hurtle through the water, moving up and down like a living thing. It swam for more than two miles before casting the fire into the sea. The monks cried out to Saint Brendan to explain what was going on.

"Be still," said this good man, "and have no fear. You think it is an island, but you are all wrong. It is a fish of this great sea, the greatest that there is.."

The Brendan narrative is somewhat more benign than many of fire-on-the -floating-island-tales, as this creature does not dive with all on board.



Carving of in Washington National Cathedral



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"The Whale" *Bestiary* (1022-1035), Bishop Theobald

*The ocean-swimmer, Fastitocalon.
Dun, like rough stone in color, as he floats
He seems a heaving bank of reedy grass
Along the shore, with rolling dunes behind,

So that sea-wanderers deem their gaze has found
An island. Boldly then their high-prowed ships
They moor with cables to that shore, a land
That is no land. Still floating on the waves,

Their ocean-courers curvet at the marge;
The weary-hearted sailors mount the isle,
And, free from thought of peril, there abide.
Elated, on the sands they build a fire,

A mounting blaze. There, light of heart, they sit --
No more discouraged eager for sweet rest.
Then when the crafty fiend perceives that men,
Encamped upon him, making their abode,

Enjoy the gentle weather, suddenly
Under the salty waves he plunges down,
Straight to the bottom deep he drags his prey;
He, guest of ocean, in his watery haunts
Drowns ships and men, and fast imprisons them
Within the halls of death.*

"Fastitocalon" (1927), J.R.R. Tolkien

*Look, there is Fastitocalon!
An island good to land upon,
Although 'tis rather bare.
Come, leave the sea! And let us run,
Or dance, or lie down in the sun!

See, gulls are sitting there!
Beware!
Gulls do not sink.
There they may sit, or strut and prink:
Their part is to tip the wink,

If anyone should dare
Upon that isle to settle,
Or only for a while to get
Relief from sickness or the wet,
Or maybe boil a kettle.*

But for every rule, there is an exception, for which we cite two examples.

"Tales of the Times: The Man from Jersey Tells a Few Stiff Yarns on the Fishing Question," *Olean Democrat*, June 18, 1895, is about a fisherman who builds a hut on an islet in the Passaic. One morning he finds that his islet is floating downriver, and moreover, that the islet is a giant sea turtle. Having a degree of commercial acumen, he proceeds to cut a hole in the turtle's shell, lowers his stove into the hole, adds water, salt and vegetables, and makes turtle soup which he then sells when the turtle comes ashore in Newark;

Last fall Johnny was about 20 miles up the river when cold weather overtook him, but he decided to stay right there until spring. He looked around for a place to build a cabin and found a hard, dry little Island not more than 30 feet across, lying right in close to the shore. A long plank would serve as a footbridge from the bank of the river to the island.

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It was just the place he wanted, and, getting some old planks together, he built a neat little hut out on the island, put in a stove and settled there for the winter. He tried the fishing in May, but it was too cold, and they did not bite fast enough to suit him, so he went back into winter quarters and stayed there until the warm spell came along last week. Then he went to work to get his lines ready for the work of the summer.

Well, you can't imagine how surprised Conway was the next morning when he awoke and found himself, cabin, island and all, out in the middle of the river and five miles below the spot where he had spent the winter.

He rushed out of his cabin to investigate and found that the little Island which he had pre-empted for his own was slowly drifting down the river toward the sea.

Looking closely at the sides of the moving island, he saw what appeared to be clumsy propellers of some sort. A further investigation revealed the fact that he was afloat in the middle of the river on the back of a huge sea turtle. The turtle probably got caught far up the river by the cold weather and laid up there half frozen until the hot spell last week thawed it out, and then it started back toward the sea as fast as it could go with Johnny Conway and his cabin on its back.

Now, Johnny is one of those fellows who always have an eye on the main chance and never let a good thing pass him on a down grade. He did not study over his situation more than five minutes before he went to work.

Taking his ax, he chopped a hole through the shell of the turtle right in the middle of the back. Then, with a knife, he cut away a lot of flesh, after which he let his stove down into the hole. Building a roaring hot fire in the stove, he poured a lot of water into the hole, put in some salt and vegetables, and in an hour he had ten barrels of as fine turtle soup as you ever tasted.

He made it warm for the turtle, however, and the animal turned in to the shore at Newark to fight the fire that he must have felt raging inside him. Well, the turtle ran on a mud bank close to the shore and stuck there.

Now what do you suppose Johnnie did? Why, he ran out his gangplank to the bank of the river and put up a sign over the door of his cabin:

*Hot Turtle Soup.
Right Off the Turtle.
Only Ten Cents a Plate!*

And last, we have the Disney 1940 movie Pinocchio, where Monstro -- "a whale of a whale. He swallows whole ships!" -- has swallowed most of the cast. Pinocchio proposes lighting a fire to make their captor sneeze. When Monstro finds smoke rising from his blowhole, he does so, expelling the captives onto the sea.



And with a wooden puppet who dreamed of becoming a real boy, we'll end our chapter.

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CHAPTER 10

ACT LITERATE

The chapter at hand deals with works written for adults. Adventure tales aimed at younger readers is the subject of Chapter 11.

Naturalists' reports may not be where we'd look for prose, we'll dispel that misconception with a report on the Okefenokee Swamp from North With the Spring (1951) by Edwin Way Teale, and its quotation from Guy de Maupassant.

At each footfall nearby plants and bushes quivered. I stamped my foot and the tremors of a miniature earthquake spread away across the vegetation like ripples on water. In some parts of the Okefenokee high trees are set quivering by the stamping tread of a man below. In the days of the Seminoles the swamp was the Land of the Trembling Earth. It still is.

While the Okefenokee has isolated areas of solid land, such as Billy's, Black Jack, and Bugaboo islands, most of it, like the prairies tremblantes of the Cajuns, is unstable, watery semi-land. Its depths present such eerie sights as will-o-the-wisps and marsh-gas blowups and such visions of beauty as acres of blue flags blooming at once. Its dark lakes, its islands, its quaking prairies, its "houses" of massed vegetation, each has its own special inhabitants. Sandhill cranes nest on the prairies, their trumpeting carrying far over the lonely stretches. Since 1937 the Okefenokee has been a federal wildlife refuge. In a country where 100,000,000 acres of marshes already have been drained, this greatest swamp of the eastern seaboard promises to retain permanently the fascination of the untamed.

Guy de Maupassant, perhaps, has touched the secret. "Nothing," he writes in his short story Love, "is more troubling than a morass. Is it the vague rumor of the reeds, the strange jack-o'-lanterns, the profound silence that causes the morass to resemble some dream country hiding a secret, impenetrable and dangerous? No: another mystery floats in the thick fog, the very mystery of creation, perhaps! For was it not in the stagnant, muddy water, in the heavy humidity of saturated lands, under the heat of the sun, that the first germ of life moved, vibrated and opened itself to the light?"

Writers have long applied their creativity to accounts of floating islands. Lucian's Vera Historia, for example, describes a fantasy battle among giants sailing on floating isles. Note the employment of devilfish, dolphins, oysters and even a whale.

We saw the most unparalleled of all the sights that ever I saw -- huge men, fully half a furlong in stature, sailing on huge islands as on galleys. Though I know that what I am going to recount savors of the incredible, I shall say it nevertheless. There were islands, long but not very high, and fully a hundred furlongs in circumference, on each of which about a hundred and twenty of those men were cruising, some of whom, sitting along each side of the island one behind the other, were rowing with huge cypress trees for oars -- branches, leaves and all!

In lieu of sails, the wind struck the forest, which was dense on each of the islands, filled this and carried the island wherever the helmsman would. There were boatswains in command, to keep the oarsmen in time, and the islands moved swiftly under the rowing, like war-galleys.

At first we only saw two or three, but later on about six hundred made their appearance. Taking sides, they went to war and had a sea-fight. Many collided with one another bows on, and many were rammed amidships and sunk. Some, grappling one another, put up a stout fight and were slow to cast off, for those stationed at the bows showed all zeal in boarding and slaying: no quarter was given. Instead of iron grapnels they threw aboard one another great devilfish with lines belayed to them, and these gripped the woods and held the island fast. They struck and wounded one another with oysters that would fill a wagon and with hundred-foot sponges.



1647 Illustration

Their battle evidently came about on account of an act of piracy: Brinedrinker was said to have driven off many herds of dolphins belonging to Aeolocentaur. We knew this because we could hear them abusing one another and calling out the names of their kings.

Finally the side of Aeolocentaur won; they sank about a hundred and fifty of the enemy's islands; and took three more, crews and all; the rest backed water and fled. After pursuing them some distance, they turned back to the wrecks at evening, making prizes of most of them and picking up what belonged to themselves; for on their own side not less than eighty islands had gone down. They also made a trophy of the isle-fight by setting up one of the enemy's islands on the head of the whale. That night they slept on shipboard around the animal, making their shorelines fast to him and riding at anchor just off him, for they had anchors, large and strong, made of glass.

Shakespeare's The Tempest (1611) is set upon an island perhaps in the Mediterranean, perhaps in the New World. The critics can't agree. Since the shipwrecked characters were travelling between Naples and Tunis, the island would seem to be in the Mediterranean. But Ariel's reference to "the still-vex'd Bermoothes" seems to refer to the New World. Shakespeare would have been familiar with the William Strachey's A Discovery of the Bermudas, Otherwise Called the Isle of the Devils (1610), the tale of the Virginia Company's expedition to Jamestown that lost its flagship in 1609, the crew found a year afterwards, having been in Bermuda.

That the island -- wherever it may be -- seems well planted, however, hasn't dampened Shakespearians who take the Bard more metaphorically. Do not contradictory hints as to the island's location, they ask, reveal that the setting is unfettered by the bounds of geography? A "floating" island, might we say?

From Jean MacIntyre, Enchanted Islands Floating in the Foam of a Perilous Sea, "Quidditus" 26&27, 2005-2006

These floating islands (visibly mobile or not) exploit the commonplace that insular Britain was a world apart, mythologized as a "demi-paradise" and protected by the sea from "the envy of less happier lands."

The Tempest and New World-Utopian Politics (2012) by Frank Brevik,

Real geography thus becomes fictional... so translating the island from the world of its named places into a floating island like those in masques, findable only by the witch Sycorax on the Argier ship, or by the white magician Prospero in the Milan hulk.

Perhaps we keep producing the plays to figure such things out.

Rowing up the Merrimack River in 1839, Thoreau and his brother John stopped to rest at the mouth of Salmon Brook. From A Week on the Concord and Merrimack Rivers (1867),

We rowed up far enough into the meadows which border it to learn its piscatorial history from a haymaker on its banks. He told us that the silver eel was formerly abundant here, and pointed to some sunken creels at its mouth. This man's memory and imagination were fertile in fishermen's tales of floating isles in bottomless ponds, and of lakes mysteriously stocked with fishes, and would have kept us till nightfall to listen, but we could not afford to loiter in this roadstead, and so stood out to our sea again.

Floating mires are sometimes mistakenly perceived to be remnants of undisturbed wilderness. Thoreau believed the rain-fed Gowing's Swamp (now known as Thoreau's Bog) to be such a place, "as purely primitive and wild as they were a thousand years ago, which have escaped the plow and the axe and the scythe and the cranberry rake, little oases of wilderness in the desert of our civilization," quoting from Wild Fruits (not published until 1999). In reality, the mire likely formed less than 500 years ago after the site was highly reworked by glaciation.

"Silkeborg: A Picture of Danish Scenery," The Knickerbocker; or New York Monthly Magazine, August 1857, is by Hans Christian Andersen, but it's not "The Little Mermaid."

Forest tracts, unbroken by road or foot-path, encircle deep lakes. Upon one of these is seen a small floating island, shaded by a solitary tree that bends low upon it. Hither and thither it drifts, the sport of the wind. They tell us that a stranger once came to this dark, still water; deeply impressed with its melancholy character, he returned seek death in its unfathomable depths.

The Surprising Adventures of Baron Munchausen (1895) by Rudolph Raspe, the Baron pegs down an otherwise-rogue Caribbean floating island, what was the British Crown Colony of Saint Christopher-Nevis-Anguilla and today is the dominion of Saint Kitts and the British Overseas Territory of Anguilla.

Our company immediately embarked in the machines before described, in which we had journeyed into Africa, and after a few days' sail arrived in North America. We met with nothing curious on our voyage, except a floating island, containing some very delightful villages, inhabited by a few whites and negroes; the sugar cane did not thrive there well, on account, as I was informed, of the variety of the climates; the island being sometimes driven up as far as the North Pole, and at other times wafted under the equinoctial. In pity to the poor islanders, I got a huge stake of iron, and driving it through the center of the island, fastened it to the rocks and mud at the bottom of the sea, since which time the island has become stationary, and is well known at present by the name of St. Christopher's, and there is not an island in the world more secure.

"Cast on a Floating Island: Westerner Tells of his Remarkable Experience in the South Pacific," Washington Post, December 13, 1908, is a humorous tale about a man marooned on a floating island having coconut trees and guess what else?

Fore I knowed exactly what I was up against a whoppin' big wave comes aboard, takes me clean off my feet and drops me kerchug right down in the middle o' the ocean.

When I come to the top an' got the salt out of my eyes that blamed boat was 10 miles away an' gettin' further every second. Guess they didn't even know I'd got off at that station. An' there was I, a-splashin' aroun' all by myself on the big water -- an' me a wearin' a full-dress suit. I ain't much of a swimmer, an' even if I had been I couldn't a done much with them big waves givln' me a biff every other minute. But I had my hands stretched out in front of me, maken' the stiffest fight I could, when, zip! somethin' slipped over 'em. an' blamed if it wasn't a life preserver. I had just sense enough left to fasten it tinder my arms, when I guess I must a gone to sleep.

Chapter 10 -- Act Literate

Sometime after that -- don't know whether, it was 10 hours or 10 days -- I opened my eyes and found I'd butted into land. At least I was on the edge of it, the root of a tree was hooked under my vest, an' I was hangin' there with my head an' shoulders, just above water.

Well, I climbed up on the brink an' took a look at the place. I could see all over it at one look, for there wasn't more'n acre of it. Right in the middle was a couple o' cocoanut trees chuck full o' nuts. There's somethin' to eat an' somethin' to drink, too, I says to myself, an' makes for 'em. There was all kinds o' plants on the Island, an' around the trees was some kind of a long grass with blades as broad as corn. That grass patch was as high as my head an' I had to break through to get to the trees, an' when I got through what do you reckon I saw? You couldn't guess in a thousand years-, so there ain't no use to try.

The trees was in a little clear space, an' settlin' right between 'em was -- was -- a woman.

We, of course, read on.

Yes, sir, a woman -- a lady. Wasn't no chocolate-colored damsel with a necklace an' a coat o' grease. No, siree. She was white -- white as they make 'em -- one o' these, yellow-headed girls complected like strawberries an' canned milk.

But it seemed like the weather had it in for us good and hard. One night about three weeks after I landed there, I woke up an' found we was spinnin' around like a top. There was a terrible wind blowin' an' the sky an' the sea seemed to be just a boilin'. I got outside my tent an' was startin' to crawl on my hands an' knees across the open space to get to the girl -- I couldn't stand in that wind -- when ell of a sudden that island split right in two in the middle, leaven' me on one half an' her on the other. Before you could say Jack Robinson we was a mile apart. An' that's the last I ever saw of the other halt or the girl. The very next day a ship came in sight an' took me off, and -- and -- that's all.

"The Floating Island," Overland Monthly and Out West Magazine, July 1912, by Catherine Canine, involves a parcel of land torn loose in California that drifts to the Mexican *Islas de Revillagigedo*.

"This is not solid ground at all -- that it's an island formed of floating bits of -- what did he call it. Oh, Sphagnum! Marsh grasses took hold first, then bigger water plants, and then all this other vegetation. He says there was another such island in the Atlantic in 1892."

We'll visit the sea-borne island of 1892 in Chapter 49, an isle of perhaps exaggerated reports, but not one of fiction.

After she returned from Annette's room nothing was heard but the waves and the wind. "We're not afloat now," she told Ruth. "This trembling is probably due to wave concussion. That's doubtless nonsense, anyway, about this land being a sphagnum formation. It may last a hundred years; but it's all too glorious to let one sleep."

Dawn saw the sea soothed, softened. Hastily Isabel and Ruth walked east, toward the mainland. Soon they had another and unaccustomed view of the ocean, which was now streaked with bronze, turquoise and rose. In the distance across the glowing water were trees and the lines of a ragged coast. They faced each other in pallid consternation. They turned again toward the slowly receding land. With white lips, Ruth said: "Adrift!"

Isabel did not speak until she could command her voice. "Our state is not so desperate," she said. "The island which floated in the Atlantic in '92 rode the waves over a thousand miles without going to pieces -- perhaps we shall anchor on a projecting coast or on another island." The girl stood motionless. "There were about three acres in that, with trees thirty feet high," Isabel continued. "Our trees are still larger and probably their strong roots will hold the surface for a long time. And we've a much bigger chunk of land to start with."

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Isabel and Ruth sat still looking westward. "How long did the Atlantic island last?" the girl asked at length. "It was known to have floated for two months. When last seen it had passed through a heavy storm. Eventually it may have reached the coast of Europe."

"How do we know," she said, "that we may not anchor on some uninhabited isle and remain there till we're gray?"

The Great Grimpen Mire, as described in "The Hound of the Baskervilles" (1901) by Arthur Conan Doyle,

Rank weeds and lush, slimy water plants send an odor of decay and a heavy miasmatic vapor into our faces, while a false step plunged us more than once thigh-deep into the dark, quivering mire, which shook for yards in soft undulations around our feet.

Another body-under-a-floating--island story is Oscar Masse's "L'île Errante de Waterloo," Masse... Doine (1930) is a fictional account of how a wandering Jew, Samuel Laxtham, was killed by wolves and buried at the edge of the Waterloo Lake on a parcel which in 1812 broke free to become such an island.

"The Floating Island," The Birch and the Star and Other Stories (1915) by Zacharias Topelius and Jorgen Moe,

Anne knew all about the floating island, it had been on the lake for many years, she said. But there were many strange things about it.

Every time there was to be a fine year for the farmers the island was green all summer, but if there was to be a bad year the grass on it grew yellow and brown and there were but few leaves on the little birch. Yes, old Anne would not be surprised if there appeared blood red spots on the island in years of warfare and trouble.

Every year there was a loon's nest there, and Anne had her own opinions both of the loon and the island, but when Beate wanted to know more, old Anne only shook her head, for she was not the kind that told everything she knew.

But one thing she would toll and that was, that if anyone stood on the floating island and took a loon's egg out of the nest and wished for something, that wish would come true, if the egg was put safely back into the nest again. If you wished to become the Princess of England your wish would indeed be fulfilled, said old Anne. But there was one more thing to notice; you must not talk about it to a living soul.

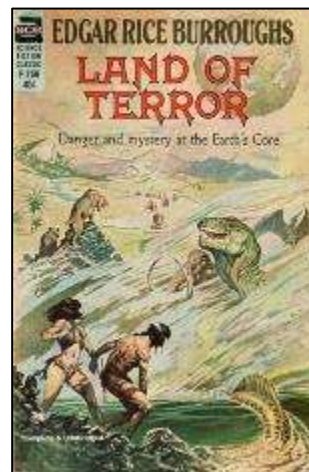
Edgar Rice Burroughs' Land of Terror (1944), book 7 in the Pellucidar series, introduces floating islands in a metaphoric manner.

I could see islands far out upon its bosom, isles of mystery whose secrets I could never know. What strange men and beasts inhabited those emerald gems floating upon the azure sea? The inaccessible and the unknowable always intrigue my imagination; and once more I determined, as I had often before, that if I were fortunate enough to return to Sari, I would build a seaworthy vessel and explore the waters of Pellucidar.

But, as Burroughs is prone to do, what begins as thought soon becomes real. A few excerpts:

"That is very strange," he said. "It is a most important island --- one of the Floating Islands."

"And where are they?" I demanded.



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"Now where would an island float?" he demanded. "In the sea, of course."

"But what sea, and where?" I insisted.

"The Bandar Az," he explained. "What other sea is there?"

"If you live on an island, how do you happen to be a prisoner here on the mainland?" I asked.

"Well, sometimes Ruva floats near the mainland; and when it does we often come ashore to hunt for meat, of which we have little on the island, and to gather fruits and nuts which do not happen to grow there. If we are lucky, we may take back a few men and women as slaves. I was hunting on the mainland when I was captured."

A bit later,

"The last time I looked out across this water, there were islands out there. I saw them distinctly. I could not have been mistaken."

"You were not mistaken," said U-Val. "They were The Floating Islands, of which Ruva is one."

Now here was a new phase of that amazing homing instinct which is inherent to all Pellucidarians. Here was a man whose country floated around aimlessly, possibly, upon a great ocean, at the mercy of tide and current and wind; yet no matter where it might be U-Val, given means of transportation, could go directly to it, or at least so he thought. I wondered if it were true.

We sailed on; and even though U-Val saw no land he held our course straight for that distant smudge that slowly took more definite shape, a fact which assured me that it must be the floating island of Ruva. Again, as I had a thousand times before, I marveled at that amazing instinct, inexplicable alike to those who possess it and to those who do not. How can it be explained? I haven't even a theory.

As we neared the floating island of Ruva it appeared as low, level land, thickly grown with trees. It floated low in the water, its upper surface scarcely more than five feet above the waterline; and nowhere could I detect any sign of hills. The coast directly in view was irregular, being broken by small inlets or bays; and into one of these U-Val steered our craft. I took down our sail, and he paddled to shore.

The trees, of no great size, grow close together. They are of a species I had never seen before, as soft and spongy as some varieties of cactus but without spines or thorns. It is these trees which really not only make The Floating Islands, of which Ruva is one, but also make them a fit abode for human beings. The roots of the trees, closely interlaced, keep the islands from disintegrating and form a natural basket which holds the soil in which the vegetation grows.

And what's more Burroughs than rescuing a maiden?

"That is a good idea," said U-I-Van; "but we shall have to wait until the islands float within sight of the mainland."

"Bandar Az is very large," he said, "and the islands are constantly drifting. We never go to the mainland unless we can see it. Of course, it makes no difference then how far Ruva drifts away from us, for Ruva is our homeland; and no matter where it lies, we can always return to it."

But how was I to rescue her? First I would have to reach Ko-va, and that I could not do alone for it had drifted out of sight of Ruva. Usually, U-I-Van said, they were in sight of one another; but some freak of current or wind had separated them. Eventually they would float together again. On occasions they had even touched each other. Formerly the fighting had been continuous when this occurred; but both tribes had been so depleted by this constant warfare that, for many generations, truces had been declared whenever the two islands approached within spear-throw of each other.

And of what book-sales value would be a rescue without grave danger?

As we came closer, I witnessed a strange and terrifying sight. The entire island, as far as I could see, was rising and falling as though in the throes of a terrific and continuous earthquake. Mountainous waves were breaking on the low shoreline and carrying tons of water into the forest. Pieces of the island were breaking off and disintegrating. How could we hope to make a landing under such conditions? And then Ro-Tai voiced that very doubt.

My fear was that the entire island would disintegrate. I did not see how it could withstand the terrific forces that were wrenching at it, pulling it this way and that, raising and lowering it, twisting and turning it. I asked Ul-Van what he thought our chances were.

"I have seen but one such storm before in my lifetime," he said. "Portions of the island were broken off and lost; but the main part of the island withstood the worst that wind and sea could do. If the storm does not last too long, I think that we are safe."

"Adrift on a Floating Island," Wide World Magazine, December 1950, relates author Willard Price's adventure in the Amazon when canoe capsized, forcing and his companion to take refuge on a half-acre floating island, from which they were eventually rescued.

The Egghead Republic: A Short Novel from the Horse Latitudes (1979) by Arno Schmidt is a Swiftian record of a journalist who has a 50-hour pass to visit the Egghead Republic (or International Republic for Artists and Scientists), a floating island three miles long and half as wide, created for genius to flourish, unhampered by economic straits or threats of war.

As "Balancing Acts," Sewanee Review, Summer 1998, deals with walking on a floating island, it could go in Chapter 37, but as Robert Benson is an acclaimed writer, we'll put his piece here.

In the summer I learned a little about walking in the marsh on the floating mat of vegetation called the trembling prairie, the flotant; and I listened to many unsentimental stories of a vanishing world, a world whose tangible traces I saw all through the marsh; abandoned winter camps of trappers, rotted pirogues disappearing slowly into the mud, the remains of a rough planked dock, and occasionally a forgotten trap still staked, but long since sprung and rusting at the edge of a muddy slough.



The first morning I stepped off the crew boat onto what looked like solid ground, I sank through the floating mass up to my hips. The rest of the crew stood laughing, the tops of their shoes still dry.

"Hey, city boy," Landry said, "what you doin' down der?"

"You got to stay on top de marsh to walk," Harry LeBlanc added.

C.J., who was the surveyor, was laughing too hard to say anything, but he gave me a hand and pulled me up. When I put weight on it, my right foot sank back as far as my knee. C.J. still had me by the hand and pulled again.

"Shit, boy, you ain't come out here to swim, no. Hoi' your feet so they don't take all your weight."

That advice makes no more sense to me now than it did the first time I heard it, and it was like the other bits of coaching I received: offered generously, but finally mysterious and untranslatable. I felt heavy and uncoordinated, the spastic member of a ballet troop. Harry LeBlanc tried to demonstrate how to walk the marsh by holding both hands out in front of his chest and moving them as if they were feet.

"Do like dis here," and he would move first his right hand and then his left. It looked to me like any attempt to describe any sort of walking. No help. Day after day I fell through the marsh again and again. Most days I worked soaking wet, covered with stinking mud. Other members of the crew were only wet with sweat. During lunch break after a week or so, I told Parrison Landry I didn't think I'd ever get the hang of it. Parrison was the best marsh-walker on the crew, and everyone acknowledged his superior skill. In particularly bad stretches of marsh where there was more water and less vegetation, Landry was the one who went ahead and found a route that most of the crew could follow. On a couple of those occasions everybody but Landry got wet. Those were the times I could only tag along by swimming and crawling. Landry got to laugh at everybody.

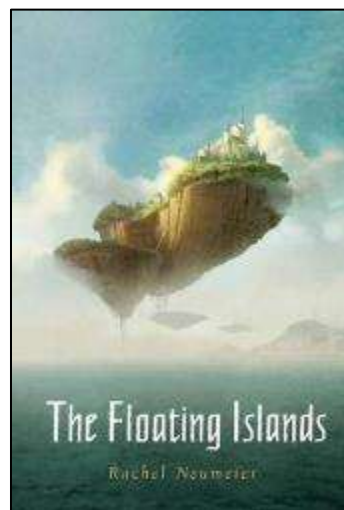
"Listen, Banson," Landry said, "you got to walk like a cat." He fixed me with his eyes and added without irony, "Slow and fass at the same time."

I think I could see it when Landry did it, but I was not a quick study and never really got the hang of it. The most difficult walking involved crossing canals and sloughs that were being choked by grass floating in on lumps of dirt the crew called heads. These lumps had not yet rooted themselves to the body of the marsh. Stepping onto these heads was a little like stepping onto any kind of floating ball. As soon as you put your weight onto the lump of grass, it sank and shifted wildly. I watched Landry lead the crew across several of these sloughs. His balance and timing were perfect. Each step seemed calculated and deliberate, and yet he moved with such speed and grace that it also appeared as spontaneous as running.

The Floating Islands (2011), by Rachel Neumeier, revolves around a nation of floating islands to which the protagonist flees. Granted, it's a sky island, and thus not within our stated scope, but the writing's worth making an exception.

Before them, the Islands rose shimmering out of the dawn mist. They stood high above the sea -- too high, even in that first mist-shrouded glimpse.

Each of the Floating Islands was broad on top, narrowing to points of jagged rock below. Trei found a place to sit among coiled ropes, near the bow of the ship, out of the way of the busy sailors. He propped his chin in his hands and watched the Islands grow larger as the morning passed. They only seemed more astonishing as the ship approached them. Trei could have believed that someone had painted them on a backdrop and the ship would eventually tear through the canvas to find waiting, a far less magical scene.



Drifting mist, contorted trees growing directly out of the rock, gulls' nests, and the odd vein of white marble, all so high above there would have been room below for masts five times the height. Barely audible beyond the shrill cries of the gulls came the delicate thread of some unearthly melody

The islands proved to be farther away than Trei had first thought all morning, while the dawn cool gave way to the heavy southern heat, the ship sailed toward the nearest of the Islands, drawing close at last only as the sun crested in the sky.

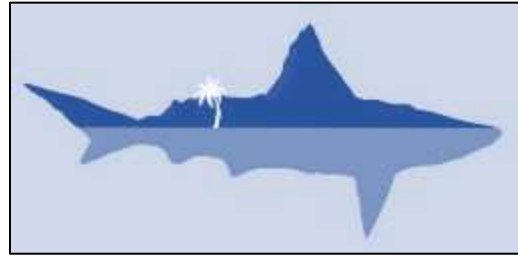
Trei craned his neck back and stared upward as they passed under the Island Drifting mist, contorted trees growing directly out of the rock, gulls' nests, and the odd vein of white marble, all so high above there would have been room below for masts five times the height. Barely audible beyond the shrill cries of the gulls came the delicate thread of some unearthly melody.

So walk carefully -- this is a fragile place, and unlike other islands, it is not connected to any ground below the sea. We don't want to up-end it, now, do we?

The setting of Tim Jackson's short story collection, Tales From Blacktip Island (2014) provides a location for the author's ongoing blog.

Winter waves threaten to break Blacktip Island from its base

Scientists Thursday confirmed Blacktip Island will soon break free of its deep-sea base following recent winter storms.



"A combination of ocean acidification and deep ocean waves have been gnawing away at the island for years," Tiperon University at Blacktip marine geologist Ernesto Mojarra said. "This is soft limestone. It doesn't hold up.

"The erosion's most noticeable around the 100-foot depth. If you took a cross-section of the island all the way up from the sea floor, the exposed land would look like a lollipop on a needle-thin stick. It's only a matter of time, a very short time, geologically speaking, before that sucker breaks off," Mojarra said.

"What happens then is anyone's guess. The island could sink, what, 6,000 feet straight down. Or, given that it's porous limestone with lots of air pockets, it could very well float. There's no precedent."

Government plans to chain the island to its base proved impractical. Instead, authorities have stitched together a giant sail, to be raised on the cell tower at the island's center, and are submerging a warehouse door to act as a rudder at the island's northern tip.

Blenny and other residents are stuffing island sinkholes with Styrofoam and boat fenders to increase the island's buoyancy.

"We're selling Under-Island Diving specialty courses like crazy," Club Scuba Doo dive operations manager Finn Kiick said. "This is the only place on Earth you can be certified to look at the bottom of an island. We charge accordingly, of course."

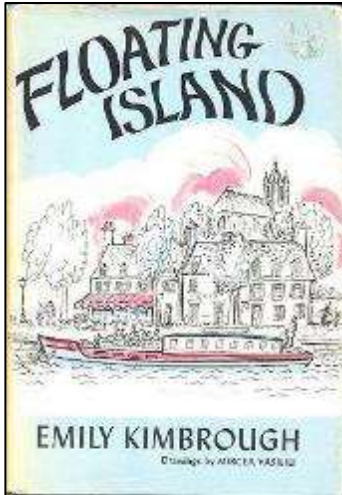
Another entry offers some hope regarding anchoring.

In an effort to keep Blacktip Island in place should it break free from its foundation, the Tiperon Islands Public Safety Department has installed chains to hold the Caribbean island to the seabed.

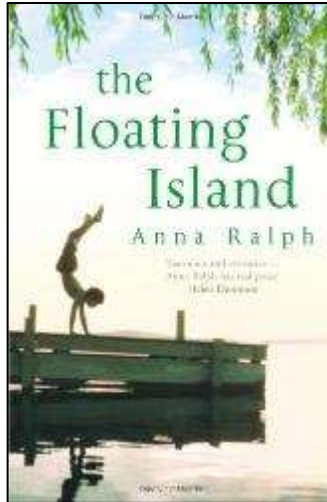
"Given the advanced stage of erosion under the island, we were concerned Blacktip might come loose and float away," public safety spokesperson Rocky Shore said. "The last thing we want to be is a navigational hazard."

"The bigger worry was if Blacktip drifted into someone else's territorial waters," added acting-mayor Jack Cobia. "I mean, a good south wind and we'd be part of Cuba in a day, day-and-a-half, tops. And I don't speak a lick of Spanish."

As for how the anchoring might be accomplished, see Chapter 73.



Floating island (1968) by Emily Kimbrough. The author and friends travel down the Seine on a converted barge



The Floating Island (2011) by Anna Ralph, the title inspired by Derwentwater (Chapter 48) as metaphor for the loss and re-emergence of memory.

CHAPTER 11

PURSUE ADVENTURE

In this chapter, we'll peruse the bookshelves for works perhaps not noted for their lasting contribution to modern literature, but good adventure tales involving islands that float. We'll begin with "Agnes: The Beautiful Shepherdess. A Tale of the Lowlands of Scotland," Roman Citizen, December 31, 1847, by St. Clair.

The moon gradually rose from the dense and heavy clouds, and its silver light discovered to our view several small islands, which, like huge monsters at rest, appeared to repose in the quiet waters. Among this group of islands is one generally known as the "floating island;" which is supposed by many to be influenced by the oscillations of the waves; but whether this phenomena is true or false, we leave our readers to judge.

The sun was fast sinking behind a pile of azure clouds in the western horizon when two canoes touched the "floating island." Edward met the beautiful shepherdess beneath a noble oak, their place of meeting.

In Abby Alger's "In the Pond and On the Marsh," St. Nicholas: An Illustrated Magazine, November, 1875, a little girl visits a marsh near her house and sees a floating island with a small birch tree holding a heron nest; She is told that if one stands on the island and holds the heron's egg for a moment, if the heron then hatches the egg, one's wish will come true. When she tries to do this she drops the egg.

She was even more astonished than before, for now she caught sight of the little green island, but far from the place where she first saw it, it was sailing slowly across the marsh in the southerly breeze, and the little white birch was the sail. As soon as Beata reached home she told Anne, the nurse, what she had seen. Anne knew the floating island well, it had been in the marsh for many a year. Every year a loon built her nest there, and Anne had her own opinion, both about the loon and the island, but when Beata teased to know more, old Anne only shook her head, for she was not one to tell all that she knew. At last she yielded, and said that if any one stands on the floating island, and takes the loon's egg from the nest for a moment, and wishes something, it will surely come to pass, if the loon does not forsake her nest, but hatches the egg in peace.

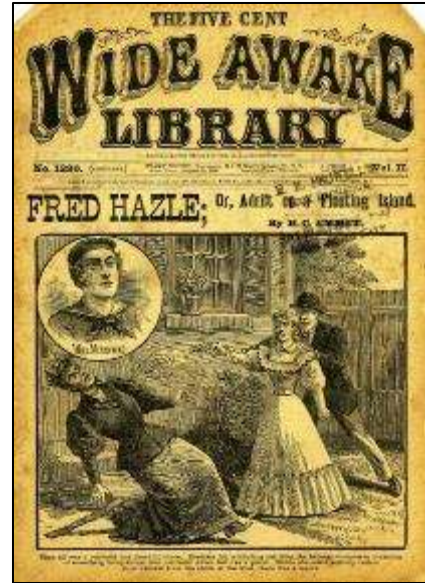
"Fred Hazle; or, Adrift on a Floating Island," Five Cent Wide Awake Library 1:229 (1880) by H.C. Emmet. A few passages:

"We're on a sunken reef. How in thunder did it get here? There should be a depth that no cable could reach.

At times the vessel rocked as if lifted by a rising tide, but sinking again without any sound of grating on reef or land, and still for all that she remained a fixture.

The word soon passed, they were wedged upon something that held them like a giant vise, and still drifting.

"Look, look," cried Fred, pointing to the great irregular column that was rising out of the water still higher, and as the two other shiny and blackened oblong and jagged protuberances became visible amidst fresh bursts of sulphurous flame -- a dull and vibrating rumbling and hissing.



**This is no wild flight of imagination. As late as the end of 1877, a captain of a Danish soiling vessel met a similar volcanic "island" in Terra del Fuego in lat. 65 S., long. 75 W. No island was marked on his map, so he left the ship and visited this strange rock in a small boat. Its shape was almost conical, and very precipitous; and when one of the sailors attempted to land he leaped back as flames came from under his feet, and the sea around began to bubble and hiss. The island disappeared in a few hours. Another proof that truth is stranger than fiction.*

Escaping that type or island, they encounter another.

The more they explored the island, the worse their prospects were. Cassidy became gravely troubled.

"Jack," he said, "this island is a mere excrescence of seaweed, fallen timber, and earth carried by the cyclones over the main land to which this was attached. Do you notice any change at all?"

"Yes, Jack, but keep this terrible information to your own stout heart. The floating island is slowly crumbling to pieces!"

Another escape, and at long last, the final line.

That day Fredrica had become his wife, it sailor's bride, and with no fear of the sea, in spite of the dreadful sufferings and horrors passed through when "ADRIFT ON A FLOATING ISLAND."

"The Adventures of Harry Marline," The United Service, March 1884,

When we got within a mile of the island it appeared to be covered with the most luxuriant foliage down to the water's edge, and seemed to be entirely free from rocks or shoals. We all congratulated ourselves on this adventure, and flattered ourselves that we should be to take some good repose under the shade of those beautiful trees, perhaps be able to regale ourselves with some of the delicious fruit the tropics, though the island was not likely to contain a great variety.

What was our surprise, as we approached, to see the thing rocking and rolling about like a ship in a sea-way, and when within twenty yards of it a voice from the topmost branches of the trees shouted to us, "Git out of the way with yer boat, or I reckon you'll be run into."

Chapter 11 -- Pursue Adventure

We had hardly time to obey these commands before the thing took for an island came tearing past us, and we heard the same voice in the branches singing out, "Boat ho! on the starboard."

"Luff to," shouted a loud voice among the trees, and the island appeared as obedient as a ship to her helm, rounded to handsomely, and lay as quiet on the water as a ship with main-topsail to the mast.

"Boat ahoy!" shouted the stentorian voice from the trees. "Whar are you from, and whar are you a-goin?"

"This must be magic," said the lady, much alarmed. "Let us fly, good Atherton, before it is too late, and we get entangled in new toils.

"It is rather a strange affair, madam, indeed," he replied, "but there may be protection here, and if it is magic, there is no chance of escaping from it. I think we had better pull closer and reconnoiter."

She clasped her child close to her bosom, as if to protect it, and said, "God's will be done. I am in his hands, do as you think best, my kind preserver."

"With that we pulled up to the floating island, and as we got close to it, a man came out on one of the branches which overhung the water, and exclaimed,

"Wal now, I never! Why, if thar ain't a boat adrift with a 'oman and a child inter it! Wal, did I ever! Who are you, anyhow?" said the man to us, "and what are doin' of, adrift in that 'ere boat?"

"We are distressed mariners," Atherton replied; "and in the name of heaven, who and what are you?"

"Wal, now you nought well ax that question, for I reckon the owners wouldn't know the good ship Ichabod just now. We are a guano-ship, my good fellow," he continued, "and bound to Bostin, and them 'ere leaves you're a-lookin' at now is nothin' but the timbers a sproutin', that's all. Pull alongside, my hearties, and we'll give you a welcome and the best mess of codfish you set down to for many a day."

Strange as this explanation appeared to us, we hesitated no longer, but pulled alongside, having to haul the boat under the branches of the trees to reach the gangway. Many anxious and curious faces were standing around, and, as we handed our charges up, ten thousand questions were asked in a minute; but there was no want of sympathy for the distressed voyagers, and everyone seemed to lend a helping hand to get us on board.

"St. Brandan's Isle," [Buffalo Evening News](#), March 23, 1893, a nautical story, the underlying legend pursued in Chapter 3.

In 1883, I was interested in what promised to be a very big thing on the Pacific coast. It involved the purchase of fast steamers, and it looked to the carrying of certain cargoes to be bought in China.

Voyage home -- latitude, 42 degrees, 50 minutes; longitude, 147 degrees, 30 minutes west we sighted land. Now, sir, if you will tell me what island group is located up there in the lonely north Pacific in the track of a man who might be steering quietly for Vancouver, I'll name you as one of the trustees of my will or one of the lawyers to defend it, whichever you choose. Why, you might have bought my sailing master, Roger Appleby, and he was a gritty man, for 3 ha'pence, he thought, he was out of his reckoning, and that we had struck the Farallons.

Never a village could be seen, huts or fishing boxes, nor a signal station of any kind: tropical vegetation, too, and balmy air and a sort of soft luxuriance to the colors of the trees and flowers that made you hanker to get on shore and stretch in a hammock.

Not a living soul did we meet, nor did we see a human habitation in all this wilderness of superb, magnificent, idyllic vegetation until we struck a little hill, from whose rise we began to

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see the great tranquil ocean, all milky blue in the sun, and there all of a sudden we came face to face with an old monk in a long brown robe and with a beard that swept the ground, who smiled at us and lifted his hand to give us his blessing.

"Do you know what this place is?" said Appleby, kind of choking. "It's St. Brandan's isle."

You have heard of St. Brandan's isle, I suppose? I never had, and only know now what of its history Appleby could tell in his way; but I've seen it, and I know it exists, and I never argue with a sailor now when he tells one of the strange things that the ocean keeps a secret from landsmen.

"We must get away," says Appleby. The man was moved to his core, I tell you.

"And why?" I asked him.

"For one thing," said he, "we are not good enough to set foot on such a land, and, for another thing, the men."

"And what will they do?" said I.

"If they find out what place this is," said Appleby, "do you suppose they will ever leave it?"

"Pooh!" said I. "I'll tell them myself, and you shall see whether they listen to what I have to say. Why, man alive, is it possible that you don't understand what this means to us? Didn't you say this was a floating island?"

"I did," said he, "and up here it has floated out of our knowledge, for it was supposed to lie off the Canaries, and it's been looked for in the South Atlantic all these years."

"Here we find it then," said I, "and we'll tow it to the California coast and anchor it off the Golden Gate. A fortune? Why, good heavens, this is a hundred fortunes for you and me, and all of us."

Merciful powers, think of it! A clear title, by discovery, to St. Brandan's isle! The whole island, just of a size to tow to land, moored off the coast of the greatest nation in the world, and all this miracle exhibited for the benefit of its 80,000,000 of people. Why, the imagination is utterly powerless to conceive of a better way to benefit humanity! I saw that place, sir, made in the turn of a hand into the most wonderful retort that the world would ever know -- parks laid out by the simple process of running fences; the necessary roads and paths judiciously cut; electric light introduced; a portion, not too large, of the sea beach reserved for building lots; a cathedral built for St. Brandan and his monks, and as for a natural sanitarium, a panacea for all diseases, an atmosphere and a soil that would prolong life beyond the psalmist's span. Here were actually, veritably, incontestably, all these things. I grow dizzy now when I think of what might have been.

I suppose I need hardly say that when I explained all this to Appleby, he rounded on me. Besides being a sailor and superstitious, he was an Englishman and perverse, and at first he vowed and swore that nothing under heaven should persuade him to lend a hand to such a scheme. Even when I pointed out to him that by his own showing the trees grew food fit for Utopia, and that there were mines of precious metals and stores of precious stones sufficient to enrich all mankind in the island, he could not see it, but I was owner, and he was under my orders, and I can tell you I wasn't likely to allow by sentimental objections to stand in my way.

Appleby represented that we were too deep laden to take tow of any kind, and I copped him by ordering the whole cargo carried ashore in the boats and piled on the beach. And that we did, sir. It came easy out of the hold; it was all in small boxes, and we started in to tow that island with hawsers, and she moved.

For one week we had St. Brandan's isle in tow, and in that time made 84 knots toward San Francisco. And I raised the American Flag on the island with appropriate ceremonies. And I had an interview with the old monk and tried to tease him down as a matter of precaution, but as he

could understand nothing but Latin, and as nobody on board ship spoke a word of that language, we did not come to what you might call an arrangement.

Regarding raising the flag, see Chapter 53.

Well, sir, everything seemed stretched on a dead taut line when, one morning about 6 bells, down came the old monk to the beach. I was prepared for this and gave the signal to slow up at once, and the hawser dropped under water. I've been on canals in my time. The old man must have inspected something, however, for he stood and looked at us for a while and then turned and walked away. Appleby gave me a heavy glance. I could see the thing preyed on his mind

And that night, whether it was monk, miracle or the ordinary course of nature, the wind began to blow the hangman's jig from the cast. And that, I hadn't reckoned on. For should St Brandon's isle have favoring breezes or should it not?

We stood it as long as we could. By midnight it was slip cable or be driven ashore.

And will you go ashore with me?' says Appleby between his teeth.

"What?" says I. "Spend the rest of my life there cursing the luck because I could not bring such a prize to the United States? Never! But no need of that, you fool, for we'll steam round to the west and lie to under the shore till the wind shifts."

"You'll never set foot on St. Brandon's Isle again, then," said Appleby.

And so it turned out, for just as we steamed west after we had rounded the cove, the isle fled faster into the darkness, and when morning broke we were alone on the sea in the grip of an easterly storm and barely a ton of coal left in our bunkers. What was more, the opium was lost - - stacked on the beach of St. Brandon's isle, where opiates were about as useful as blue laws.

"The Floating Island," Chapter 22 of "\$5,000,000 in Gold, or The Treasures of the Sargasso Sea," was a serialized novel by Scott Campbell. From the Boston Daily Globe of June 4, 1894,

Nearly a mile ahead of the Valiant rose the strange elevation which a week before had been taken for land. It looked like land now. To fully 20 feet above the apparent sea level it rose in a gentile incline, stretching away toward the north and the south in a circular form, and presenting the appearance of a slightly rounded island of remarkable regularity and smoothness.

The surface presented a verdure like that of thick trailing plants or vines. Yet not a rock or tree, so much as a bush, was anywhere visible.

By the aid of the glass, it could be seen that here and there, small patches of colored flowers were blooming close to the ground -- if ground it was. But the whole extent of rising territory was as devoid of other kinds of life as the most barren rock in all the boundless ocean.

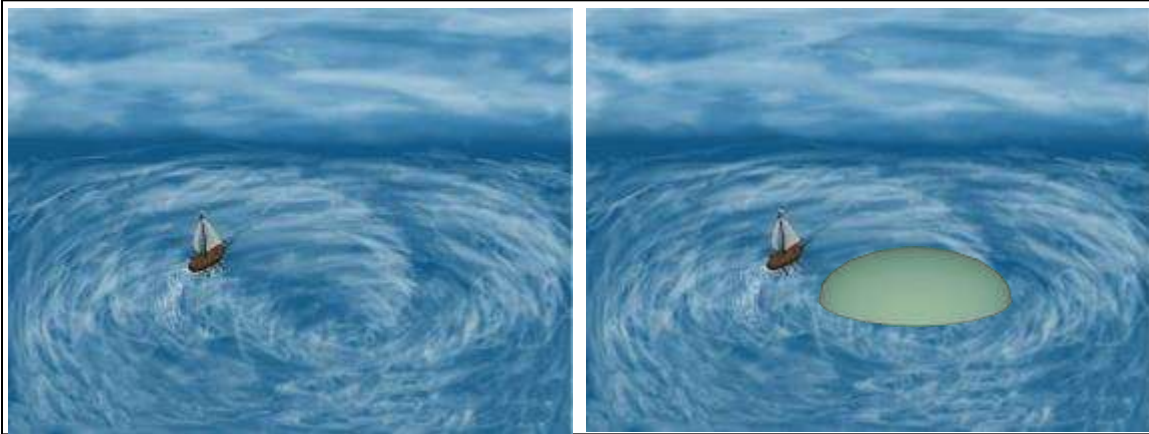
A bit later, a pseudo-scientific explanation.

It was the concentric force of the circulating water which urged the drift onward and inward, closer and closer, more and more compact in proportion with the force exerted, and by the enormous pressure around and beneath it, fairly lifted above the surface of the medium in which it floats.

Behold the drift and debris gathered through centuries... and driven onward and inward in this common center! It has indeed been forced above the common level of the sea! Yonder island is indeed an island without a shore, an island without a foundation!

It floats! It floats in the mid-Atlantic and turns ceaselessly around and around with the movement of the sea! It is a floating island!

The raison d'etre is hydraulically bogus, however. Rotational velocity is greatest near the axis and the fluid surface depresses, per Bernoulli's principal, Chapter 20.



How nature works

How nature doesn't work

In "The Passing of Penglima Prang Semaun," Malay Sketches (1895) by Frank Swettenham, adventure without silly physics, the eponymous villain escapes his pursuers riding a floating island out to sea.

It cannot be said that anything very unusual happened, because the thing is of common occurrence, but it was certainly thoughtfully arranged that at that moment there should sail round the bend of the river, in the strongest flow of the ebb-tide (now of course slackening), an enormous mass of floating palms, a very island of foliage broken away from some undermined bank and drifting majestically to the wider waters of the sea.

If these great clumps of root and branch and foliage may be seen sailing every day down a Malay river into the Straits of Malacca, this particular island was so gigantic, that in size at least it was miraculous.

The island sailed slowly along, and when the huge mass got near enough to the guard-boats for them to realize their danger, there was a deal of shouting and pulling of anchors, kicking up sleepy boatmen and frantic struggles to avoid this river Juggernaut.

One can almost hear him chuckle as he sails through that last danger and watches his enemies' efforts to get back into their places.

In The Romance of a Midshipman (1898) by W. Clark Russell, the hero is shipwrecked off the coast of Brazil. The paragraphs that follow are not contiguous.

I was amazed; there leapt into the lenses a little sallow island, with a number of trees upon it, most of them ruined as though by a hurricane, and in the midst of the trees was something I could not obtain a clear sight of. It was solid, and made a thickness there, and I thought it was a house. I pulled out the chart to make sure, for the flash of the sun was now upon the sea. But nothing was set down as indicating land, or a rock or a shoal.

A floating island! Did you ever hear of such a thing? Do you suppose that I am inventing this merely as an incident in a romance of adventure by sea? Where is the old sailor who has not in his time, in one voyage or another, sighted the floating island, the fragment of earth remorselessly wrenched by the irresistible power of the cyclone or the tornado from the mother continent, and sent to add another whilst it lasts to the countless wonders of the deep?

How am I to describe this floating island in words? It would need the colors, and some of them ghastly, of the great painters to reveal it to you, charged with its incommunicable spirit of loneliness, ghostlike, almost appalling, and as a miracle, which to my sight it was. I saw a

considerable tract of land afloat! The edges of it came close down to the sea; there was a great quantity of fallen timber half out and half in, and the mystery of the sight lay in its motion, for that it had, now we were close enough to perceive it,.. a very faint lift and fall, passing through it like some large secret swell from west to east. It was like the memory of the earthquake and a yearning in the soil to attach itself to its mother coast again.

From what part of the world had yonder island come? From the Brazilian coast no doubt. As we drew near I judged it to be of the size of the reef we had left but of a different shape. What had seemed sallow at a distance changed into a livid and into a scorched look to the gradual approach of the boat.

The soil seemed filled with tangled roots, and the island resembled a huge basket, whose fabric was visible in the soil, and through the storm-trampled grass.

What was to be our fate on a floating island that in any hour might loosen and go to pieces?

From a review of the work in "London Literary Letter," New York Times, November 5, 1898,

In his new book, the author has, however, succeeded in inventing a new incident. His hero and heroine land on a floating Island which immediately proceeds to get up its anchor and to start on a cruise. The floating island is something quite new in sea stories and will be warmly welcomed by Mr. Russell's countless admirers.

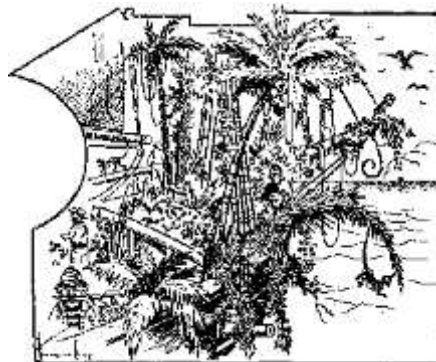
But "something quite new in sea stories?" Here we beg to differ. As we've noted, such stories go back as long as we've had stories.

A Year in a Yawl (1901), by Russell Doubleday

For a minute Kenneth paused for breath, then he noticed that "His Nibs" was being battered and ground by the constant action of the ice. He peered into the darkness to see how large his floating island was, and stepped cautiously this way and that to test its stability. It swayed frightfully, but the boy determined to risk adding the extra weight of the small boat. Inch by inch he drew it over the slippery surface,

"The Ship That Sprouted," Brooklyn Daily Eagle, February 7, 1904

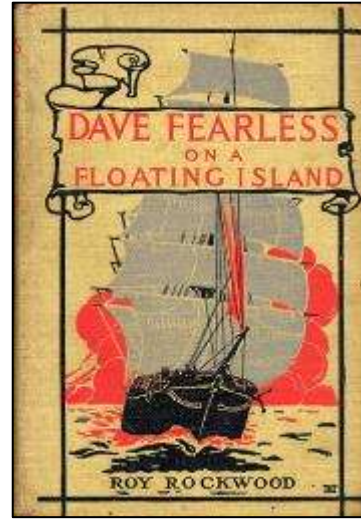
That night the Good Samaritan set sail, but the very next morning, when Hank came on deck to order all hands piped up for prayers, he found that the masts and spars and new bulwarks and decks and even the latching on the hull had sprouted and thrown out branches in every direction. He ordered the crew up in the rigging to cut away the branches, but it was no use. Having once got a start, those masts began to suck up the richness of that marvelous soil down in the hold, and throw out foliage, faster than it could be chopped away. Ham realized then what the natives had meant by their jabbering, but it was too late to apologize.



By the next day the whole ship was a tangled mass of green leaves, with parrots and monkeys chattering among the branches. Nobody could explain how the parrots and monkeys had grown out of that wonderful soil, but still there they were, and that was all there was to it. The Good Samaritan, In fact, was turned into nothing but a floating, island.

For fast-paced action, we turn to Roy Rockwood's The Cruise of the Treasure Ship; or, The Castaways of Floating Island (1906) reissued as Dave Fearless on a Floating Island, or, The Cruise of the Treasure Ship (1906).

Treasure hunting takes Dave and gang to the marshy, flat end of a Pacific island. When a storm tears their part of the island away, they're on a floating island of several acres with. They, plus parrots and monkeys, spend the night and in the morning it drifts back to the island from which it was detached;



Alexander MacDonald's In the Land of Pearl and Gold: A Pioneer's Wanderings in the Backblocks and Pearing Grounds of Australia and New Guinea (1907) proclaimed itself be an "accurate" book of travels, but the prose speaks otherwise. The author and his companions encounter a floating island in a river west of the western branch of the "Fly River" in New Guinea

"I see something straight ahead," spoke Mac, waving his hand mysteriously as a signal to me to keep off to the right, which I accordingly did; then Emu Bill, who had been straining his eyes forward, exclaimed:

"Hang me if it isn't an island, mates, right in the middle of the channel!"

I motioned the "boys" to pull easy, but almost before we could realize it we were crashing through a fringing belt of half-submerged reeds.

Slowly we backed out from the muddy bank, and when well clear of all entangling vegetation Mac dropped the anchor; then we busied ourselves preparing supper and arranging our blankets for a night's sojourn on the waters.

"I have a curiosity to know what sort of island we have struck, boys," I said, when our frugal meal was over. "There doesn't seem to be any trees on it, and we might easily have a tramp round before turning in."

The moon was just beginning to show above the timber on the right, casting a pale reflection on the eddying current, and illuminating ever so faintly the low-lying island stretching before us.

"I don't mind going exploring with you," yawned Emu Bill. "Mac and Phil here can wait an' see that nothing goes wrong with our man-o'-war."

"Mind the crocodiles!" roared the first-named gentleman, as Bill made a reckless leap into the water, splashing noisily. I followed less impetuously, marveling much at the sluggishness of the oily stream at this point. There seemed to be absolutely no flow.

We reached firm ground with considerable difficulty, having first to traverse a patch of very boggy soil, into which our feet sank alarmingly at each step.

We'll skip the arrow attack and pick up where they discuss the geology.

And here we were, in the middle of a stream, which we had calculated to have a flow of over four miles an hour, yet standing stock-still.

Chapter 11 -- Pursue Adventure

"I know what's the matter, boys," Phil said quietly. "The entire island is floating."

He was right. Incredible as it may seem, reeds, scrub, and everything else were floating downwards with the current.

"Sue Visits Sun-Set Land. Her Trip with the Fairy Doll, Miriam, to the Vast Unknown -- The Floating Island," Brooklyn Standard Union, May 29, 1910, by Doris Webb

"Why, you can talk!" gasped Sue, and as she looked at Miriam she saw that she no longer looked like a doll, but like a real person -- a regular fairy.

"I'm going now," said Miriam, "and of you don't let go of my hand you'll have to come along too"

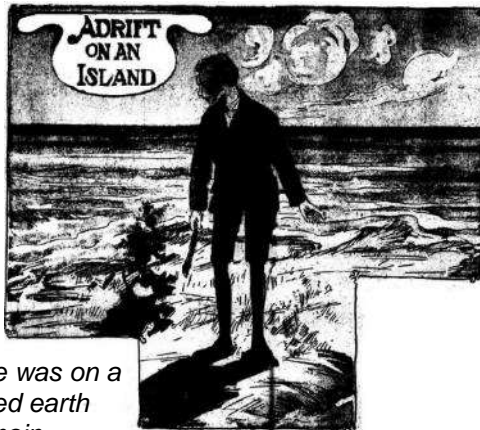
But still Sue kept hold of her hand, and the next moment found herself floating in the air beside Miriam, who had spread a beautiful pair of wings.

"You needn't be frightened," said the doll-fairy. "I think I'll show you the sunset country as long as you're such a brave little girl.

They sped away toward the great gold purple island with golden waves lapping at her feet. The island kept floating along, and growing smaller, so that Sue was forced to jump to a larger one. The sea was red now and the land gray. Miriam was flitting here and there, playing with the water and sending the islands floating with her wand.

The "island" in James Elverson's "Adrift on an Island," Philadelphia Inquirer, November, 27 1910, is in the Bahamas.

Arthur rubbed his eyes to make sure he was not dreaming. The channel certainly was growing wider. He had reached the verge by this time and looked with wide, amazed eyes upon the opposite shores, whose coral formation showed plainly in the jagged reefs that gleamed above the sunset waters, while the shore beneath, his feet was low and flat, without sign of rock or shell.



The truth flashed upon him with bewildering force. There was on a floating island, one of the many masses of accumulated earth and vegetation drifted together by the tides, which remain stationary until they attain a certain size, then float out to sea, breaking as they go

"The Loot of Bombasharna," Book of Wonder (1912), Edward Plunkett, Lord Dunsany, is set in the Sargasso Sea.

There was a little archipelago that he knew of on the wrong side of the Sargasso Sea; there were about thirty islands there, bare, ordinary islands, but one of them floated. He had noticed it years ago, and had gone ashore and never told a soul, but had quietly anchored it with the anchor of his ship to the bottom of the sea, which just there was profoundly deep, and had made the thing the secret of his life, determining to marry and settle down there if it ever became impossible to earn his livelihood in the usual way at sea. When first he saw it, it was drifting slowly, with the wind in the tops of the trees; but if the cable had not rusted away, it should be still where he left it, and they would make a rudder and hollow out cabins below, and at night they would hoist sails to the trunks of the trees and sail wherever they liked.

But it swerved away again and was lost in the mist.

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When dawn came there was the island, no bigger than two ships, straining hard at its anchor, with the wind in the tops of the trees.

When they needed new provisions they hoisted sails on the trees, and as long as no ship came in sight they SCUDDER BEFORE THE WIND, with the water rippling over the beach of the island; but as soon as they sighted a ship the sails came down, and they became an ordinary uncharted rock.

They mostly moved by night; sometimes they hovered off sea-coast towns as of old, sometimes they boldly entered river-mouths, and even attached themselves for a while to the mainland, whence they would plunder the neighborhood and escape again to sea. And if a ship was wrecked on their island of a night they said it was all to the good.

"Loot of Bombasharna," Sidney Sime



And yet today, the story is told.

And no one is known to have found them out or to have annexed their island; but a rumor arose and passed from port to port and every place where sailors meet together, and even survives to this day, of a dangerous uncharted rock anywhere between Plymouth and the Horn, which would suddenly rise in the safest track of ships, and upon which vessels were supposed to have been wrecked, leaving, strangely enough, no evidence of their doom.

"The Floating Island," The Birch and the Star and Other Stories (1915) by Gudrun Thorne-Thomsen is sentimentally Edwardian in nature. We'd like to include it in its entirety, but space limits us to just the lines referring to the island.

Beate could not get tired of looking at the pretty little island. It was so pretty and so little, not bigger than one-quarter of the parlor floor, and oblong, with here and there tiny bays and points. Willow bushes grew out of the grass in some places and in one end grew a little white-barked birch tree. Beate thought she had never seen anything half so lovely as the little green island on the black water. It seemed just like a strange little land, all by itself. She kept watching it through the bushes hoping all the time the bird would come again, but it stayed on the island. At last the evening breeze began to ruffle the surface of the water a little and Beate remembered that she must hurry home.

Again she looked up and peeped through the leaves and branches to say good-night to the island, when—think of it! The little green island was gone.



And she became more astonished than ever for now she saw the little green island again but far from the place where she first saw it. It was sailing slowly towards the southern end of the lake and the silver birch was its sail.

As soon as Beate reached home she found Anne, the nurse, and told her what she had seen.

Anne knew all about the floating island, it had been on the lake for many years, she said. But there were many strange things about it. Every time there was to be a fine year for the farmers

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the island was green all summer, but if there was to be a bad year the grass on it grew yellow and brown and there were but few leaves on the little birch. Yes, old Anne would not be surprised if there appeared blood red spots on the island in years of warfare and trouble. Every year there was a loon's nest there, But one thing she would tell and that was, that if anyone stood on the floating island and took a loon's egg out of the nest and wished for something, that wish would come true, if the egg was put safely back into the nest again.

Beate could think of nothing but the island all that evening, and when she had closed her eyes she could dream of nothing else all night. Now it was covered with blood-red spots -- now it was green; then she thought that the loon cried "I am the Princess of England, but I have been bewitched and must stay a loon. "Just as soon as Beate got up in the morning she begged her father to row her and Marie and Louise out to the floating island, when they came to visit her in the afternoon, and that he promised.

In the afternoon the father took the three little girls down to the lake. Beate's friends thought this was the loveliest thing they had ever seen, and they begged the father to stop and get some of the pretty water-lilies for them. But Beate alone was longing for the floating island. It lay in the middle of the lake, and when they drew near, it looked as if there were two little islands, one on top of the water and one below its surface, and the latter was almost prettier than the former. The father rowed close up to the island and around it, and when he came to the other side the loon plunged out of the reeds into the water and was gone.

The loon's nest lay on the very edge of the little tiny island hidden among the grasses, and in the nest lay two big grayish-brown eggs, with black spots, larger than any goose eggs.

Beate felt strangely frightened and was very quiet. She begged her father to let her stand on the island, only a minute, and would he let her take one of the eggs in her hand?

The father would not deny her that, but lifted her up onto the floating island. And now Beate stood on the green floating island. Her father, Marie, and Louise stood by without saying a word. At last the father stroked Beate's hair, kissed his little girl, and lifted her on to the raft again.

Dunsany's "A Story of Land and Sea," Tales of Wonder (1916), furthers the saga.

It is written in the first Book of Wonder how Captain Shard of the bad ship Desperate Lark, having looted the sea-coast city Bombasharna, retired from active life; and resigning piracy to younger men, with the good will of the North and South Atlantic, settled down with a captured queen on his floating island.

Sometimes he sank a ship for the sake of old times but he no longer hovered along the trade-routes; and timid merchants watched for other men.

But even the best of roguery has its end, and in Captain Shard's case, his floating island becomes his refuge for retirement.

True he might yet have practiced piracy in spite of the step that he took, a little later when the seas grew quiet, but that penultimate step was like that small house in the country that the business man has his eye on, like some snug investment put away for old age, there are certain final courses in men's lives which after taking they never go back to business.

The Voyages of Doctor Dolittle (1922) the second of Hugh Lofting's Doctor Dolittle series.

"We are going to Spidermonkey Island, Miranda," said the Doctor. "You know where it is, do you not?"

"I know where it was the last time I saw it," said the bird. "But whether it will be there still, I can't say.. Spidermonkey Island is a floating island. It moves around all over the place--usually somewhere near southern South America. But of course I could surely find it for you if you want to go there."

A bit later,

The porpoises gave us one last push and our strange-looking craft bumped gently on a low beach. Then, thanking our lucky stars for a chance to stretch our cramped legs, we all bundled off on to the land -- the first land, even though it was floating land that we had trodden for six weeks. What a thrill I felt as I realized that Spidermonkey Island, the little spot in the atlas which my pencil had touched, lay at last beneath my feet!

As we were looking out to sea, we noticed our friends the porpoises jumping through the waves. The Doctor hailed them and they came inshore.

He asked them how far we were from the South Polar Continent.



About a hundred miles, they told him. And then they asked why he wanted to know.

"Because this floating island we are on," said he, "is drifting southward all the time in a current. It's an island that ordinarily belongs somewhere in the tropic zone -- real sultry weather, sunstrokes and all that. If it doesn't stop going southward pretty soon everything on it is going to perish."

"Well," said the porpoises, "then the thing to do is to get it back into a warmer climate, isn't it?"

"Yes, but how?" said the Doctor. "We can't row it back."

"No," said they, "but whales could push it- -- if you only got enough of them."

"Thank you," said the Doctor. "You are very kind -- By the way, do you happen to know how this island came to be a floating island? At least half of it, I notice, is made of stone. It is very odd that it floats at all, isn't it?"

"It is unusual," they said. "But the explanation is quite simple. It used to be a mountainous part of South America -- an overhanging part -- sort of an awkward corner, you might say.

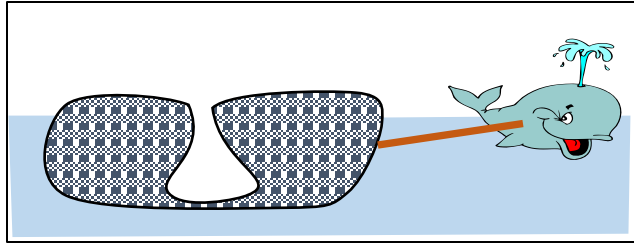
Way back in the glacial days, thousands of years ago, it broke off from the mainland; and by some curious accident the inside of it, which is hollow, got filled with air as it fell into the ocean. You can only see less than half of the island: the bigger half is under water. And in the middle of it, underneath, is a huge rock air-chamber, running right up inside the mountains. And that's what keeps it floating."

And when we were come to the lip of the volcano (it took us half a day to get up to it) we found the stone was unbelievably large--big as a cathedral. Underneath it we could look right down into a black hole which seemed to have no bottom. The Doctor explained to us that volcanoes sometimes spurted up fire from these holes in their tops; but that those on floating islands were always cold and dead.

"Stubbins," he said, looking up at the great stone towering above us, "do you know what would most likely happen if that boulder should fall in?"

"No," said I, "what?"

"Well, this stone is heavy enough, if it fell into the volcano, to break through into that air-chamber from above. And once it did, the air would escape and the floating island would float no more. It would sink."



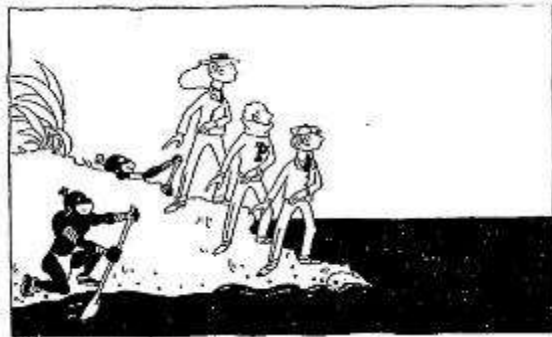
Escape a Shipwreck and Travel on a Floating Island with Cannibals who Perform Shakespeare!

1969 film adaptation

Then we have "The Rover and Over Boys: Volume III: How Tom Pranked a Lot of Cannibals," Life, May 28, 1925, by Corey Ford

"Look! Dan Baxter has kidnapped the three girls," interrupted Dick, pointing to the bully who was rowing a small boat rapidly across the ocean.

"Let me up and I help you catch him," offered the King seriously.



"Have you got a boat?" asked Duck.

"Me no need boat," replied the King. "Thus is a floating island." And while the Rover Boys stared in astonishment, the natives each seized a paddle and rushed to several convenient promontories along the shore.

"Oomp," commanded Zuloaga, as the natives dipped their paddles into the water and the island started in hot pursuit.

For floating-island propulsions alternatives superior to paddling, see Chapter 12.

"Marigold," Buffalo Courier, April 6, 1926, a serial by Eustace Ball,

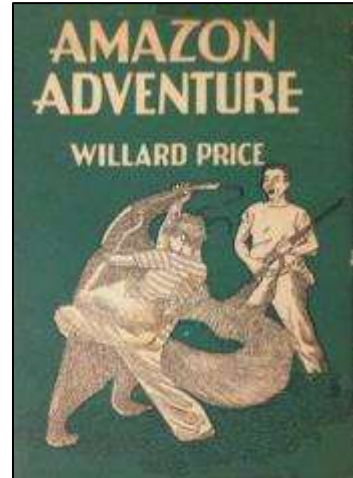
Reginald Arnold was standing at the door of her cabin with a heart-gladdening big bouquet of fresh violets.

"Where on earth did you get those?" she demanded, glad to escape her thoughts. "Pick them from some floating island in the gulf stream? Or did they slide down from some mountain top, hundreds of miles away, on one of those slanting golden sun beams?"

"The Floating Island," The Amazing Amazon (1949), by Willard Price, tells of an Amazon expedition to capture zoo animals.

His roving eye lit upon a floating island passing the mouth of the bay. A wild thought came to him. He did not stop to analyze it - there was no time to weigh chances. He lifted Roger and made his way out to the end of the point.

The river was browner, more turbid, and more rapid than usual. The main current boiled past close to the point. Something colossal must be going on in the headwaters on the banks of the Andes. The swollen river was dotted with moving islands. They were of different kinds, although all due to the same cause -- flood.



One that passed very close was a kind that he did not care to trust a bed of water hyacinths torn loose from some marsh. Only the leaves and flowers showed above the surface. Below, the bulbs must be tangled together in a tightly-knit mass. But the whole mat was not more than a foot thick and might not support two husky boys. Even if it did, one of those great floating trees with branches milling around like paddlewheels, and roots projecting like the tentacles of an octopus, might roll over the islet, destroying it and everyone who happened to be on it. Many boats, even large steamers, had been stove in by those crazily thrashing trees.

Then there were islands made up of brush. In some rapids a bush had caught on a rock. Other bushes, slides and logs had joined it, and the whole had been matted firmly in one solid mass and had finally broken loose to sail downstream as an island an island without soil.

But more amazing were the islands that had soil, plants, even trees everything an island should have except the ability to stay in one place. A strong current had undercut a piece of land and carried it off entire. Some of these islands were two hundred feet across. He had heard that they were at times twenty feet thick.

Something that looked like a large pasture came floating down and when it grazed the point Hal stepped aboard with his burden. He was thankful that he did not immediately sink through into the river. In a moment the point was left behind and the two boys were embarked upon as strange a voyage as anyone had ever made.

Adventure fiction is prone toward geologic fiction, but here a real environment is well portrayed. Real nature can more adventurous than that of a made-up world.

He surveyed his floating kingdom. He laid Roger down in the grass and walked about, frequently testing the ground to be sure that it was strong enough to hold him. His island was a good half acre in size. Much of it was in grass but there were also many small trees, especially cecropias, rubber trees and bamboos. The fast-growing bamboo was tall but all the other trees were not more than a few feet high.

His island was quite evidently only a year old. The flood of a year ago had deposited a half acre of silt somewhere and when the water subsided, there was a new island. Seeds sprouted and trees attained a year's growth. And now comes this year's flood to undercut the island, lift it from its Gm base and carry it off bodily down river.

The only trouble with his theory was the fact that on the downstream side of the island lay an enormous tree that must have taken a hundred years to grow. He walked over to examine it. It was a great silk cotton, or kapok tree. Its trunk lay in the water and its huge branches rose some fifty feet into the air. At the base of the trunk was a tangle of big roots.

No, his theory still held water. This tree was not a part of the island. The two had merely become jammed together while floating down river.

There was something a little terrifying about barging through the darkness at the mercy of a strong current. What if his hurrying half acre should crash into a point, or a fixed island? He tried to tell himself that it was not very likely. His craft was carried by the current, and the current goes around things, not into them.

"Shadowland Adventure," Long Island City Star Journal, February 26, 1942, by Max Thell,

So up the beanstalk they climbed until finally they stepped from the last leaf onto a floating island. You mustn't forget that they were inside the Fairy Tale Book. There are all aorta of strange things in Fairy Tale Books which you will find nowhere else no matter how hard you look.

In the middle of the floating Island was an immense palace.

"That's where Mr. Big, the giant lives," Jack explained. "Let's go and see what he's doing."

At they came near the palace they heard a great noise. They could hear Mr. Big roaring: "A bigger piece! I want a bigger piece!"

"The Breton Sisters," Philadelphia Inquirer, November 19, 1944, by George Simonon

On his left lay the open sea, a glimmering expanse of greenish-gray, while on his right some rowboats were splashing across the harbor towards the fishing-smacks, which, made fast side by side, looked like an island topped by a grove of masts.

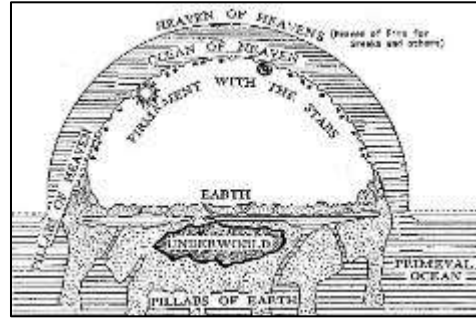
Almost daily he met his friends on that floating island, lounging on their decks or scrambling over bulwarks. Throughout the off-season they forgathered there, more from force of habit than because there was anything much to be done on board. One went to one's ship, unlocked the padlocks on the doors, and did such odd jobs as splicing ropes, tinkering with a pulley, putting an edge on chisels, white exchanging remarks from deck to deck.

The Face of the Waters (1991) by Robert Silverberg is set on the distant planet Hydros, a vast sphere covered by water, its surface broken only by the occasional appearance of artificial islands populated by the descendants of prisoners stranded on Hydros centuries before. When an inhabitants commits an unforgivable transgression, he and his community are forced to leave their island forever. In a flotilla of ships -- many of which will never reach their destination -- they set off through hazardous, uncharted waters to find another home.

Tower of Babylon (1990) by Ted Chiang deals with a geocentric universal of the old Babylonian cosmology, where the earth is in the center of layers of celestial spheres.

It's not our floating island setting, per se, as we will see, but it's one involving earth, sky, rock, water, over and over.

The Babylonian concept: the Earth floating on the Terrestrial Ocean and the whole system, in turn, floating in the Heavenly Ocean



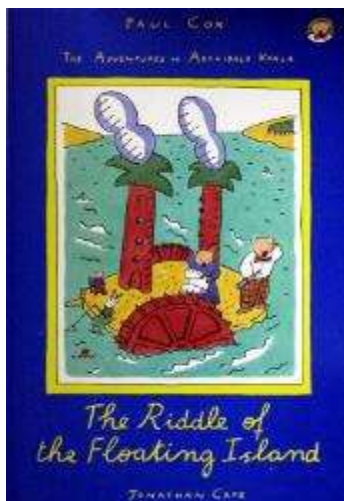
A tower is constructed into the sky, a flat plate of rock, above which heaven is presumed to exist. Passing stars of molten rock, the builders pierce the dome, and in so doing, puncture a chamber of water and unleash a flood. Continuing upward, the undaunted protagonist emerges back on Earth, more or less where he started, because -- not in the Babylonian model -- space is tightly folded.

From the story,

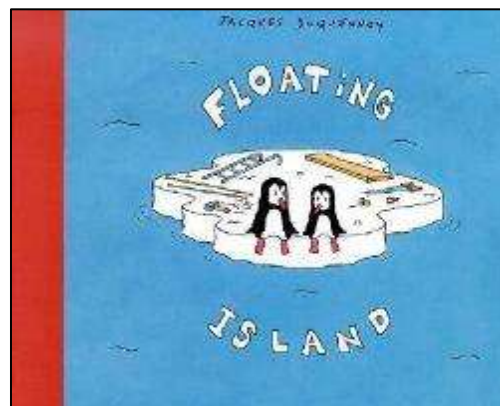
He had returned to the earth. He had climbed above the reservoirs of heaven, and arrived back at the earth. Had Yahweh brought him to this place, to keep him from reaching further above? Yet Hillalum still hadn't seen any signs, any indication that Yahweh noticed him. He had not experienced any miracle that Yahweh had performed to place him here. As far as he could see, he had merely swum up from the vault and entered the cavern below.

Somehow, the vault of heaven lay beneath the earth. It was as if they lay against each other, though they were separated by many leagues. How could that be? How could such distant places touch? Hillalum's head hurt trying to think about it.

And then it came to him: a seal cylinder. When rolled upon a tablet of soft clay, the carved cylinder left an imprint that formed a picture. Two figures might appear at opposite ends of the tablet, though they stood side by side on the surface of the cylinder. All the world was as such a cylinder. Men imagined heaven and earth as being at the ends of a tablet, with sky and stars stretched between; yet the world was wrapped around in some fantastic way so that heaven and earth touched.



The Riddle of the Floating Island, The Adventures of Archibald Koala (1992) by Paul Cox. In the Pacific Ocean is the island of Wombalano inhabited by koalas and badgers. Lately, some odd things have been happening and Badgiovanni discovers his opera costumes have been stolen.

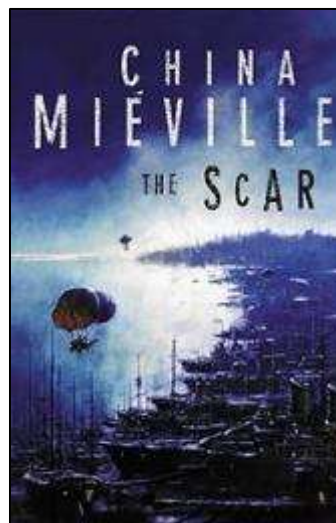


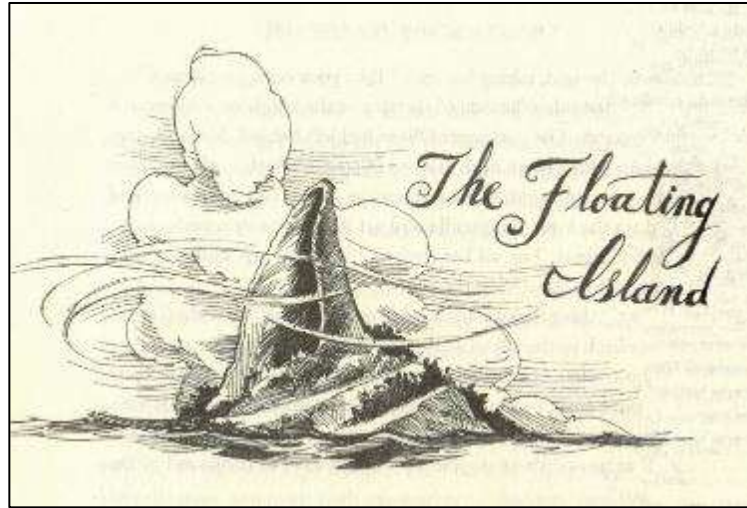
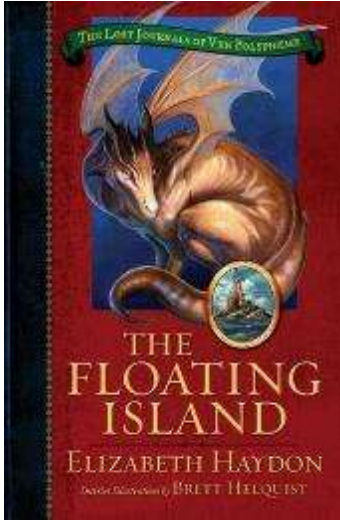
Floating Island, Adventures of Lickety-Split and Splish-Splash (2001) by Jacques Duquennoy. When Lickety-Split and Splish-Splash get separated from the other penguins after their boat's motor breaks, they decide to make the most of their time at sea and do some swimming and fishing.

In Julia Gray's The Dark Moon (2000), the Empire of the Floating Islands is a realm dominated by prophetic divination. Few notice when the Islands begin to spin out of control, in danger of collision with the mainland.

The sky became a deeper black and the distant stars shone brighter as the whole world seemed to hold its breath. For a few moments the earth beneath their feet shook, as the islands began to change course, but most people hardly noticed.

China Mieville's The Scar (2002) begins with the journey across the Swollen Ocean of Bas-Lag for the colony Nova Esperium. The ship is captured by pirates, and passengers and crew are press-ganged into becoming citizens of Armada, a floating island city cobbled out of thousands of vessels of all shapes and sizes.





The Floating Island (2006) by Elizabeth Haydon

The Floating Island must have been drifting toward them while they were rowing nearer to it. It loomed ahead, the pink sand of beaches gleaming in the sun, ringed with seaweed. The clouds that circled it were rolling still, the thick mist beginning to surround their longboat. In the center was the mountain, though Ven could not see it very well in the mist. From what he could glimpse it appeared to be covered with trees of every imaginable color.

The captain turned to his passengers.

"First, some rules and a story, before we go ashore," he said, his voice soft and serious. "This island is a ship of sorts. More than that, it is an ancient ship. As such, it is to be respected and treated with utmost care. This place is the home of the sea wind. You are about to enter the wind's garden. Anything that grows here remains here. Do not pluck a single flower, or pick a single piece of fruit. You may take nothing from this place that belongs here, even a grain of sand that can't be shaken from your boots. We are sailors, hid we cannot afford to have the wind angry with us. Is that understood?"

"It is said that when the Creator made the world, it began as a piece of a star that broke off from its mother and sped across space, until it came into orbit around the sun. So ether was the first element to be born. Fire burned on its surface, the second element. Then the fire died back into the center of the world, where it still burns to this day, and the world was covered with water, the third element. The wind, the fourth element, rose up from the water and dew it back, revealing the land, the earth, the last element."

"When the wind blew back the sea, revealing the land, a tiny piece of earth floated to the top of the waves, like a pebble or a clod of dirt in a river. That tiny piece of earth was this island.

"This island, then, was born when land was born, at the very beginning of the world, and is the child of both wind and water. So it is a very old place, a magical place. It floats about the sea at the pleasure of the wind."

The Malazan Book of the Fallen (1999-2011), a 10-volume epic fantasy by Steven Erikson, was originally created in 1982 as a backdrop for role-playing games using a modification of Advanced Dungeons & Dragons.

Drift Avalii, a floating island, lies to the southeast of the continent Quon Tali.



As for Dungeons & Dragons itself, we excerpt portions of Robert Wiese's commentary on the Floating Island adventure locale.

As darkness settles in, something large can be seen out in the sea in the distance. It is impossible to tell from here what the shape might be without using magic, but it is large even at this distance. Whatever it is, it appears blanketed by clouds or fog. During the night, the island floats toward shore, stopping about 200 feet away. It then moves along the coast and starts out to sea again in the morning. It moves about 1/4 mile per hour.

The large object is a floating island -- a rock about two miles across that has come loose from the sea floor and now poses a hazard to navigation and to life on Faerûn. Once, not long ago, a cleric of Istishia exiled himself here. This cleric incurred Umberlee's anger by using his divine powers to save a ship that Umberlee planned to sink. She smote him with a terrible curse: a wasting disease that eats away at the sanity as well as the body. Since it was highly contagious to humanoid, the cleric fled civilization to live out his life on this lonely island.

Because the curse did not die with the cleric, Istishia then used his power to cut the island loose from the sea floor and set it adrift. The god then placed a black dragon servant on the island to keep the curse safely away from anyone who would suffer from its effects... Now the island is nothing more than a floating death trap.

The terrain is mostly plains, with a large lake on the east end and the smaller lake in the center. A mountain rises on the west side. The island has a population of six half-dragon deinonychuses, two elasmosauruses in the large lake, a small herd of hylaeosauruses, and the half-dragon tyrannosaurus that protects the lake of the curse.

Fog pours out of the lake in the center of the island due to an element of the curse. In fact, the fog carries the curse, and any humanoid that stays on the island for more than an hour risks contracting the wasting disease. Many a ship's crew has fallen to this illness after stopping over for water.

If the PCs spend the night on the mainland within sight of the island, a couple hours after midnight, when the island is closest to the camp, four half-dragon deinonychuses swim from the island looking for food.

From House of Chains (2006), book four of the series,

Cutter had no idea how an island could float. If sorcery was responsible, then its power was vast, and yet, it seemed, far from perfect.

"There!" he shouted suddenly, pointing ahead where the coast's undulations dropped to a flat stretch barely a hand's width above the roiling water.

Chapter 11 -- Pursue Adventure

Clambering up alongside the prow, a coil of rope in his left hand, Cutter prepared to leap onto the shelf. As they drew closer, he could see that the stone ledge was thin, deeply undercut.

They swiftly closed. Cutter jumped.

He landed square-footed, knees flexing into a crouch.

There was a sharp crack, then the stone was falling away beneath his moccasined feet. Cold water swept around his ankles. Unbalanced, the Daru pitched backward with a yelp. Behind him, the boat rushed inward on the wave that tumbled into the sinking shelf's wake. Cutter plunged into deep water, even as the encrusted hull rolled over him.

The currents yanked him downward into icy darkness. His left heel thumped against the island's rock, the impact softened by a thick skin of seaweed.

Down, a terrifyingly fast plummet into the deep.

Then the rock wall was gone, and he was pulled by the currents under the island.

A roar filled his head, the sound of rushing water. His last lungful of air was dwindling to nothing in his chest. Something hard hammered into his side—a piece of the runner's hull, wreckage being dragged by the currents—their boat had overturned. Either Apsalar was somewhere in the swirling water with him, or she had managed to leap onto solid sandstone. He hoped it was the latter, that they would not both drown—for drowning was all that was left to him.

He struck stone once more, was rolled along it, then the current tugged him upward and suddenly spat him loose.

He flailed with his limbs, clawing the motionless water, his pulse pounding in his head. Disorientated, panic ripping through him like wildfire, he reached out one last time.

His right hand plunged into cold air.

A moment later his head broke the surface. Icy, bitter air poured into his lungs, as sweet as honey. There was no light, and the sounds of his gasping returned no echoes, seeming to vanish in some unknown immensity.

He was swiftly growing numb. Choosing a random direction, he set out.

And quickly struck a stone wall, thick with wet, slimy growth. He reached up, found only sheerness. He swam along it, his limbs weakening, a deadly lassitude stealing into him. He struggled on, feeling his will seep away.

Then his outstretched hand slapped down onto the flat surface of a ledge. Cutter threw both arms onto the stone.

Jack Blank and the Imagine Nation (2010) by Matt Myklusch.

Jack's hum-drum life as a 12-year-old orphan ends when he is attacked by a mechanical monster, then whisked off to the Imagine Nation, a floating island populated by superheroes.



The Land of Everbelieve (2012) by Norman Messenger
"walks," not floats, but we'll be liberal.

On the day I discovered the land of Everbelieve, I had been quietly puttering about at sea in my boat when I suddenly became aware of a spectacular-looking island I hadn't seen before. Puzzled and fascinated, I felt compelled to approach it and investigate.

When most of my exploring and recording had been achieved, I realized I had been neglecting my boat and felt I ought to check on it and pack away my carefully chosen souvenirs. This done, I looked around only to find that the island had disappeared.

The island has the unexpected ability to produce legs sporadically. These enable it to silently rise, dripping water and sand, and walk off to a fresh location, where it will settle for an indeterminate period, from a few days to several months.



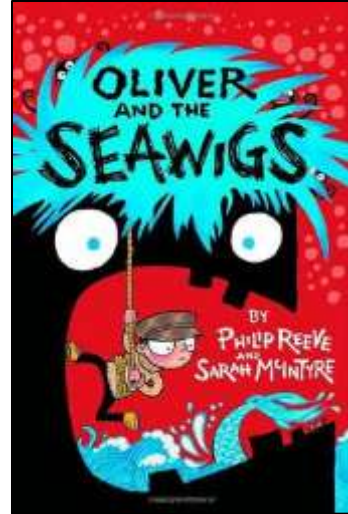
Note the setting of Princess Alice and the Dreadful Dragon (2013), by William Bernhardt. The story-line involves no floating isle, but the mention helps set the tone.

Far across the ocean, many miles from the floating island of Pamperpazoo, and just west of the underground empire of the dark and terrible Kindersnitch, lies the little known nation called Very-Mixed-Upolis, where almost nothing is what you would expect it to be.

More crucial to the plot, "Containment Zone: A Seastead Story," Magazine of Fantasy and Science Fiction, May-June 2014, by Naomi Kritzer, is set on an artificial archipelago of retired cruise ships and ocean freighters chained together and anchored into place, 220 miles west of Los Angeles.

Review of Philip Reeve's Oliver and the Seawigs. (2013). Kirkus Reviews, April, 2014, in which the island themselves are characters.

Receiving help from a nearsighted mermaid and a self-propelling island with self-esteem issues, a young lad sets out to rescue his explorer parents. Having spent all 10 years of his life climbing mountains and exploring trackless jungles with his parents, Oliver Crisp is well-equipped to chase after the Thurlstone, an evil floating island that has added his mom and dad to its elaborate crown of sea wrack. It's one of the Rambling Isles, on its way to the Hallowed Shallows for the Night of the Seawigs, a celebration held every seven years to give the islands a chance to show off all the stuff they've collected.



The cover of Perfect Ruin, The Internment Chronicles #1 (2013), by Lauren DeStefano, includes a corner of the oft-drawn sky-island of Chapter 81. The plot's formulaic, as well.

Morgan Stockhour lives in Internment, a city that floats in the sky, populated with exiles banished from the world below for being curious. Encircling the city is a train line, beyond which lies the edge. Below, "the ground" is almost imperceptible.

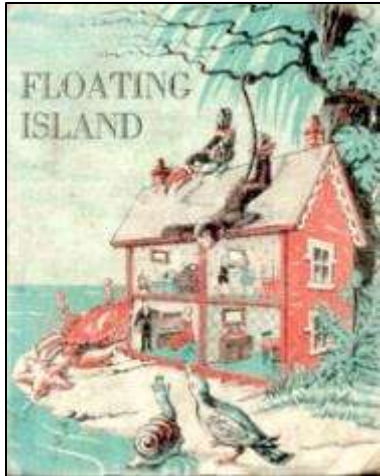
The recurring question, but how-can-this be? by an Amazon.com reviewer,

At this point, no doubt you have ten thousand questions. I did. But almost none of the basic questions you want to ask get answered -- at least not in this book. You just have to accept the idea of a floating landmass or not accept it.

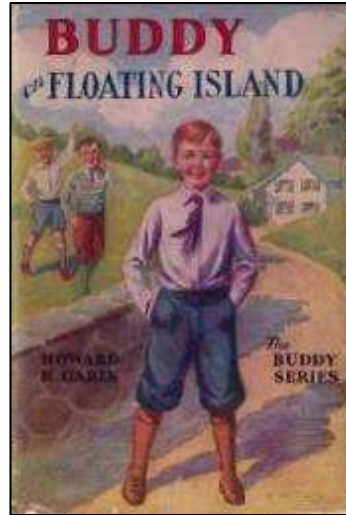
There are readers who wish to make sense of a setting, and there are those for whom the heroine's red hair and ivory skin suffice.



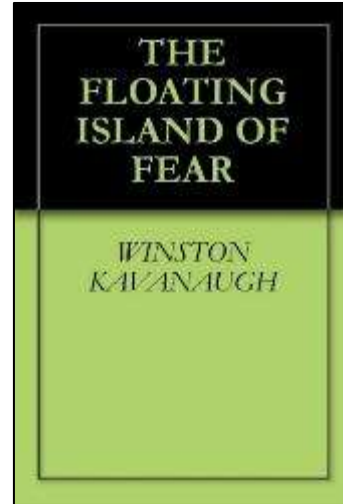
"Floating Island" in title,



Floating Island (1930) by Anne Parrish, the story of a family of dolls shipwrecked on a tropical island, together with their dollhouse.



Buddy on Floating Island, or a Boy's Wonderful Secret by Howard Garis (1933)



The Floating Island of Fear (2013) by Winston Kavanaugh. Sean journeys to a land inhabited by such creatures as Peckanders, Munthees, Vushkeevonkee, Durlavoo, Zhongh and Hairy Noses

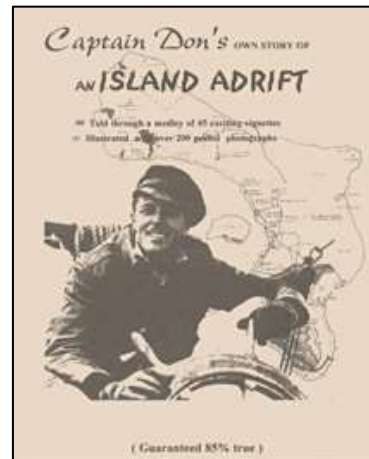
"Island Adrift" in title,



An Island Afloat (1903) by Gordon Stables



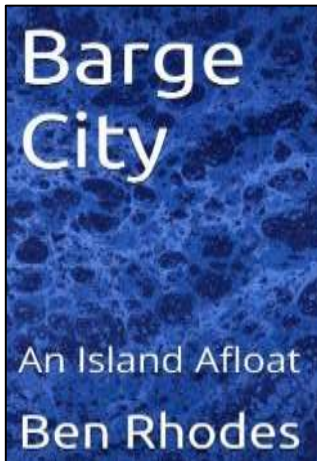
Island Adrift (2008) Nancy Baker



An Island Adrift (2002), Captain Don

DRAFT 3/30/2018

Variants of "floating island" in title



Barge City, An Island Afloat
(2015) by Ben Rhodes

And we'll end our venture into floating islands of fiction with a visit to the Philippines' Lake Lanao which has long contained large areas of the water hyacinth *Eichhornia crassipes*. From "Geologic Reconnaissance of Mindanao And Sulu: LI. Physiography," Philippine Journal of Science, November 1910, by Warren Smith,

Lakes Lanao and Kadagan.-- These two lakes are not much more than marshy areas where the Agusan River has spread out over a large tract of low ground.

Why, then, the presence of floating islands is in the lake's legends and fiction isn't immediately clear, but indeed it is.



A legend from The Maranaws: Dwellers of the Lake (1997), by Abdullah Madale,

In the olden days when Lanao was still a no-man's land, there lived a giant named Umacaan. Umacaan was so huge that he could cook with his right hand in Caloocan and still catch fish with the other in the Masiu River, some thirty kilometers away. Umacaan loved eating, but men he considered a special delicacy.

DRAFT 3/30/2018

One day, two princes, Rajah Indarapatra and Rajah Soliman... set out to slay the man-eater. Unfortunately, Rajah Indarapatra was delayed on the way and his brother, Rajah Soliman, arrived ahead in Lanao to fight Umacaan singlehanded. The puny but brave Rajah was soon subdued by Umacaan, who tricked Soliman into cutting him into severed pieces, each piece suddenly becoming another giant Umacaan.

When Rajah Indarapatra finally reached Lanao, he was told about his brother's fate by a spirit-queen. Angrily, he searched for his brother's slayer and the two combatants met near the Lanao lakeshore.



Early in the fight, Umacaan used giant uprooted trees to throw at his opponent. Then when he got tired of this, he formed balls out of soft clay which he threw at Rajah Indarapatra. Some of these clay balls fell into the lake and formed small islands while others landed on the plains, forming hills and mountains.

Today, if you go to Lake Lanao, you will notice small floating islands, some big enough to accommodate a number of families and others too small for even a single nipa hut to stand on. These islands are the clay balls Umacaan threw at Rajah Indarapatra.

We synopsise the chapter "The Floating Island" from The Adventures of Piang, the Moro Jungle Boy (1917) by Florence Stuart. The reference to Ganassi establishes the lake as the Lanao.

Piang slipped through the mouth of the creek and gazed in amazement at the vast sheet of water. Stories of the lake and its wonderful floating islands had lured him from the more direct route to Ganassi Peak, and he eagerly searched for one of the curiosities. His eyes focused on a dot of green far in the distance. It was moving, turning, and suddenly a whole fleet of dancing, playful islands became distinct. Joyfully Piang started in pursuit... As if detecting his purpose, the nomad islands eluded him. As soon as he chose one to pursue, it flaunted its charms the more and capered and dodged behind its fellows. Like a giant may-pole, the largest island held several smaller ones in leash, permitting them to revolve around it, interlacing vines and creepers that were rooted on the mother isle.

Monkeys and jungle creatures crept fearlessly along these natural ropes, sporting from one island to another... Piang caught sight of a civet-cat crouching in a tree on one island. It had probably gone to sleep in that tree while the island was nosing the mainland and had awakened to find itself adrift. Sometimes these floating islands would be held to the shore for years, intertwining liana (climbing plants of tropical forests) and baja (jungle rope), but sooner or later some wild storm is sure to set them wandering again.

Playfully Piang caught at a vine, floating in the wake of an island. The natural boat led him gently about, twisting and circling back and forth... The islands... seemed almost human in their antics. Some had regular routes, and, like mail boats touched the same spot again and again, only to be hurried on as the current caught them. Others with malicious intent strayed in the path of their more systematic brothers, bumping and jarring them with obstinate regularity.

The earth gave a tremendous jerk, which threw him on his face. He lay stunned for a few minutes and when he rose to his knees, he had the sensation of floating gently, softly. The jerking and trembling had ceased, and the ground swayed soothingly. Piang turned toward the jungle, to the spot where he had been about to step. Could he believe his eyes? Almost numb with terror, he gazed stupidly into the receding jungle. He was on land, but he was floating. He was sailing away from the jungle! Piang had taken refuge on a floating island.

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The mass of vegetation, wrenched from its bed, trailed along in the water as the nomad island whirled and danced on the angry waves. A tree, the branches of which were hanging in the water, was pulled from its bed, dragging part of the island with it.

Then came a tremendous crash. It had collided with the fleet that Piang had been sporting with only an hour before.

The island was pitching again as obstacles caught at it, spinning it around and around. Each thing that it struck on its reckless journey tore portions from it; gradually it became smaller.

The side of the island where he stood began to give way, and, although he was to die in a few minutes, instinct made him move to the other side. He tried to walk, but the ground gave at each step. He crawled along the trunk of a tree.

There were only a few moments left; if he could reach the top of the tree before the island dashed past the vines, he might save himself.

The branch that Piang was clinging to bent under his weight... Breathlessly he watched for his chance. With a prayer on his lips and with a mighty effort, he sprang straight out into space. His hands closed over something small and round.

He felt the vine tighten, heard it creak and groan under his weight, and finally it lifted him clear of the island, swinging him far out over the abyss like a weight at the end of a pendulum.



Piang is hardly out of danger, but there we'll leave him hanging.

DRAFT 3/30/2018

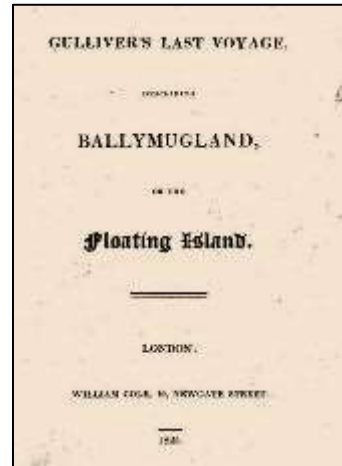
CHAPTER 12

INVENT

Floating island's inspire inventiveness.

We'll start with Gulliver's Last Voyage, Describing Ballymugland, or The Floating Island (1825), an unattributed sequel to Jonathan Swift's Gulliver's Travels (1726).

According to the manner of modern Geographers, the description of any country is usually preceded by noting its position, in relation to some other land in its vicinity, being East, West, North or South of it; a manner, in describing this island, I am sorry that I cannot conform with, as, from its floating or moving peculiarity, it is continually changing its bearings. Its greatest length, from its most Northern to its Southern point, may be about an hundred miles, and its greatest breadth from sixty-five to seventy. Its appearance from the sea, is extremely singular, as it is shelved all round by a smooth wall of natural rock, about ten feet above the surface of the land; and its aspect is rather bleak and unfavorable, as the interior of the country, as far as the eye can reach, is but thinly wooded.



Its writers universally support the fact that the island which, at present, is moveable from place to place, was, at no very distant period, as fixed and steadfast as this of Britain; and, that it was only of late that it began to take such long excursions. To an antiquarian, who happened to make to me such remarks, I suggested the probability of its having, at some former period, floated in the Atlantic, instead of the Pacific Ocean... To this, however, I could not bring him to assent, as he observed, and perhaps with some justice, that, in that case, to have attained its present situation, the island must 'have sailed round, or doubled as they call it, Cape Horn, which, to a floating mass of that size, must have been a very difficult navigation indeed.

The natural history, particularly the mineralogy and geology of the island, seems peculiarly deserving of scientific exposition... I descended into an excavation for the purpose, that under the depth of twenty feet, all over the island, there is a body of cork extending downwards to the distance of fifty more, a fact, which sets all conjecture forever at rest, as to the principle by which this immense mass maintains its buoyancy on the surface of the waters.

A bathtub experiment

I would suggest the experiment of filling a large tub with water and of procuring a piece of flat cork, five inches by six in breadth, and one in thickness; by placing which on the surface of the water, and by laying on this body whatever little substances may be at hand, as small pebbles, cherry stones, and such like, to represent houses, churches, or mountains, and by pushing this from one side of the vessel to the other, taking care not to immerse it so as to wash from its surface the substances thus put on, a tolerably correct notion of the principle of the floating island may be conceived.



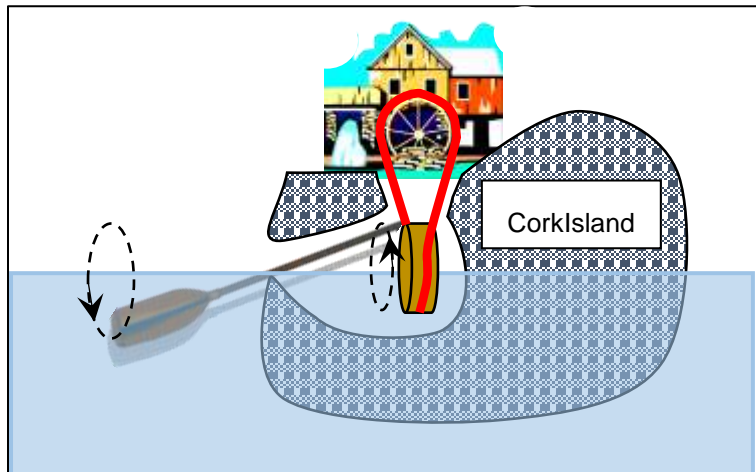
Having said this much relative to the principle by which this mass is buoyed up on the surface of the waters, the attention may now be naturally directed towards the mode by which it is propelled from place to place.

A mill-driven paddle

The mode by which the island is propelled remains yet to be explained, and was discovered, according to tradition, by an ingenious miller, whose mill happening to be near the sea side, and understanding the floating power of the island, he constructed of wood, a paddle, and having attached this to the end of a large circular beam, formed out of an entire tree, and of sufficient length, that while one end, with the paddle attached to it, was in the water, the other might come directly under the mill, he made an excavation as near to the surface of the water as possible, parallel to the axis of the mill; and having dug, directly under the mill an excavation to meet the end of the axis of the paddle, he attached a rope round a wheel at its end, which being likewise extended round the axis of the mill; the machine was thus complete, as, on the first breeze of wind, the paddle was observed to work.

Our interpretation thereof

By diminishing or increasing the powers of the mills till they should act in unison or strike at the same time, (a point in which they have since acquired great perfection, as the mills now, for leagues together around the coast, move at once, with as much ease and precision, as the performers on the different instruments at a public concert), the island was observed to move.



The island, round its coast, counts no fewer than forty-four thousand, six hundred and fifty-three propelling wind-mills.

Keep in mind that this is the knock-off Gulliver book written a century after Johnathan Swift's original. We'll look at the latter in Chapter 81, the chapter about sky islands.

"A Castle in Mid-Ocean," Maine Farmer, November 21, 1889, by Lura Bell, is likewise fiction, but the more-practical means of transport might have some merit.

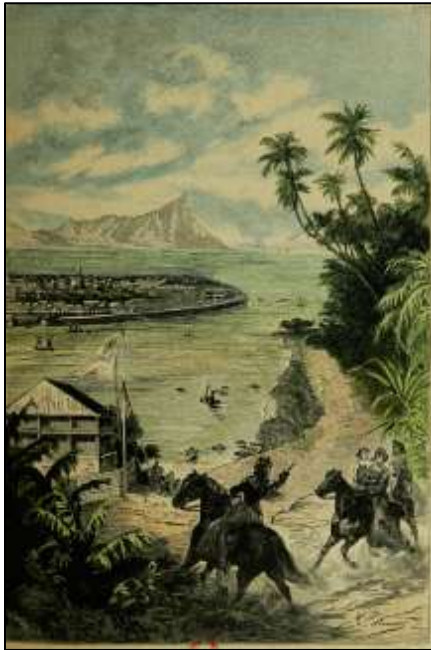
How to cross the Sargasso Sea

Once upon a time an enterprising Swedish naturalist, who, after conquering the many a more assessable world in the realm of nature, bethought him of the unexplored masses of seaweed in min-Atlantic, and persuaded a steamboat captain to sail a little out of line, that he might search amid these floating banks for new species of the algae in which he was interested. But the boat's wheels became entangled in the weeds and the captain extricated it from the tangle and resumed his course in dismay.

Afterwards he was not satisfied, however, having seen enough of the region to convince him there was something to be learned by exploring the Sargasso. He, therefore, after returning to his own land, fitted out an expedition with apparatus for propelling himself over the seaweed. His most ingenious device was a vehicle in the form of a huge hogshead with an opening at each end, and with steps all around the inside. By stepping on these, he caused the vehicle to turn over and over, while he remained safely erect inside.



Jules Verne's Propeller Island (1895), also published as The Floating Island, or The Pearl of the Pacific, relates the adventures on a massive artificial floating island inhabited by millionaires.



At this period the world was still waiting for the audacious statistical geographer who could give the exact number of the islands scattered over the face of the globe. The number, we may make bold to say, would amount to many thousands. Among all these islands was there not one that answered the requirements of the founders of Floating Island, and the wants of its future inhabitants? No, not one. Hence this peculiarly American notion of making an island which would be the latest and greatest thing in modern construction.

Verne's Propeller Island is " a Great Eastern modernized -- only several thousand times larger," a reference to the then-largest ship in the world (Chapter 47).

In a 1961 introduction to the work, I.O Evans speculates as to a deeper level of Verne's inspiration, however.

Verne spent his early life on the Ile Feydeau, then geographically separated from the rest of Nantes, and he suffered from a childish illusion that it might be torn away and swept bodily downstream by the floods on the River Loire. Propeller Islands, so to speak, the Ile Feydeau actually putting out to sea.

We've more specifications than we may care to know, but Verne was a stickler for detail.

Floating Island was an island in steel, and the strength of its hull had been calculated for the weight it had to bear. It was composed of 270,000 caissons, each of them eighteen yards high, by ten long and ten wide. Their horizontal surface represented a square of ten yards on the side, that is to say, of a hundred square yards. When the caissons were all bolted and riveted together, they gave the island an area of about twenty-seven million square yards. In the oval form which the constructors had given it, it measured about four and a half miles long and three broad, and its circuit in round numbers was about eleven miles.

Floating Island drew thirty feet of water, and had a freeboard of twenty feet. In volume it was about 430,000,000 cubic yards, and its displacement, being three-fifths of its volume, amounted to 258,000,000 cubic yards. The whole of the caissons below the water line had been covered with a preparation up to then undiscoverable, which had made a millionaire of its inventor-which prevented barnacles and other growths from attaching themselves to the parts in contact with the sea. The subsoil of the new island was made safe from distortion and breakage by cross girders, riveting and bolting.

The three quarters of the soil of Floating Island devoted to vegetation amounted to about thirteen square miles, in which the park lawns afforded permanent verdure, and the carefully-tilled fields abounded in vegetables and fruits, and the artificial prairies served as grazing ground for the flocks and herds. Electro-culture was largely employed, that is to say, the influence of continuous currents, the result being an extraordinary acceleration of growth and the production of vegetables of remarkable dimensions, such as radishes eighteen inches long and carrots weighing seven pounds apiece.

Floating Island did not cruise about at a venture. Its position was in accordance with a program drawn up by the administration, at the advice of the meteorologists of the observatory. It was a voyage open to modifications, however-across that part of the Pacific containing the most beautiful archipelagoes, avoiding as much as possible sudden bursts of cold or heat, which are the causes of so many pulmonary affections.

Propulsion

A factory appeared, its iron chimneys rising from its low, rough glass roofs. These chimneys, strengthened by iron stays, resembled those of a steamer under way, of a Great Eastern whose hundred thousand horses were driving her powerful screws, with this difference, that instead of black smoke they were only emitting mere threads which in no way injured the atmosphere.

This factory covered about ten thousand square yards. It was the first industrial establishment the quartette had seen since they had started on their excursion, under the American's guidance.

"And what is that establishment?" asked Pinchinat.

"It is a factory worked with petroleum," replied Munbar, looking as though his eyes would perforate his glasses.

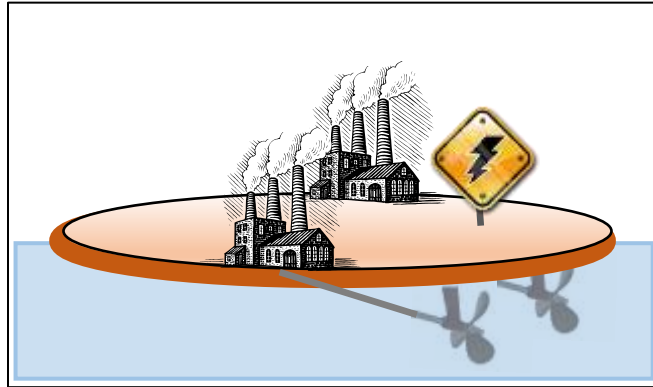
"And what does this factory manufacture?"

"Electrical energy, which is distributed through the town, the park, the country, in producing motive force and light. At the same time, it keeps going our telegraphs, telautographs, telephones, telephotes, bells, cooking stoves, machinery, arc lights, incandescent lights, aluminium moons, and submarine cables."

They could hear the dull rumbling of the huge factory, the vigorous becomings of the steam, the clanking of the machines, the thuds on the ground, bearing witness to a mechanical effort greater than any in modern industry. Who could have imagined that such power was necessary to move dynamos or charge accumulators?

At this period electricians had fortunately so far advanced that they could obtain almost anything from electricity. And it was to it they entrusted the locomotion of their island. Two establishments were enough to drive dynamos of enormous power, furnishing electrical energy by continuous current under a moderate voltage of two thousand volts.

These dynamos drove a powerful system by screws, placed near the two ports. They each developed five millions of horsepower, by means of their hundreds of boilers fed with petroleum briquettes, which are less cumbersome, less dirty than oil, and richer in caloric.



Verne consulted his brother Paul as to the feasibility of an island navigable, in the absence of a rudder, by regulating the speed of the propellers on its port and starboard sides. A century later, "dynamic positioning," as such a system would be now called, is an established technology, but no one advocates replace conventional mooring.

The maximum speed to which the island could attain, when the engines were developing their ten million horsepower, was eight knots an hour. The most powerful waves, when raised by a storm, could have no influence on it. Its size rendered it unaffected by the undulations of the surge. Fear of sea-sickness there could be none.

The best engineering, however, can't make Floating Island cyclone-proof.



A follow-up: "Monument to Jules Verne," New York Press, June 6, 1909,

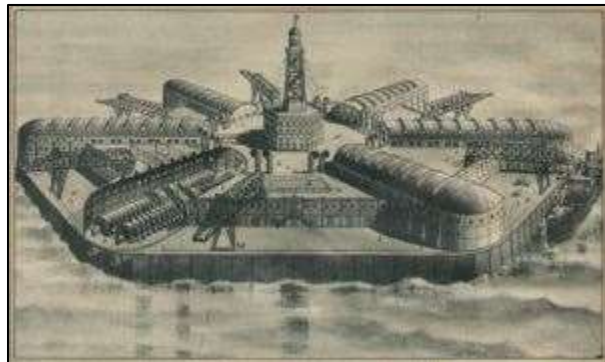
As he once told the present writer, his story of "Screw Island" was suggested by a paragraph in an American Sunday newspaper. It is a kind of floating island carrying an entire happy population. "It, too, will happen someday," said Mme. Jules Verne

A legacy: the millionaires' lure for a floating tax haven, as illustrated by "Parting Tax from Bankroll," New York Evening Telegram, September 12, 1921

One of the "most unique" propositions advanced was to establish a floating island outside of the three-mile limit.

The parties who attempted to interest Mr. Rickard in the floating Island proposition "guaranteed" him patronage of half the millionaires in America if he would establish a sort of a country club annex on the island. Mr. Rickard certainly gets many a laugh out of his morning mail.

To the right, a concept by Georges Claude (developer of neon tube lighting), "Like a Vision of Jules Verne or H.G. Wells: A Floating Island," from a 1926 New York American Pictorial Magazine.



The "Like a Vision" is appropriate, as neither Verne nor Wells published a description of such a construction.

Verne's A Floating City, is discussed in Chapter37.

Originally published in England in 1851, "The Floating Island" by Charles Clark appeared in America as the title story in The Fortunate Island and Other Stories (1882). Prof. Everett Baffin and his daughter Matilda are shipwrecked on an uncharted island floating in the North Atlantic.

Right ahead, not distinctly outlined, but visible in a misty sort of way, he thought he discerned land!

At first he could not believe the evidence of his sight. The captain, an expert navigator, had assured him that they were eight hundred miles from any shore. But this certainly looked to the Professor very much like land. He examined it through his glass. Even then the view was not clear enough to remove all doubts, but it strengthened his conviction, and when Matilda looked she said she knew it was land. She could trace the outline of a range of hills.

"Tilly," said the Professor, "We are saved! It is the land, and the raft is drifting us directly towards it. We cannot be sufficiently thankful, my child, for this great mercy! Who would have expected it? Taken altogether, it is the most extraordinary circumstance within my recollection."

"Captain Duffer must have made a miscalculation," said Tilly. "The ship must have been off of her course when she sprang a leak."

"It is incomprehensible how so old a sailor could have made such a blunder," replied the Professor. "But there the land is; I can see it now distinctly. It looks to me like a very large island."

The pair meet the Hermit, a most odd fellow, who does his best to explain the situation.

"And now tell me where I am."

"You spoke of England a moment ago," said the Hermit. "Let me begin with it. Hundreds of years ago, in the time of King Arthur, of noble fame, it happened, by some means even yet not revealed to us, that a vast portion of that island separated from the rest, and drifted far out upon the ocean. It carried with it hundreds of people -- noble, and gentle, and humble. This is that country."

"Indeed!" exclaimed the Professor. "This? This island that we are on? Amazing!"

"It is true," responded the Hermit.

"Why, Tilly, do you hear that? This is the lost Atlantis! We have been driven ashore on the far-famed Fortunate Island! Wonderful, isn't it? Taking everything into consideration, I must say this certainly is the most extraordinary circumstance I ever encountered!"

"Nobody among us has ever heard anything from England or of it, excepting through tradition. No ship comes to our shores, and those of us who have builded boats and gone away in search of adventure have never come back. Sometimes I think the island has not ended its wanderings, but is still floating about, but we cannot tell."

"But, my dear sir," said the Professor, "you can take your latitude and longitude at any time, can't you?"

"Take what?"

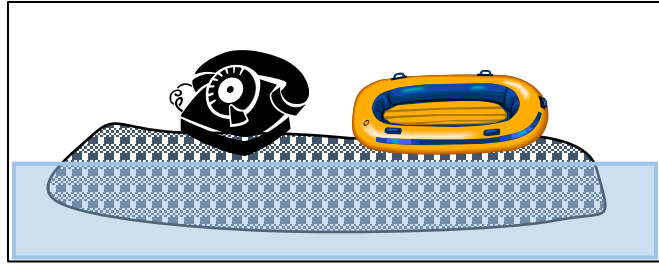
"Your latitude and longitude! Find out exactly in what part of the world you are."

"I never heard that such a thing was done. None of our people have that kind of learning."

Baffin is taken for a wizard when he does such things as igniting matches and smoking.

Matilda is swept into the chivalrous Royal Court while her father is busy inventing such amenities as the patent India-rubber life-raft and the telephone.

If the book doesn't seem to resemble Samuel Clemens' A Connecticut Yankee in King Arthur's Court, it's only because we haven't begun to list the parallels.



Just before Connecticut Yankee was published in 1889, Clark sent Clemens a telegram charging plagiarism. Clemens responded that he'd encountered The Fortunate Island only recently, but the correspondence between particular scenes, e.g. a pistol vs. a belligerent knight in armor, suggests that Clemens may have enjoyed the earlier English release in his impressionable years.

Walter Wentworth's The Drifting Island, or The Slave-Hunters of the Congo (1898) is a sequel to Kibboo Ganey, or, The Lost Chief of the Copper Mountain (1894) in which our heroes cut free a buoyant peninsula to form a floating island by witch to cross Lake Chad.

The boys saw that they had been blown across a kind of bay, and were now approaching one of its outlying arms. Glad enough they were to see the shore, and presently Bob pointed out a flock of birds lying not far from the island; but he and Ted agreed that it would not be wise to fire a gun at anything in this place, as the noise of the shot might bring down upon them some troop of barbarians who would make short work of them.

"Don't you remember that other floating island that we heard of?" said Ted. "It is out in Idaho, in the United States; and it is said to drift about over the lake where it floats, with every change in the winds."

On the floating island in Idaho, see Chapter 37.

The boys waited with great excitement for the island to reach the mainland.

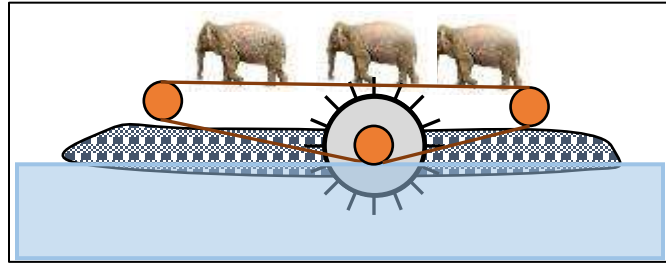
The knowledgeable Colonel Leslie provides some guidance.

"As for the difficulty of getting the island here, I would manage it in this way. I would cut down the tops of the trees to reduce as much as possible the influence of the wind upon it. Then I would make use of two large paddlewheels, one on each side; and I would work them by Nap's elephants and several treadmills."

He had computed the square surface in the wheels and the amount of resistance to be overcome; and he showed that the island could be made to obey the impulse, and could be moved, though slowly, in any desired direction by the means he suggested. As for the steering it, he would not have any rudder; he would have the wheels work separately, and the direction of the craft could be controlled by using either of the wheels alone.

As for the elephants, he judged that three on each wheel would be enough.

One or two corners and angles of the island were cut off bodily, and it was trimmed into shape, so to speak, and made to conform roughly to the outline of a ship.



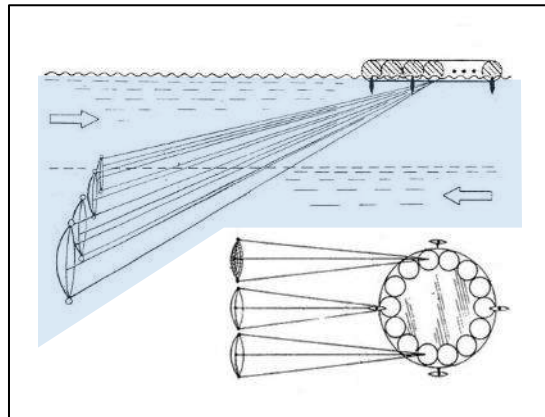
For as much as one half minute after the paddlewheels began to revolve, they churned the water without the slightest movement being perceptible on the part of the strange ship. But Colonel Leslie had expected this, and had spoken about it. He said that there was so much inertia to overcome, the island being so ponderous, that the first minute's force would be used up in overcoming this inertia. After that was overcome, and the island began to move, then that same inertia would be useful in overcoming any external resistance that might be encountered.

The island seemed to gather its speed very slowly, not reaching its maximum in less than ten or fifteen minutes. But when fully under way, its rate of speed was somewhat faster than a man could walk.

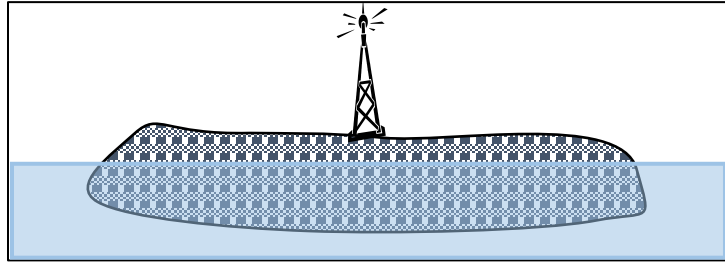
The equatorial undercurrents of the Pacific, Atlantic and Indian oceans are several hundred kilometers wide, roughly 100 meters below the surface and flow to the east, opposite to the wind-driven current above. Top undercurrent is about 1.5 meters/second, roughly double that on top.

Floating Island Apparatus and Method of Control, U.S. 6,694,910 B1, 2004, hopes to take advantage of the phenomenon.

A floating island apparatus and method of operation in which a floating main body is connected by a cable system with an underwater sail. The cable system is operated to adjust the sail orientation in an underwater current to regulate the magnitude and vector of forces on the sail. This controls the floating island by enabling the forces on the sail to either move or hold stable the main body.



And of course we know to whom to turn when more inventions are in order. We'll visit Tom Swift and His Ocean Airport (1934) in Chapter 57, but here we'll give credit for the boy inventor's "soundless wireless."



The Blue World (1983), by Jack Vance, is set in a water world with "floats," buoyant islands of several acres formed by the spreading tops of gigantic sea plants. These floats allow the inhabitants to obtain food from the sea and to produce derivate products with which they make clothes, dwellings, boats, and even communication towers.

Another caste, the Larceners, constructed the towers, which customarily stood sixty to ninety feet high at the center of the float, directly above the primary stalk of the sea-plant.

There were usually four legs of woven or laminated withe, which passed through holes in the pad to join a stout stalk twenty or thirty feet below the surface. At the top of the tower was a cupola, with walls of split withe, a roof of varnished and laminated pad-skin. Yard-arms extending to either side supported lattices, each carrying nine lamps arranged in a square, together with the hoods and trip-mechanisms.

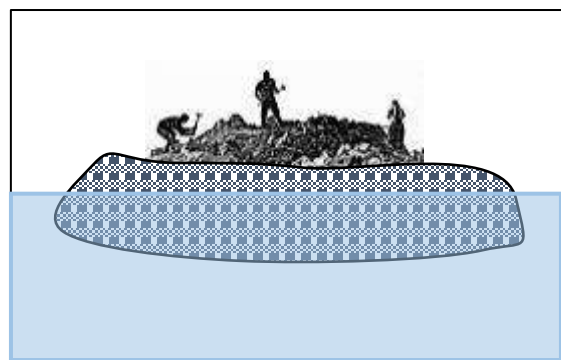


Until the time of the First Crusade, there are records of pilgrims visiting the holy sites of the "Western Islands," but not until Leo Frankowski's The Fata Morgana (1999) do we know where these islands are. "Fata morgana" means "mirage," a phenomenon discussed in Chapter 21.

The Western Isles of yore, we are informed, was a chunk of tenuously anchored lava off of the coast of France until the year 1099 when it broke loose. Since then the isle has been floating free, isolated from the rest of the world. How could a chunk of "feather-rock" have floated free for so long without being discovered, we ask? At only a number of square miles, we are informed, it was too minute to show up on satellite images,

A pair of engineers on a ferro-cement yacht run unexpectedly aground on the floating island and encounter an archaic civilization devoid of metals and minerals. The two decide to make the best of their situation and become wealthy from the metals in their capsized yacht.

The two must figure out how to keep the island from sinking. The solution: scrape the island's half-mile draft to increase the buoyancy.



Perfect Ruin (2013), by Lauren Destefano, takes place upon an island floating in the clouds, made as if a giant hand had scooped up a piece of land from below and placed it there. Why it's there, how it stays there, why it's surrounded by deathly winds, we're never told, but no matter, as our interest here is only the technology.

We have engineers who study the ground from afar and educate themselves on ways to further our own technology. Internment has evolved drastically in the last several hundred years; we've learned to set underground wires and indoor plumbing for our sinks and water rooms. The city's electricity is generated by the glass lands, which is a series of panels and globes that gather the sun's energy and store it so that it can be converted into electricity. But there are ground technologies we don't use because the king believes they would complicate our world, make it too dangerous. The king says that the ground makes people greedy and wasteful, while the people of Internment are resourceful and humble.

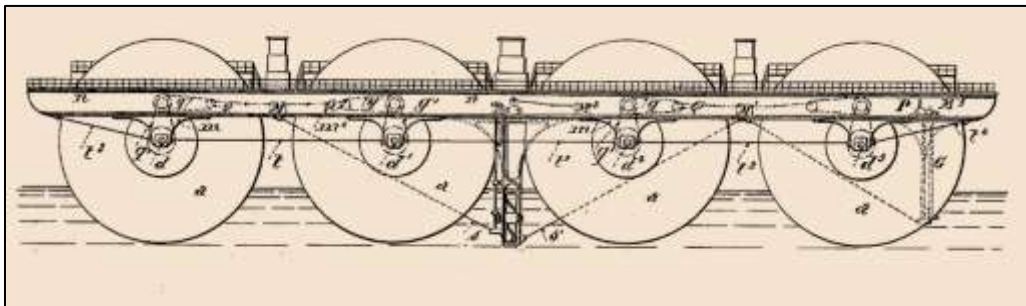
The concept of propelling a watercraft by means of a rotating disk had a modest beginning, as illustrated by this 1869 engraving of a water velocipede.



It wasn't long, however, before the spinning disk idea mushroomed to include potential applicability for island-sized vessels.

Ernest Bazin is credited with the first grandiose design, a "roller boat" that could cross the Atlantic at 60 kilometers/hour. From his "Roller Vessel of Boat, Patent 507,099, 1898.

The object of the present invention is to provide practical arrangements whereby the friction of rotatory multiple keels or rollers can be substituted for the friction of a hull with a single fixed keel, slipping or sliding in and through the water, thereby replacing sliding ships by what may be called roller ships.

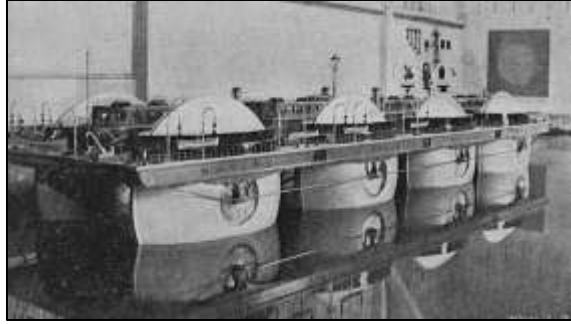


The key to Bazin's concept are smooth disks -- as opposed to ones finned or bladed -- in order to minimize frictional drag.

Smoothness sounds good until we envision the propulsion efficacy of a friction-free disk. Its slicing the water would impart no tractive push. It's why a paddleboat has paddles.

Once moving, Bazin's 1:25 model had enough roughness to, once started, move forward, just not bite enough to start its journey.

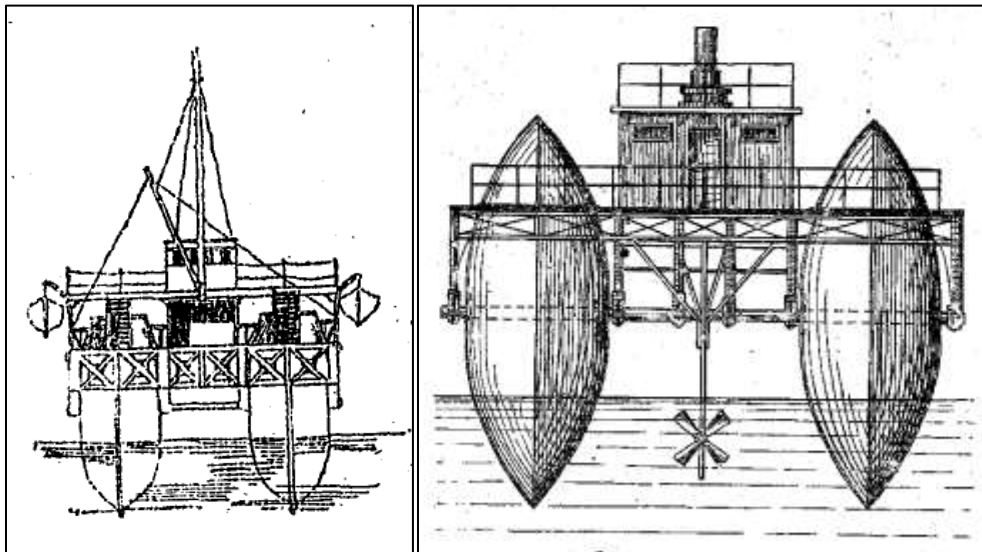
Bazin accordingly modified his design to include a center propeller with enough power to propel the model..

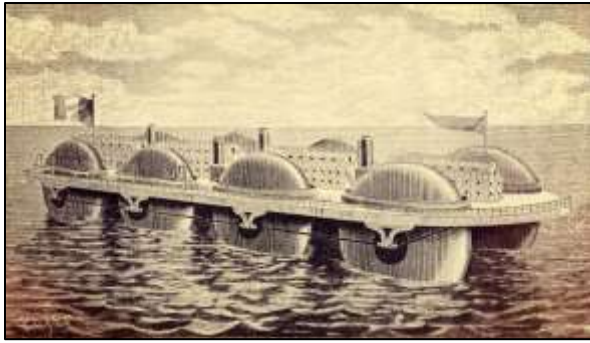


From "A Steamer on Wheels", Strand Magazine, October 1896, by James Smith,

[Bazin's] experiments told him that for the propulsion of a boat on rollers, he could not depend simply on the revolution of the wheels, but would have to unite the revolving movement with a movement forward.

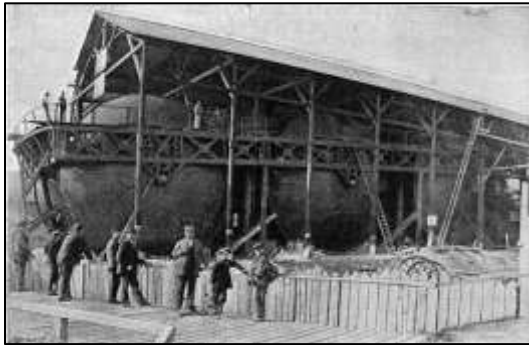
A cord attached to a framework on six wheels was passed over a pulley, carrying a weight of 200 grams. The boat was then put in position at the end of the tank, and was drawn forward by the gradual fall of the weight at the end of the cord. The passage across the tank occupied twenty-three seconds. Then, in addition to the propulsive movement given by the weight, the wheels were put into rotation by clockwork, and the boat went across the tank in eleven seconds.





Bazin field-tested his concept with 280-ton prototype propelled by six lens-shaped 12-meter disks, 3.6 meters thick at the axis, immersed to a third their depth. An 86x12.5 meter iron platform contained the coal-fired 550 horse-power engine.

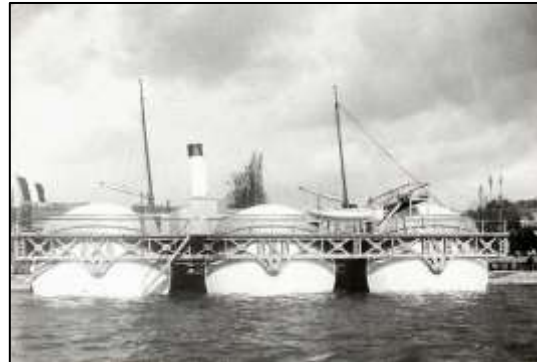
As the displacement of the third-submerged wheels is roughly 300 tons, the design makes hydrostatic sense.



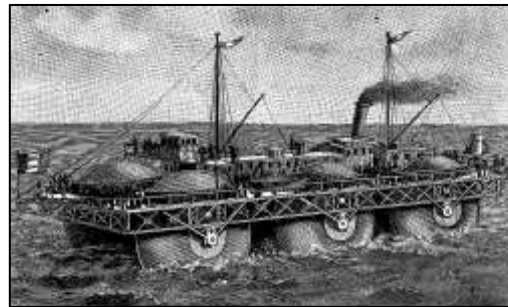
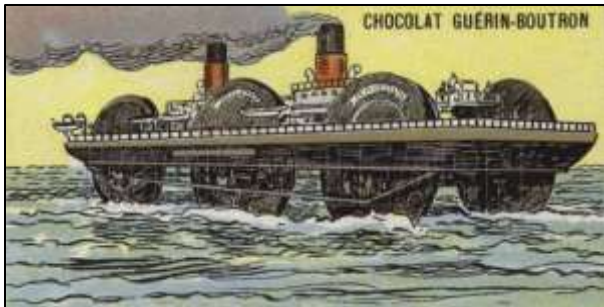
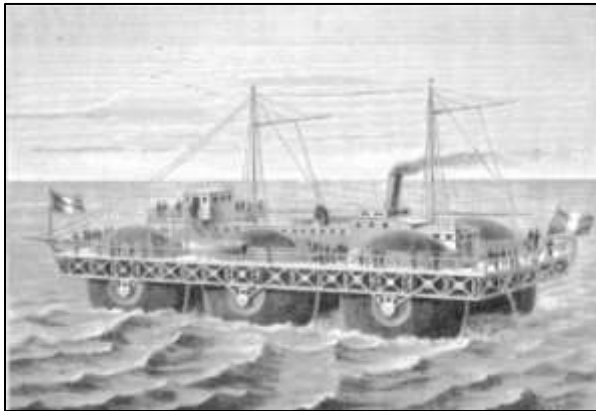
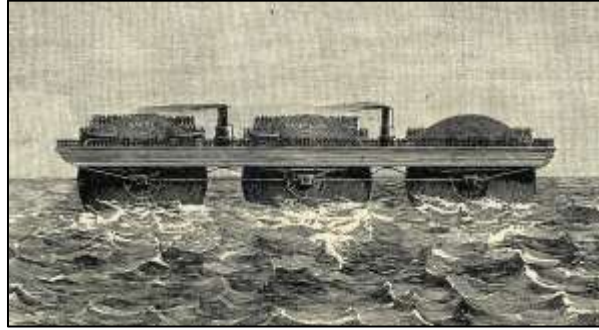
In construction



On the Seine



To the right and following, artistic renditions of a speedy Atlantic crossing.



A practical consideration, from New York Times, August 30, 1896

As a war vessel the roller ship would be subjected to many risks. As a large portion of the rollers are above the water, these would furnish an excellent target for an enemy's fire. If such a roller had a hole in it, it would fill at once with water and the craft might heel over.

Bazin's problems, however, were more than bellicose vulnerability. We said earlier that the design makes hydrostatic sense. The devil's in the hydrodynamics, and adding to tractive inefficiency was the problem of water lifted upwards.

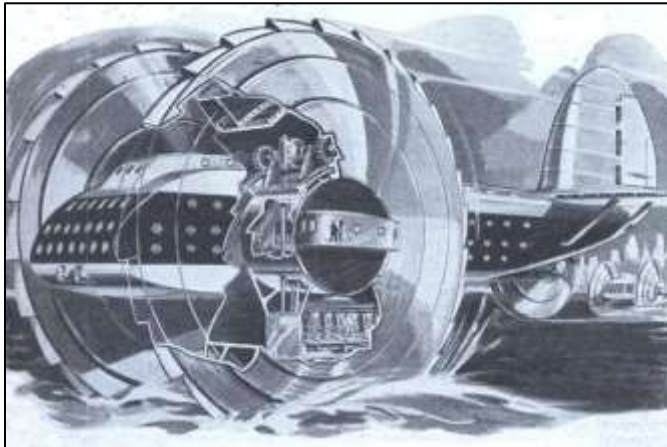
Bazin predicted his craft would achieve 30 kilometers/hour, but in an attempt to cross the Channel, it made no more than 7 and turned back, never to sail again.

Awaiting scrapping, 1900



F.G. Moon's 1899 design employing four rolling cylinders, "a shed on four wheels," was floated on the Rideau Canal in 1901, but like Bazin's, did not prove viable.

"Turbo Wheel Liners to Speed Across Seas," Modern Mechanix, June, 1934. Note the reference to floating airports (Chapter 57)



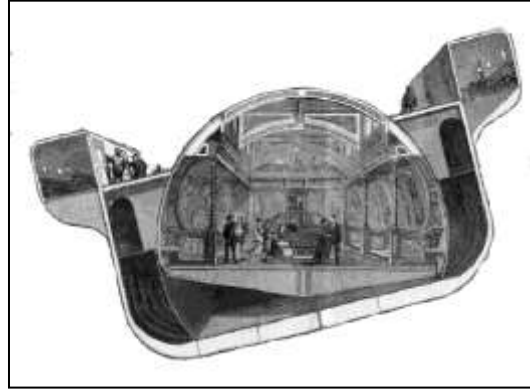
Even a streamlined ship will not be able to meet the competition of regular airplane schedules touching airports anchored in the ocean. Resistance from wind is great, but the sea itself slows down an ocean liner much more.

To overcome this an inventor has conceived the Turbo Wheel liner, which is expected to reach a speed of 100 miles an hour. At this speed the rapidly revolving wheels of the liner will lift the hull out of the water. The ship will ride on the outer rim of the wheels only.

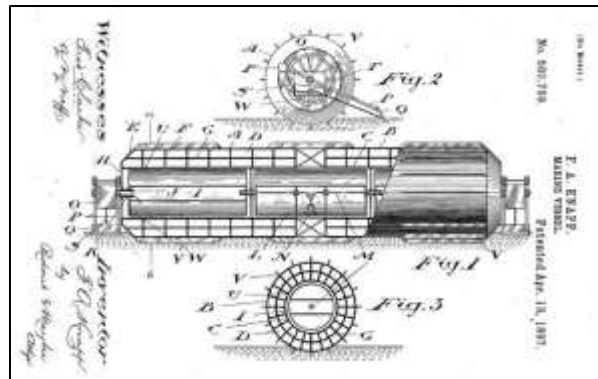
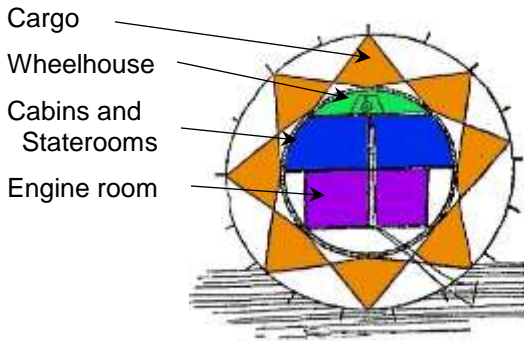
A lifting tail of airplane type holds the hull parallel to the line of travel. Normal airplane rudder and tail flaps control steering at high speeds.

But if rolling disks might work, then why not widen them to form a rolling drum with the vessel's load within?

For the passengers to not themselves rotate would require rounding the nested hulls of Henry Bessemer's roll-resilient design for a sea-sickless 350-foot passenger vessel with a 70x30x20 foot saloon and extending them into complete circles. One could -- but wouldn't have to -- replace the interior water with rollers.



Frederick Knapp's 1897 250-meter "roller boat" concept was hoped to convey 100 passengers at 100 kilometers/ hour.



Those desiring fresh air could visit a platform protruding from either end. The craft could be unloaded by means of railway trains which could be run through the hull.

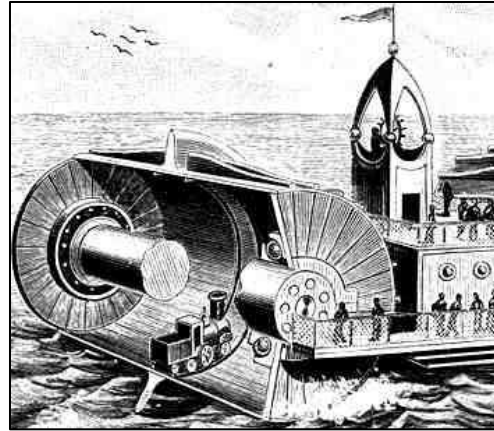
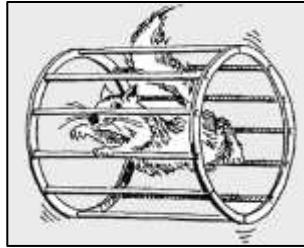
Knapp's prototype was a 34 meters long, 7 meters in diameter.



Chapter 12 -- Invent

Propulsion was by means of engines mounted on endless rails which climbed the inside as a squirrel spins the wheels of its cage.

To the right -- not Knapp's design, as evidenced by the paddleboat vessel -- an illustration of the power scheme



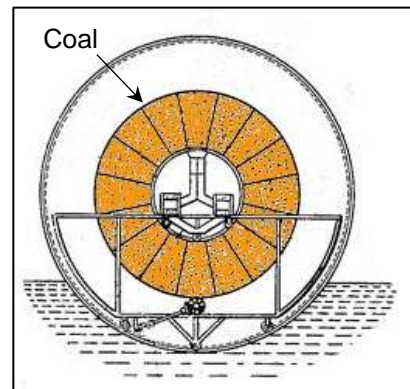
At its launch in Toronto, Knapp's bright red boat quickly became stuck on a harbor mud bank.

It later achieved a few kilometers/hour in Lake Ontario before breaking down and again beaching .

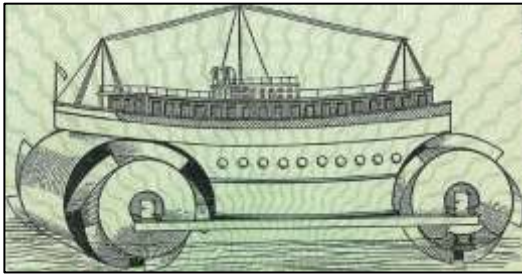


The vessel was subsequently shortened to 24 meters to be operated as a passenger ferry, but on its maiden trip, it again ran aground. It was later converted for coal-hauling, the rolling mechanism moved to one end, the ends sealed with a hole cut for a wheelhouse

When it again ran aground, the vessel remained wedged in the mud until 1927, when it was cut apart for scrap.



A.J. Haskins' 1919 design for an "Aero-Marine Locomotive," in which two rollers would roll through water at 100 kilometers/hour, never made it past investor-seeking.



CHAPTER 13

SQUANDER HOURS ON MATINEES, COMICS AND VIDEO GAMES

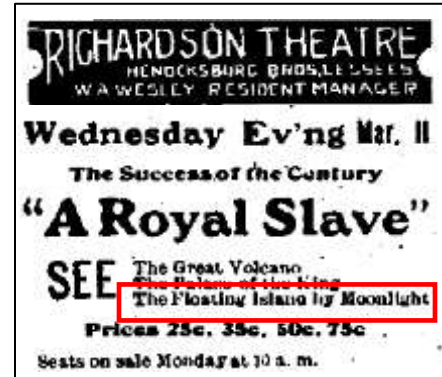
Matinees

"A Royal Slave" (1900) is a melodrama by Clarence Bennett

See the Floating Island by Moonlight

The island in the script, however, is one of black rocks, not the floating variety. The only suggestion of "floating" is found in the staging,

*Set waters of sea-cloth from 3 down to ground rows in
1. Waters to dive under in front of island platform.*



There are films about islands that float and then there are films in which the set-builders float an island for filming that's passed off as stationary. A review of "Cuban Love Song," Long Island Daily Press, March 18, 1932, illustrates.

A floating Island is the latest departure in picture making. In "The Cuban Love Song," Lawrence Tibbett's new Metro-Goldwyn-Mayer starring picture, he and Lupe Veles play a vivid love sequence on a small island in a lagoon in the tropics. The episode is one of the important dramatic highlights in the new picture, which will come tomorrow to the Alden theatre.

The lagoon had no island. To build one would require tons of rock and earth. So studio technicians got a barge, built up the Island with sod' and trees on this, towed it into place and anchored it -- and the floating island made a perfect setting.

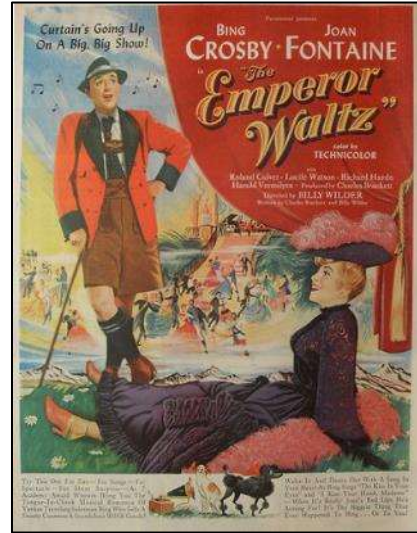
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"The Emperor Waltz" (1948), starring Bing Crosby and Joan Fontaine, is set in Austria, but was filmed in Canada's Jasper National Park, where on an assemblage of earth, rock and trees on platform of floating drums in Leech Lake, Fontaine tells Crosby to cease crooning.

The island was ceremoniously ceded to Canada before the film crew departed.

From "'Island' Is Ceded to Canada by U.S.," Brooklyn Daily Eagle, July 14, 1946,

Emperor Island, built by a motion picture company in Jasper National Park, Canadian Rockies, has been ceremoniously transferred from United States custody to ownership by the Dominion of Canada. The quarter-acre floating island was constructed and launched on Leach Lake in Jasper as a setting for the film "Emperor Waltz." The presentation was made to Major J.A. Wood, superintendent, Jasper National Park, by Joan Fontaine, motion picture actress.



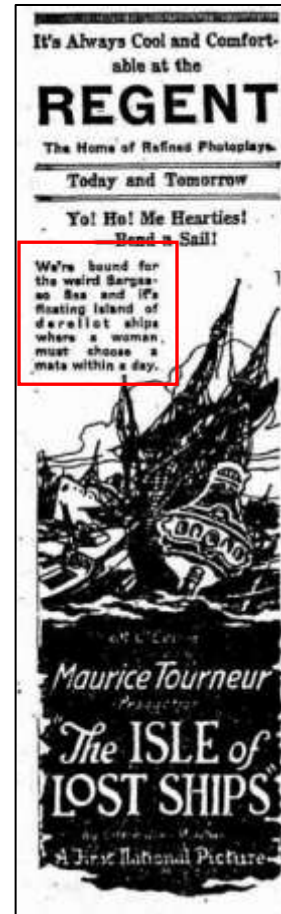
"Build Island for Movie Film at Jasper," Grandview Exponent, September 5, 1946,

Canada owns a new island. One quarter acre of floating island, complete with fir trees and grass, can now be viewed in Jasper National Park where, in Leach Lake, Paramount Studios of Hollywood built this special location for a love scene in their latest picture "The Emperor Waltz". It has unofficially been named "Emperer Island". After Joan Fontaine and Bing Crosby completed their last scene on this island, it was officially turned over to Major J.A. Wood, superintendent of Jasper National Park, to be used as a tourist attraction. The island blends in perfectly with its surroundings and can be viewed on the drive from Jasper to the Columbia Icefield.

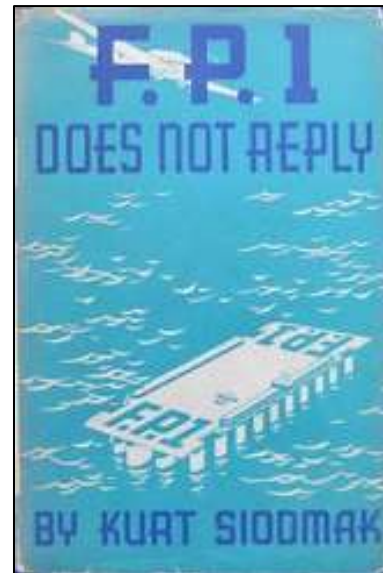
As far as ceded sovereignty, the publicists wrote the script. Paramount carpenters rebuilt the island in Hollywood for additional scenes.

The Isle of Lost Ships (1930) is shipwreck adventure on a floating island the Sargasso Sea. "From shipwreck at the beginning to escape by submarine at the end, The Isle of Lost Ships is a series of thrills for the hero and heroine," according to the publicist.

We're bound for the weird Sargasso Sea and its floating island of derelict ships where a woman must choose a mate within a day



While plans for a mid-Atlantic floating island as a supply station for transatlantic airplanes were shelved with the Depression (Chapter 57), the idea provided grist for the 1932 novel F.P.1 Doesn't Reply by Kurt Siodmak. The abbreviation stands for "Floating Platform No. 1," a 1,500 by 450-foot landing strip half-way between Europe and America.



The film version was billed as a "Melodrama of Future Aviation."

A bit of the novel,

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The FP 1 was indeed a wonder, such as any sailor might be proud to have committed to his charge. It was an immense structure of steel and glass of truly gigantic proportions, a veritable floating island, displacing two hundred thousand tons. When safely anchored, it would provide a port of call, a convenient landing place for aircraft traveling between Europe and America. There they could refuel or refit or disembark passengers, for whose convenience a first-class luxury hotel had been constructed, overlooking the landing platform.

The upper portion of this remarkable leviathan consisted of a large steel platform, four hundred and fifty feet wide and over a quarter of a mile in length. On each side of the platform, which provided an ideal aiding place, was a long range of buildings. On one side were the hangars, the repair shops, the storage tanks, and the dynamo houses where the electric power for the whole structure was generated. On the other side stood the hotel, with a magnificent glass façade looking out over the sea. It contained three hundred bedrooms with private baths, numerous public rooms, lounges, swimming baths, -- in fact, all the most luxurious, up-to-date appointments of a modern first-class hotel.

The platform itself rested on immense buoys, extending one hundred and fifty feet below the water, passing through the restless upper waters of the sea, far down into the motionless depths. Thanks to this, these buoys, when filled with water as ballast, would anchor the FP 1 to one spot as firm and immovable as a rock. To make assurance of its complete stability doubly sure, however, when it was anchored, enormous steel dragnets were to be dropped from the buoys. Spreading out like the roots of a giant tree, the nets were intended to attach the FP 1 securely to the bed of the ocean. It would be in effect, if not in fact, an island.

The platform, when anchored, would be seventy-five feet above the surface of the sea and thus well out of reach of even the highest waves.

Nothing had been forgotten to perfect its working arrangements for the reception of aircraft. Four powerful cranes had been erected to facilitate the handling of all types of aircraft, particularly in the raising of seaplanes to the platform from the sea. A small electric railway was provided to haul the aircraft into the hangars. Automatic electric lifts and trapdoors gave means of access to the sea underneath the platform, where there was a small jetty and tunnel exit to the open sea for the use of the large motor boat which the FP 1 carried.

Spring, Summer, Fall, Winter... and Spring (2003) is set on a floating monastery on a lake in a beautiful Korean valley, where an old monk and his young disciple live an austere existence)



Emir Kusturica's Underground: Once Upon a Time There Was a Country (1995). The dead protagonists return to life and attend a wedding feast on the shore of the Danube. The piece of land upon which they are standing floats away from the mainland, but they are too busy celebrating to notice. It's the story of Yugoslavia.



Aga Skrodzka discusses the significance of the floating island in Magic Realist Cinema in East Central Europe (2012).

In the closing image of the film, we see the wedding party literally take off: the piece of land where the party is being held detaches itself from the mainland and drifts off down the river like a bizarre party barge, with the dead and the living continuing their revelry, not minding the fact that they are now consigned to a tiny floating island.

The image of the island floating down the Danube... illustrates the concept of the periphery as an enclosure of choice, where diverse temporalities are preserved; those from the past dance alongside those in the present. The open-endedness of this scene promises a future, despite the elected obliviousness of the participants. They agree to stay on the island, fully understanding what they are leaving behind and of what they are opting out.

The revelers on the island can see very clearly their growing distance from the immovable mainland center, but they keep dancing and navigating their new connection with the little scrap of floating land that is now their sole home. Allegorically, in an interpretation separate from the one where the basement stands for the Communist totalitarian state, the contrast between these two visions points towards a critique of nationalism in the postcolonial, peripheral context. The need to be grounded is not what is being questioned; the manner of groundedness is.

Although film scholars have evaluated the image of the floating island as a quintessential absent signifier, I would like to propose that it does indeed offer an accurate and quite concrete materialization of the concept of the interstitial East Central European periphery. The floating island, at least in Kusturica's portrayal of it, is an oxymoron of a sort -- a piece of solid ground that provides those who tread on it with a firm foundation, but this foundation remains always somewhat mobile and compromised; it is a hybrid formation.

Luisa Rivi sees "the happy island" as a "nonplace" which 'makes the dissolution of the meta-narrative of history visible and marks the notion of progress as profoundly ahistorical.' In her interpretation, the island signifies the impossibility of going on into a dialectically determined future. The island is a spatial metaphor for the dead end of linear time and the crisis of the Western notion of history. Also in terms of loss, Rosalind Galt sees the island -- the "fantasmatic" landscape -- as the embodiment of the impossible national space.

Using poststructuralist and psychoanalytic tools, Rivi and Galt theorize the floating island as the negative presence of a certain absence, the absence of historical narrative and national space respectively. But this image can also evoke a positive identification. It is almost identical to the image described by another East Central European, the writer Andrzej Stasiuk, who defines his marginal European identity in the following words:

This is what it means to be Central European: to live between the East, which never existed, and the West, which existed too much. That is what it means to be "in the middle," when this middle is really the only real land. This land, however, is never firm. It is more like an island, maybe even a floating island. Or perhaps a ship jostled by the currents and winds from east

to west and back again... To live on this island, or this ship, is to observe every shift in the wind, constantly pacing from shore to shore, or from side to side.

Instead of seeing Kusturica's image of the floating island as fantasmatic or somehow emptied out, I have always seen it as fantastically plentiful -- a crowning textual elaboration, which supplements the end of the film with a magic realist correction of the dark vision that dominated the screen till those final moments and threatened to pass as the real and realistic vision of the Balkans, of the other Europe... The crisp and well-lit image of the floating island, framed in a natural setting, suddenly qualifies all of the preceding scenes that took place underground as delusional, even if more realistic in terms of narrative logic.

"The Floating Island" episode of the television animation Nadia: The Secret of Blue Water (1990), exemplifies the attribute of a floating island as a vessel to a better place.



Noah's Island (beginning 1997) was a television animation about a collection of animals who navigate the sea on a floating island, originally part of the Canadian Coastline before being dislodged by a meteorite.

The island is able to float because of its core of molten magma, the "Fire-Bowl," a feature which also allows the island to be steered.



Candied Island in The Marvelous Misadventures of Flapjack (2008-2018).



Comics

"Binnacle Jim and the Floating Island," Los Angeles Herald, October 30, 1904



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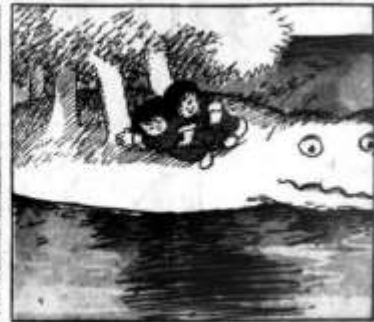
"Terrors of the Tiny Tads," May 15, 1910



"Oh, see the island!" cries Tad. "It's rising more and more. It's a floating island and it's swimming toward to shore!"*



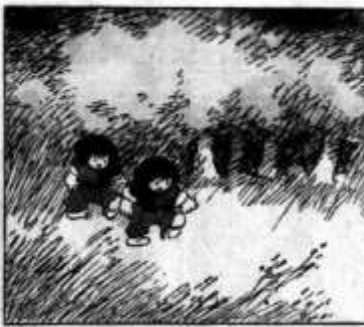
"It is a Crocodisland; we can play on him a bit, and when we're tired of playing here's a lovely place to sit"



They play until they fall asleep, and then, alas, slack! The Crocodisland swims away with them upon his back.



He takes them miles away from land; they don't know what to do "Oh, bring us back again!" they beg of a Pelicanoe.



But, once on shore, they still are in a rather sorry plight, Because they have no place to pass the fast approaching night



At last they find a great big bird where they can rest their heads. He is a Dormitoriole, all fun of rooms and beds.

Master Comics #1 (1940) Morton Murch, hillbilly from the hills of West Virginia, fashions a home-made hot air balloon that makes him a laughingstock of his hometown, but it takes him to the floating island kingdom of Felicia where he introduces aviation and becomes a national hero.



"Thimble Theater Starring Popeye," April 5, 1940,

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"Mark Trail," April 26, 1952



"Smilin' Jack," September 14, 1952,



Wonder Woman #204 (1973)

Diana steals a military jet, and heads for the floating Paradise Island where Queen Hippolyte has her dressed in her Wonder Woman outfit. She is welcomed by all the Amazons save one, an armored challenger, the "Nubia! Wonder Woman of the floating island!" Diana and Nubia embrace, and then Nubia leaves to return to her island, promising that someday they will prove which is the true Wonder Woman.



Manhattan, the epitome of American self-perceived centrality, no "floating island" in either a metamorphic or geologic sense, but Marvel Team, December 1974, pays no mind. When the City Stealers slice the Big Apple from its foundations and tow it by super-submarine into New York Bay, it's up to Hercules to pull it back into place,



Manhattan's being too wide to fit through the Verrazano Narrows and the Battery aimed up the Hudson are to be ignored.

The Voyage of Manhattan



The City Stealers' target

Theft

Hercules' repair

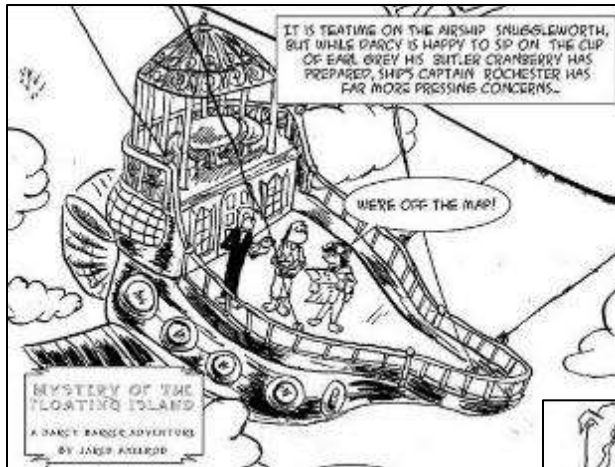
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Masters of the Universe #72 (1988) featuring the story, "Island of Terror"



Adam and Teela are sailing along the river, when Orko warns them that Eternia is under attack! Adam changes into He-Man and joins the other warriors.

Syatos finds the danger in the form of a floating island in the sky. When the heroic warriors land, Skeletor and Evil-Lyn open a trap and they all fall into the Pit of Stalagmites!



"Mystery of the Floating Island" (2006) by Jared Barker. We'll see more airships and sky islands in Chapter 81.



"Family Ties," Justice League Europe #11 February 1990

Major Disaster, with an assist from Aquaman and some of his "finny friends," causes an undersea volcano to erupt beneath the wandering island of Kooley, thus anchoring the island.



Professor Semo's floating island base in the Mexican Fantômas comic book series.



At risk of relegating the X-Men mutant superheroes of the Marvel Universe to a comprehensible storyline, Cyclops and the Phoenix Five raise a piece of Orbital base Magneto from where it had crashed into the Pacific to create the floating island nation of Utopia. They work to provide power, food and water, outlaw war and attempt to destroy all weapons, though some escape detection.

On the reflective side, perhaps the Avengers will realize Cyclops' motivations for creating the island stems from the feeling that his people are alone and uncared for by the greater community.

In "X-Men Legacy: Emplate," 2010, the X-Men think that on Utopia, they're free from the persecution of the corrupt H.A.M.M.E.R. organization, but soon they're once more under attack.



In "Sonic the Hedgehog #13 (1994) Dr. Robotnik maneuvers Sonic and Tails into fighting Knuckles, the guardian of the Floating Island, so he can steal the Chaos Emerald from the island in the confusion.

"Sonic the Hedgehog: Triple Trouble" (1995) has manifestations in both a comic book trilogy and as a video game. We'll simply make note of the saga's floating islands. "Panic in the Sky" starts off with a group of happy Mobians playing volleyball until interrupted by a shadow.



Emerald power turns out to be key to controlling the island, so Knuckles the Echidna has some green environment to overcome, but all ends well.



Video Games

Islands suspended in the sky are a staple of the video gaming landscape; their art is a staple of fantasy illustration (Chapter 81).

MapleStory is a 2-D scrolling platform massively multiplayer online role-playing game in which players travel "Maple World", defeating monsters and developing their characters' powers.

Erev is a free-floating island between Victoria Island and Ossyria Continent. Headquarters of the Knights of Cygnus, this island is peaceful under the Divine Bird's protection. Players undertake a series of quests and training given on orders of the Queen's strategist, Nineheart.

Although one may play the game for free, one can purchase enhancements from the Cash Shop with real money



Player-constructed floating island for the video game, Terraria,

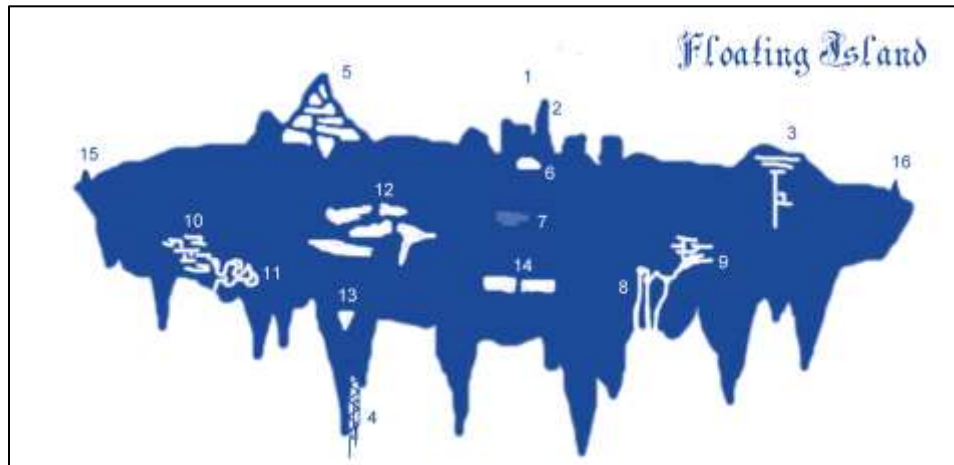


Floating island in SteamMancer

Second Life is an online virtual world in which players interact with each other through avatars. "Residents" can explore the world (known as the grid), meet other residents, socialize, participate in individual and group activities and create virtual property with a three-dimensional modeling tool that allows sculpted prims, mesh, textures, animations, and gestures. A few floating islands available for purchase.



The World of
Ortix



- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> 1. City of Gods 2. Palace Tower 3. Landing Bay (unused / deserted) 4. Sensors 5. Mountain of Doom (cursed place) 6. Great City Hall 7. Core of the City 8. Thrash Pits | <ul style="list-style-type: none"> 9. Underground Laboratory 10. Secret Mi-go outpost 11. Maze guarding the entrance 12. Natural caverns 13. Automated defense control room 14. Water reservoir 15. Western Watchtower (lower levels) 16. Eastern Watchtower (cursed place) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



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Video game islands that float upon water, on the other hand, are rare. Why foray into a 2-dimensional environment when a 3D domain is almost as easily programmed? A rhetorical reply: Would chess be a better game if played in a cubical game-space?

In Tomb Raider II, glowing green islands float on a water surface somewhere beneath the Great Wall of China.



The seagoing city of Ark, setting for the game Brink, was constructed as a five-star eco-resort for the rich and famous. The Founders' Tower rises near one corner. A breakwater of wave-absorbing ramps harvests energy from the waves.

When the seas began to rise, however, hordes of refugees, among which were criminals and those with contagious diseases, found their way to the Ark to live in floating shanties and do the physical labor to keep the island functional. Eventually, virtually every resource on the one-time utopia was rationed, but not equitably.



The Ark is divided the Upper Ark, where 80 percent of the wealth is concentrated; and the Lower Ark, a tangle of squalid, rusting slums housing 80 percent of the population. Brutal warfare breaks out as the floating island itself begins to fall apart.

In Age of Heroes, the Island of Vultarro is said to be infused with the chaos magic of Urgash. According to legend, before Urgash and Asha were ripped from each other's presence, the angry breath of the Chaos Dragon blanketed the quiet island, putting it into a state of flux.

The island has no fixed location. Every 6 to 18 months, it becomes shrouded in mist, and by the following morning the island and its residents will have phased into a new spot in the seas.

Seafarers describe seeing a vast landmass that vanishes without a ripple. Crews sailing upon open waters suddenly find their ship draped across a canopy of trees.

Wherever the island wanders, its temperature remains temperate, as though an undetectable blanket shields it.



Not all floating-island video games need be as action-packed. Take, for example, this one for young girls.

All in all, there's probably a game for everyone.



CHAPTER 14

RHYME

Per John Robinson's Guide to the Lakes (1819), the topic of floating islands may be more suited to poetry than science.

Artificial islets float on the lakes of Mexico and of China, and, however Philosophy may solve the problem in nature (of the Derwentwater one), Poetry, less scrupulous as to her authorities, has wrought the artificial image with peculiar felicity.

Let us peruse the library shelves for perhaps-dusty volumes. We'll capitalize FLOATING ISLAND for emphasis.

Luis de Camoes' Os Lusíadas (1572) recounts the glories of Portuguese explorers. When Vasco da Gama and his crew successfully pass the Cape and reach the Indian Ocean, Venus rewards them with the pleasures of the floating "Isle of Love," amply stocked with virgins.

*Before the fleet, to catch the heroes' view,
The FLOATING ISLE fair Acidalia drew:
Soon as the floating verdure caught their sight,
She fix'd, unmov'd, the island of delight.*

*In friendly pity of Latona's woes,
Amid the waves the Delian isle arose.
And now, led smoothly o'er the furrow'd tide,
Right to the isle of joy the vessels glide:
The bay they enter, where on ev'ry hand,
Around them clasps the flower-enamell'd land;*

Josuah Sylvester, "The Fifth Day: The Fishes and Fowles," Bartas: his Devine Weekes and Workes (1605),

*When on the surges I perceive from far
The Orc, Whale, Whirlpool, or huge Physeter,
Methinks I see the WANDERING ISLE again,
Ortygian Delos, floating on the main.*

The Roaring Girl (ca. 1607-10) by Thomas Middleton and Thomas Dekker, a Jacobean theatrical comedy,

*And here and there, whilst with obsequious ears
Throng'd heaps do listen, a cut-purse thrusts and leers
With hawk's eyes for his prey; I need not shew him;
By a hanging, villainous look yourselves may know him,
The face is drawn so rarely: then, sir, below,
The very floor, as 'twere, waves to and fro,
And, like a FLOATING ISLAND, seems to move
Upon a sea bound in with shores above.*

In Johnson's Neptune's Triumph for the Returne of Albion: Celebrated in a Masque at the Court on the Twelfth Night (1623), the disgraceful return of Prince Charles is celebrated in a courtly entertainment combining music, dance, dramas and stage effects.

Neptune's Triumph opens with satiric conversation between a poet and a cook, after which Neptune dispatches a floating island to fetch Prince Albion and Hippias, his master of the horse. A few of the lines:

*The Nymphs at Sea, as they were almost lost,
Till, on an ISLAND, they by chance arriv'd,
That FLOATED in the Main; where, yet, she had giv'd
Them so, in charms of Darkness, as no night
Should loose them thence, but their chang'd Sisters sight.*

*That at the Closes, from their Bottoms spring,
And strike the Air to echo what they sing.
But, why do I describe what all must see?
By this time, near the Coast, they floating be;
For, so their virtuous Goddess, the chaste Moon,
Told them, the Fate of th' Island should, and soon
Would fix itself unto thy Continent*



*Here, a Curtain was drawn, (in which the Night was painted,) and the Scene discover'd, which
(because the former was Marine, and these, yet of necessity, to come from the Sea) I devised,
should be an Island floating on a calm water. I would have had your isle brought floating in,
now,*

*In a brave broth, and of a sprightly green,
Just to the color of the sea*

*That point of revolution being come,
When ail the Fortunate Islands should be joined,
Macaria one, and thought a principal,
That hitherto hath floated, as uncertain
Where she should fix her blessings, is tonight
Instructed to adhere to your Britannia.*

For more on the "Fortunate Islands," see Chapter 2.

Robert Southey, "Madoc," 1805, an epic based on the legend of a Welsh prince who sailed to America in the 12th century on a floating isle,

*We reached the shore,
A FLOATING ISLAND waited for me there,
The beautiful work of man. I set my foot
Upon green growing herbs and flowers, and sat
Embowered in odorous shrubs: four long light boats
Yoked to the garden, with accordant song,
And dip and dash of oar in harmony,
Bore me across the lake.*

James Montgomery, "World Before the Flood," 1813

*In the free element beneath me swam,
Floundered and dived, in play, in chase, in battle,
Fishes of every color, form, and kind;
Which language cannot paint, and mariner
Had never seen; from dread Leviathan
To insect millions peopling every wave:
Gather'd in shoals immense, like floating islands,
Led by mysterious instincts through that waste
And trackless region, though on every side
Assaulted by voracious enemies,
Whales, sharks, and monsters, arm'd in front or jaw,
With swords, saws, spiral horns, or hooked fangs."*

John Fitchet, King Alfred: A Poem 3 (1813),t

*Delos we then admired, Latona's isle,
Who, (as was feign'd of old) o'er all the earth
Roaming, through fear of jealous Juno's ire,
Found on this land, (till then a WANDERING ISLE,
But now by Neptune's favouring trident fix'd,)*

Thomas Moore, "The Fire-Worshippers," Lalla Rookh (1817),

*Of in my fancy's wanderings
I've wished that little isle had wings,
And we within its fairy bowers
Were wafted off.*

Dorothy Wordsworth, "Floating Island at Hawkshead: An Incident in the Schemes of Nature," 1820,

*Once did I see a slip of earth
By throbbing waves long undermined,
Loosed from its hold -- how no one knew,
But all might see it float, obedient to the wind;*

*Might see it from the verdant shore
Dissevered float upon the lake,
Float with its crest of trees adorned
On which the warbling birds their pastime take*

Wordsworth predicts that this island,

A peopled world ... in size a tiny room,

is fated to become

*Buried beneath the glittering Lake!
Its place no longer found*

Chapter 14 -- Rhyme

James Montgomery, "The Pelican Island," 1828,

*The livelier inmates to the surface sprang,
To taste the freshness of heaven's breath, and feel
That light is pleasant, and the sunbeam warm.
Most in the middle region sought their prey,
Safety, or pastime; solitary some,
And some in pairs affectionately join'd;
Others in shoals immense, like FLOATING ISLANDS,
Led by mysterious instinct through that waste
And trackless region, though on every side Assaulted by voracious enemies,
-- Whales, sharks, and monsters, arm'd in front or jaw,
With swords, saws, spiral horns, or hooked fangs.
While ravening Death of slaughter ne'er grew weary Life multiplied the immortal meal as fast.*

Pierre Jean de Béranger, "Summer Rain," Atheneum, March 1829,

*Whirling amain on that wild flood,
Some oarless insects sweep,
Perched on a larger insect's wing,
A wreck upon the deep;
Or, clinging to some FLOATING ISLE, --
A witner'd leaf, -- they deem
Their troubles light, if, pendant o'er
The brink of that rude stream,
A straw's majestic point appear,
To stop them in their dread career.*

Matthew Arnold, "The Strayed Reveller," 1849,

*They see the Indian
Drifting, knife in hand,
His frail boat moor'd to
A FLOATING ISLE thick-matted
With large-leaved, low-creeping melon-plants,
And the dark cucumber.
He reaps, and stows them,
Drifting--drifting;--round him,
Round his green harvest-plot,
Flow the cool lake-waves,
The mountains ring them.*

Alice Cary, "Visions of the Future -- The Winter Fireside," Ladies' Repository 13:12, December 1853;

*When a vision of the future,
As some far-off sunny ISLE,
DRIFTING shoreward on the ocean,
Lingers for a little while,
Then floats backward to its station,
In the future's pathless sea,
We regard it as but dream-life
Fancy that shall never be.*

Martin Tupper, "Of To-Morrow," 1853,

*There is a FLOATING ISLAND, forward, on the stream of time,
Buoyant with fermenting air, and borne along the rapids ;
And on that island is a siren, singing sweetly as she goeth,
Her eyes are bright with invitation, and allurements lurketh in her cheeks;
Many lovers vainly pursuing, follow her beckoning linger,
Many lovers seek her still, even to the cataract of death.
To-morrow is that island, a vain and foolish heritage.
And, laughing with seductive lips, Decision hideth there.
Often, the precious present is wasted in visions of the future,
And coy To-morrow cometh not with prophecies fulfilled.*

"A Prayer for Life," Atlantic Monthly, April 1859

*Self-crushing and self-fettering; gleams are caught
From some far centre set by God to keep
His brave world spinning, or some DRIFTING ISLE
Of swift wildfire shot out by the wide sweep*

Lord Houghton, "Delos," Poems of Places: Greece and Turkey in Europe (1878), edited by Henry Wadsworth Longfellow

*I knew that on the spot I trod
Her glorious twins Latona bore,
That for her sake the pitying
God Had fixed the ISLE AFLOAT before;
And, fearful of his just disdain,
I almost felt it move again.*

Robert Barbour, "Let There Be Rest." Jeroveam's Wife, and Other Poems (1879),

*Sabbath is coming in, and I have rest from sin;
The week's repeated weariness is past.
This hath no brother-day to press on it and say:
O like all else that hath been, wilt thou last?*

*Each Sabbath stands alone, a separate work in stone,
Firm 'mid the vast vicissitude of days,
Fair FLOATING ISLE of time, anchored in other clime,
Fixed, fascinate by the Eternal's gaze.*

"K.C.," "Emigrants," Dublin University Magazine, November 1879,

*Silver and gold, silver and gold, --
For the moon in the east is a queen to behold,
As she reigns with her spells o'er the calm sweet night,
Holding tremulous scepter where ghosts walk white.*

*Silver new-molten meets ebbing of gold,
On a WANDERING ISLE without a foothold,
A vessel alone on the lonely seas,
Stirred with the sigh of the fanciful breeze.*

Jeannette Clark, "The Dying Girl," Nettie's Poems : and a Farce, Old Fogy and Young America (1880),

*Only an ISLE AFLOAT from heaven,
By old time storms and tempests riven;
Only an isle cast off by God;
His presence breathes in every sod.
There is no power that e'er can sever
The links that bind us there forever.*

Mathilde Blind, The Ascent of Man (1888), the theory of evolution as an epic poem,

*Bid Delos stand — that WANDERING ISLE of Ocean —
Stand motionless upon the moving foam,
To be the exile's wave-encircled home,
And lull her pains with leaves in drowsy motion,
Where the soft-boughed olive sighing
Bends above the woman lying
And in spasms of anguish crying,*

William Wordsworth, "The Prelude," 1888. After the exhilaration of Wordsworth's first few weeks at Cambridge subsided, the feeling of disorientation remained. To be unsettled is to be detached from a sense of place and purpose.

*To a FLOATING ISLAND, an amphibious spot
Unsound, of spongy texture, yet withal
Not wanting a fair face of water weeds
And pleasant flowers.*

The Norton editors informs us that this "floating island" refers to the "considerable tract of spongy ground covered with aquatic plants" which, according to Wordsworth's Guide to the Lakes (1810), occasionally appears on the Derwentwater (Chapter 48). To Adam Potkay, however, per "A Satire on Myself: Wordsworth and the Infant Prodigy," Nineteenth-Century Literature 49:2, September 1994, the allusion recalls as well the floating island of Swift's Laputa (Chapter 81), where solipsistic philosophers dwell with "one of their eyes turned inward, and the other directly up to the zenith."

It is said that one family escaped the wreck of the mythic Atlantis and became rulers of the fragment that remained as an island floating in the tropic seas.

Chapter 14 -- Rhyme

In Mary Toland's Atlina: Queen of the Floating Isle (1893) the heiress to the throne of the far-away isle is wooed and won by Diotheus, who takes her back to Greece as his queen.

*No fairer mortal maiden ere was seen,
Her charms of manner bore a winsome way.
Crowned was she on the FLOATING ISLE as queen
O'er sea and land in glorious array.*

*Her palace pearled with golden settings rare,
Its temples blending treasures of all climes.
Her bowers were draped with climbing flowers fair
O'er gleaming domes that measured music's chimes.*

*Her Nereid attendants served with love;
They hovered near the FLOATING ISLE with pride
On dolphins, their devotion thus to prove.
Played timbrels, dancing on the rippling tide;*

*Her parents in their temple offered praise,
Gave thanks to Zeus with offerings and prayer;
They taught Atlina's life pure, holy ways
To thus repay the gods for guardian care.*

*Thus glided they o'er ocean's throbbing breast,
The groom and bride guarded from every ill.
When FLOATING ISLE receded on the west,
Atlina's heart was pained with saddened thrill;*

*The day was blushing, as approaching night
Unfurled its glowing colors in the west,
When lo! a mirage, framed with ruby light,
Of FLOATING ISLE in tropic beauties dressed*

*Above the low horizon lifted there,
With halos, lingering rays of setting sun:
Its sacred temples pictured in air
That mystic hour when day its course hath run,*

*"See!" cried Diotheus, "my dreams unfold;
This scene the gods predicted unto me.
Thou shalt Atlina's FLOATING ISLE behold
Uplifted to the skies, 'tis God's decree."*

Lida Keck, A Silvern Secret: Or, The Autobiography of a Silver Dollar (1894),

*Our vessel is a FLOATING ISLE
By steam's enchantress moved along,
A world sufficient in itself,
Unfettered, buoyant, brave and strong.*



Chapter 14 -- Rhyme

Mildred Sweeney, "In Delos -- In the DRIFTING ISLE," Poet Lore, a Magazine of Letters 21 (1910),

*It was within the narrow isle --
The isle long since that drifting tried
The southmost sea -- where not a field
Could wish to be more wide,
When that its straight bound so might yield
A charm the princelier lands have not revealed --
This view so fair upon the far-off blowing tide.*

Henry Dumont, "A Golden Fancy," A Golden Fancy: And Other Poems (1910)

*The oppressive darkness gradually dissolved,
And left in the wide vault a clearer space
For aching sight. And I beheld a star,
A lonely star, afar in deeps of blue,
An opal ISLE AFLOAT in airy seas,
Wherein no mariner had ever dipt
An oar, save those propelling wondrously
My bird-like barque, all noiseless at the prow
And with no wake, the while the island grew
Upon the sight, a glory seen through tears.*

Walt Mason, "Her Busy Day," 1914, in its entirety.

*The British matron used to sit in gracious dignity, and knit, and patch her husband's duds;
With earnest zeal she used to make the bread, the doughnuts and the cake, and boil the
luscious spuds.
But times have changed; now, fiery-eyed, she lets her household duties slide, and treads her
martial path;
And in that land of good roast beef, the men are full of fear and grief, and shaken by her wrath.
She says that she will have the vote, if she must set the ISLE AFLOAT, to drift to Kingdom
Come;
She burns cathedral, hall and school, and in her dainty reticule, she packs a deadly bomb.
She pokes her one price parasol through costly paintings on the wall of this or that musee;
She chases statesmen here and there, until they plunge, in their despair, into the sobbing sea.
The king's afraid to take a walk, let some bold matron's club may knock his crown across the
street;
He shivers on his royal throne, and in her bower, depressed, done, Queen Mary has cold feet.
The judges send the girls to jail, and take in fines, their modest kale, but little does it help;
From Lunnon Town to John O'Groat's, the women, for their precious votes, kyoodle, shriek and
yelp.
So let us glad and thankful be that in this country of the free, the women are more wise;
In gentlemanly style they fight, that they may gain their sacredright, the ballot, bless their eyes!*

C.S. Lewis, "Song of the Pilgrims," Spirits in Bondage (1919),

*So long we have been wandering all this while
By many a perilous sea and DRIFTING ISLE,
We scarce shall dare to look thereon and smile.*

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Marina Tsvetaeva, "An Attempt at Jealousy," 1924,

*How is your life with that other one?
Simpler, is it? A stroke of the oars
and a long coastline—
and the memory of me*

*is soon a DRIFTING ISLAND
(not in the ocean -- in the sky!)
Souls -- you will be sisters --
sisters, not lovers.*

A.R.D. Fairburn, "The Cave," 194),

*We climbed down, and crossed over the sand,
and there were ISLANDS FLOATING in the wind-whipped blue,
and clouds and islands trembling in your eyes,
and every footstep and every glance
was a fatality felt and unspoken, our way
rigid and glorious as the sun's path,
unbroken as the genealogy of man.*

Archer Huntington, Recuerdos, January 1949,

*Poet,
Whose speech is but
A golden ISLE AFLOAT
Upon the seas of words,
Yet have you won
Heartfelt devotion's waves,
That join the rising chants,
And softly beat
Upon your shores of song,
Where floats your name:
Mistral! Mistral!*

Ruth Miller, "The FLOATING ISLAND," Floating Island: Poems (1965),

*Down the gluttoned river's throat
Jut the jagged trunks of trees,
Giddily the bubbles float;
The dead drowned buck have wounded knees.
The basket nests ooze mud in sodden trees.*

*Swirling in a giddy gyre
Down the brown Zambesi flood
Comes an island -- torn entire
With tendon reeds and brackish blood,
Pried from its moorings in the silent mud,
Their sucking hoofprints moon the mud with sound.*

*A nightfall on the Smoke that Thunders
Will spring to gulf their leaping sides.
Wrenched from our continent, we blunder
And lacking weather-sense for guide
Our green uncharted islands sink in raveled floods, blind-eyed.*

Chapter 14 -- Rhyme

Samuel Davies, "The Invisible World," Collected Poems of Samuel Davies: 1723-1761 (1968),

*Our Time is but a little FLOATING ISLE;
For wide Discoveries we look round and toil,
In vain; the Isle lies wrapt in thickest Glooms,
Where scarce a Gleam of shining Knowledge comes.*

David Rigsbee, "F-stop," Prairie Schooner 65:1, Spring 1991,

*My neighbor's horizontal back moves
beyond her shrubbery like a FLOATING ISLAND.
She's weeding the space in front of the bushes,
her eyes as flawless and dispassionate as a quality control expert.*

J.D. McClatchy, "An Essay On Friendship," Poetry, February (1990),

*Cheating on that regime of artificially
Sweetened, salt-free fictions the dangerous
Years concoct for nostalgia's FLOATING ISLAND.*

Marina Tsvetayeva, "An Attempt at Jealousy," Posle Rossii (1992),

*How's your life with the other one-
Easier?- A stroke of the oar!
Like the coastline
Does it take long for the memory to recede*

*Of me, a FLOATING ISLAND
(In the sky - not on the waters!)
Souls, souls! you should be sisters,
Never lovers - you!*

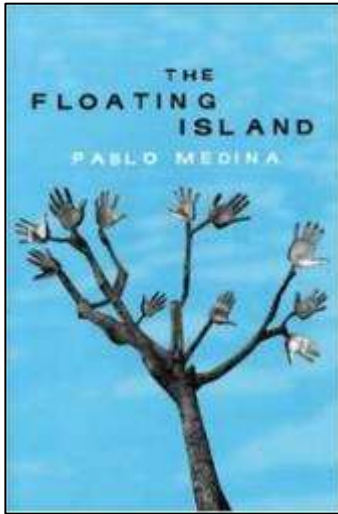
Ralph Allen, "Island," Tattoo: A Collection of Short Fiction & Poetry (2011),

*As a lad I walked the deck of a Shanghai merchantman,
A long glass in my hands midst the warmth of a summer sun,
There broad upon the bow, my soul leapt as I viewed the scene
Of a tranquil tropic ISLE AFLOAT on a sea of green.*

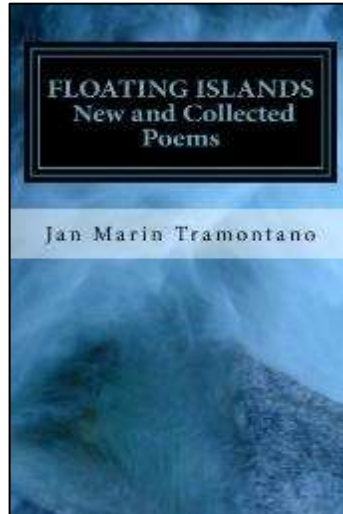
Taylor Mali, "Tony Steinberg: Brave Seventh-Grade Viking Warrior," What Teachers Make: In Praise of the Greatest Job in the World (2012),

*The Vikings often buried their bravest warriors in ships.
Or set them adrift and on fire, a FLOATING ISLAND of flames,
the soul of the brave warrior rising slowly with the smoke.
In order to understand life in Scandinavia in the Middle Ages,
you must understand the construction of the Viking ship.*

Poetry volumes



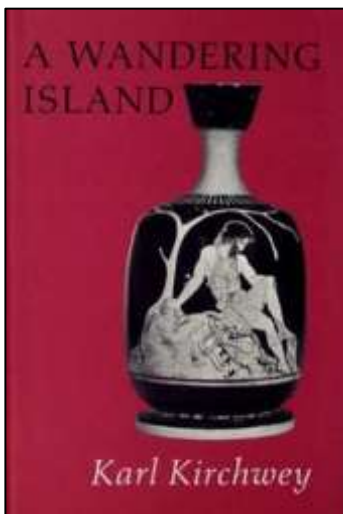
The Floating Island (1999) by Pablo Medina



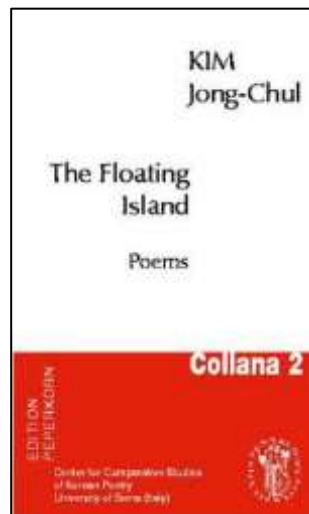
Floating Islands: New and Collected Poems (2005) by Jan Tramontano



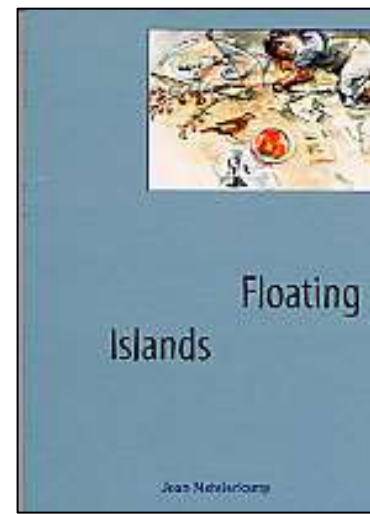
Floating Island Workshop (2010)



A Wandering Island (1990) by Karl Kirchwey



The Floating Island : Selected Poems 1968-1997 (1999) by Jong-Chul Kim,



Floating Islands (2001) by Joan Metelerkamp

And what would come of poetry if we ceased to analyze it? A few thoughts:

The Complete Dictionary of Arts and Sciences (1766)

[Allegorical poetry] gives great latitude to genius, and affords such a boundless scope for invention, that the poet is allowed to soar beyond all creation; to give life and action to virtues, vices, passions, diseases, and natural and moral qualities; to raise FLOATING ISLANDS, enchanted palaces, castles, &c. and to people them with the creatures of his own imagination.

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The Pleasing Companion, or, Guide to Fame in the Sciences of Logic.... Metaphysics... and the Art of Poetry (1798)

The poet, not satisfied with exploring all nature for subjects, wantons in the fields of fancy, and creates beings of his own. He raises FLOATING ISLANDS, dreary deserts, and enchanted castles, which he peoples by the magic of his imagination, with satyrs, nymphs, fairies and gnomes; and from imaginary things excites real pleasure, and furnishes the mind with solid instruction.

Michael Murphy, Poetry in Exile: A Study of the Poetry of W.H. Auden, Joseph Brodsky and George Szirtes (2004)

Like Ovid's *Epistulae ex Pontom* it also addressed "under Flying Seal" to an official audience back home. In doing so, Auden is implicitly commentating on the fact that poetry must in some essential way exist in a kind of no-man's land -- or FLOATING ISLAND -- between the public and private.

Agnes Lam, "Poetry in Hong Kong: The 1990s," World Literature Today 73:1, Winter 1999.

Louise Ho's poem "Island" captures the fluidity in identity as this deadline drew near. We are a FLOATING ISLAND. We have no site. Nowhere to land. No domicile come July this year, We may begin to hover in situ.

Our finding:

Those who write of floating islands can be critiqued in terms of floating islands. We think it may have something to do with fractals.

CHAPTER 15

MARK THE METAPHOR

A metaphor is a rhetorical device that transfers the sense or aspects of one word or phrase to another. An example from "Crumbs of Comfort, The New Squeal," Perry Herald, October 2, 1935,

Theoretically we may have been on good ground but practically we find ourselves on a FLOATING ISLAND. We have condemned things because they were a trifle old, only to find that we have embraced a gay, young flapper, so fickle that even dapper young chaps shun her.

We'll include metaphors akin to "floating island," e.g. "island adrift," the latter sometimes suggesting a state more perilous than simply "floating," For emphasis, we capitalize FLOATING ISLAND or its surrogate. It's not so in the original.

A simile, a type of metaphor, compares two different things by explicit use of "like" or "as." An example from "Capping Decades of Searching, Princeton Scientists Observe Elusive Particle That Is Its Own Antiparticle," News at Princeton, November 24, 2014.

To avoid vibration, the microscope is cooled close to absolute zero and is suspended like a FLOATING ISLAND in the floor above.

In this chapter we'll pursue how the "floating island" metaphor is employed. The contents of this chapter, however, are just the tip of the iceberg. a "floating island" metaphor in itself, per Chapter 60. This chapter will concentrate on meaning. Other chapters deal with common associations.

A "semi-metaphor" is a literary construction embracing both literal and symbolic interpretation. A "floating island" might describe a physical buoyant platform on a water surface -- the dictionary definition -- and at the same time allude to, say, disconnection with its chaotic environment, a metaphoric allusion.

If the object said to be a "floating island" is factually a physical land mass bobbing in the waves without implication of attributes beyond the immediately-observable, the usage is literal.

If the object said to be a "floating island" is not a physically-appreciable island-evoking object upon a water surface, the usage is pure metaphor.

If the object said to be a "floating island" is indeed a physical body riding on water, but at the same time, the author is striving to convey a subjective characteristic, the usage is semi-metaphoric.

Consider the raft on which Huck and Jim hope to escape oppression in Mark Twain's Huckleberry Finn.

The "floating island" in "Huckleberry Finn Meets an Octopus on the Floating Island," Supersnipe Comics 3 (1946) is not a metaphor; it's a floating platform menaced by a cephalopod mollusk, an encounter that most surely would have displeased Mark Twain.

The raft in Twain's original work, however, is significantly metaphoric, at least according to those who critique such things.

The Fatal Environment: The Myth of the Frontier in the Age of Industrialization, 1800-1890 (1985), by Richard Slotkin,

The raft is another kind of refuge, a FLOATING ISLAND on which happiness and true speech are possible -- but it too is doomed by the flow of river and time which carry it deeper into the slave region.

The Anatomy of Story: 22 Steps to Becoming a Master Storyteller (2008), by John Truby,

The difficulty of creating an organic plot using the journey is clearly seen in Mark Twain's Adventures of Huckleberry Film. Twain comes up with the brilliant idea of the raft, a miniature FLOATING ISLAND, on which he can place Huck and a second character, Jim. But the vehicle is too small.



"The Two Providences: Thematic Form in 'Huckleberry Finn'", College English, January 1950, by Edgar Branch,

The friendly woods eventually fail as a hideout, but the flowing river offers greater security. Usually it breathes freedom and peace or, at dawn, "solid lonesomeness," an ideal place for sensuous bathing, "lazing," or drifting. Its symbolism encompasses that of the raft, a FLOATING ISLAND of security, where Huck could feel "mighty free and easy and comfortable," for "there warn't no home like a raft."

Huck Finn (2009), by Harold Bloom,

Thieves and murderers seek the same avenue of escape which Huck and Jim follow in domestic peace, and at last, in the persons of the Duke and Dauphin, the evil of river life invades the raft itself. The FLOATING ISLAND paradise becomes an occupied country, a place where absurd and sodden scoundrels hatch deceit and seek to avoid retribution.

The raft is semi-metaphoric, explicitly a platform drifting downriver, but at the same time, social commentary, far broader than that of a particular journey.

In the examples to follow, we'll not rule as to where a particular "floating island" falls on the "semi" continuum, but we'll recognize cases of both literal and metamorphic meaning.

"In Praise of Utopian Socialism in America," Alternative Futures: The Journal of Utopian Studies, Winter 1980, Spencer Olin and Nathaniel Bliss,

On their FLOATING ISLAND, Huck and Jim enjoy a life that typifies, with remarkable completeness, that ancient and enduring dream of natural felicity. The absence of social constraint; the recovery of an easy, flowing tempo of life; the pleasures

Let us begin with an advertisement for a classroom reading program.

Reading Eggspress is designed to build reading and comprehension skills, for students in years 3-8 (7-13 year olds). Using a highly engaging, floating island metaphor, this spinning world gets students involved and excited as soon as they enter.

But what is it, we might ask the reading specialists, that makes the metaphor engaging? Because it can be rendered in cartoon form?

Indeed Not. A floating island is an engaging metaphor for attributes a good bit more substantial.



Our broad venture into the world of floating islands is in substantial part a tour of metaphor. In this chapter we'll group a few, leaving other chapters to delve more deeply into particular manifestations. For example,

Chapter 5	Native American images
Chapters 6-8	Sea creatures
Chapter 14	Poetry
Chapter 47	Great ships
Chapter 60	Icebergs

Amidst the Rocks

A rock, formidable and immovable, provides contrast to the vulnerability and vagrancy of a floating island.

Charles Rist, Essais Sur Quelques Problemes Economiques et Monetaires (1933),

France finds herself on an isolated rock, lashed by the waves, but the other countries are on FLOATING ISLANDS. In the tempest, a rock, even isolated, is preferable to a FLOATING ISLAND.

Abbott Martin, "Dark Inscrutable Workmanship: Poetry for Grown People," Sewanee Review, July-September 1942,

Our life was like a FLOATING ISLAND, not the secure rock of self-awareness.

John Morrison, "The Oxford Movement and the British Periodicals," Catholic Historical Review, July 1959,

The via media, it said, became nothing but a FLOATING ISLAND between the solid rocks of Catholicism and Protestantism. When the seas were troubled, men would desert the island for the safety of the rocks.

Stephanos Stephanides and Susan Bassnett, "Islands, Literature, and Cultural Translatability," Poetry and Insularity (2008), perhaps a bit much for those of us not poets,

The bottom of the FLOATING ISLAND is always under threat of penetration from the phallic rocks, towers, pillars and spires of the ruled continent below, and the somatic pull of the continent attracts the court ladies who are drawn sexually by the earthliness of the footment and frequently venture off and away from the cerebral insularity of the FLOATING ISLAND above.

Awe

Arthur Stringer, The Dark Wing (1939),

It made Laurinda think of one of her lake swans, heavy-footed on land but a FLOATING ISLAND of beauty when back in its own element.

"Jewels of Manhattan," Buffalo Courier Express, January 30, 1949,

New York's financial district take on aura of a FLOATING ISLAND of light jewels.

Robert Lamberton, Plutarch (2001),

After a blow on the head, what he sees when he looks up... is a sea with FLOATING ISLANDS of light. Eddies and currents convey the planets against the background of the fixed stars, with abysses of blue-black and broad paths of white shoals. This spectacle tills him with joy, but when he looks down, vertigo mixed with fear and trembling.

Lesley Choyce, Sea of Tranquility: A Novel (2003),

Heaven would also have to be an island. An ISLAND ADRIFT in an endless sea, a sea with dark, glistening whales all around.

Betterment

According to Sonnik to A do Yak (Dream from A to Z, 2010) by Vladimir Melnikov, a floating island signals change for the better.



Contradiction and Contrast

George Horton, Like Another Helen (1901),

If there is any horror in a Cretan girl's mind equal to that of dishonor it is the horror of leprosy -- that hideous sore on the body of the loveliest siren ISLE THAT FLOATS in any sea.

Michael Harkin, "The FLOATING ISLAND: Anachronism and Paradox in the Lost Colony," in Small Worlds: Method, Meaning, and Narrative in Microhistory (2008), edited by James Brooks, Christopher DeCorse and John Walton. Harkin explores how large lessons are discovered in small worlds, the search for significance in the microcosm. Historical interpretation should move freely across disciplines, being held up to the present. Individual lives should be understood as the intersection of biography and history. To illustrate this, Harkin draws Virginia's lost colony of Roanoke, a "FLOATING ISLAND" of seemingly-contradictory interpretations.

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Ian Biddle, Music, Masculinity and the Claims of History: The Austro-German Tradition from Hegel to Freud (2011),

This image is compounded by another textual figure which, perhaps more than the others, fundamentally problematizes the subject location of the listener: the merry green ISLAND THAT FLOATS on the "dark unfathomable ocean" is a perplexing elaboration of the 'brief joy' image. We hover above the island, perhaps, but where, exactly, are we?

Delight

Louisa May Alcott, "A Jolly Fourth," Jimmy's Cruise in the Pinafore (1879),

First, a boat so covered with green boughs and twinkling yellow sparks that it looked like a FLOATING ISLAND by starlight or a cage of singing-birds, for music came from within and fresh voices, led by Annie, sang sweetly as it sailed along.

Robert Penn Warren, All the King's Men (1946),

That summer we had been absolutely alone, together, even when people were around, the only inhabitants of the kind of FLOATING ISLAND or magic carpet which being in love is.

"Mud-Luscious March," Amsterdam Daily Democrat and Recorder, March 25, 1980,

Is there any sensation more thrilling than the underfoot sliding of a March meadow, which all winter has been frozen rigid, which in another month will be riveted by millions of grass roots, but for this first month of spring is like a vast FLOATING ISLAND on a tea of anticipation

Elusivity

Richard Flecknoe, A Relation of Ten Years in Europe, Asia, Africa, and America (1655), regarding the quixotic quest for democracy,

Just like your FLOATING ISLANDS, slips away from you, when you think to set foot on it, and so eludes your imaginary possession.

Owen Felltham, Resolves, Divine, Moral, and Political (1806),

Like a FLOATING ISLAND, when we come next day to seek it, it is carried from the place we left it in, and, instead of earth to build upon, we find nothing but inconstant and deceiving waves.

Jaimie Hays, Floating Islands, An Exploration of Cultural Identity and the "Tyranny of the Mean" in Three Food Memoirs (2009),

Abu-Jaber's The Language of Baklava, the writers become "FLOATING ISLANDS," adrift in a sea of uncertain identity.

Her reflection seems to indicate that children are fluid, FLOATING ISLANDS, little cups that are filled to overflow when encountered with the conflict of duality between two identities

Flimsiness, Insubstantivity

Review of Mississippian Scenery: A Poem Descriptive of the Interior of North America (1819) by Charles Mead, North-American Review and Miscellaneous Journal 10:26, January 1820, makes use of the dessert allusion.

The fancier of poesy is no longer obliged, as in the first age, to busy his mind with a thousand indigestible matter-of-fact topics; nor is he, who deals in the substance of literature, teased with picking it out of the whipped syllabub and FLOATING ISLAND, the trifle and the flummery of the muses.

"Worthy of Imitation," Christian Watchman and Reflector, September 1, 1853,

In this age of "light reading," when a very large proportion of those young persons who read at all, the weightiest intellectual problem that is sought after or relished is what bears a strong analogy to a "FLOATING ISLAND," it is exceedingly gratified to be informed of the steps recently taken by the Boston Young Men's Christian Association.

F.W.H. Meyers, "The Subliminal Consciousness," Proceedings of the Society for Psychical Research 7 (1892),

Our supraliminal consciousness is but a FLOATING ISLAND upon the "abysmal deep" of the total individuality beneath it; and the waves which wash under one end of our narrow standing-place are continuous with the waves which wash under the other.

New York Evening Telegram July 15, 1895,

The preparations for the Corbett-Fitzsimmons battle are progressing briskly. Corbett is developing a rib-roaster that is to win the battle: Fitzsimmons dreamed that the battle took place on a FLOATING ISLAND in the river near Sioux City with Edward Lloyd as referee, and that he beat the champion in a punch. Corbett falling through a soft spot in the FLOATING ISLAND and being drowned.

Steven Oliver, "Unfreedoms of Expression," Antipodes, December, 2003, "Flatavia" being the modern world, static and devoid of historical sense.

It is common practice, and perhaps even common law among the poets of Flatavia - that omelette-shaped ISLAND ADRIFT in the Southern Ocean, to indulge in unabashed character assassination of the most clandestine kind (certainly the most cowardly and effective) namely, through the vigorous applications of boycott and general back-stabbing, and employ all manner of bile and meanness in an attempt to break the spirit of any "opponent" who shows the slightest inclination toward honesty and originality of expression.

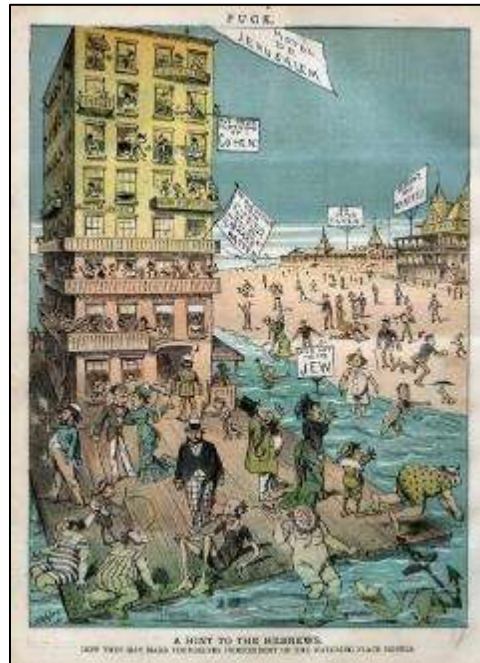
The Hebrews

The Wandering Jew, sometimes spoken of condemningly, sometimes sympathetically, dates to the 12th century. The Hebrew's plight is that of never assimilating, and thus ultimately being forced to move on.

To the right, an anti-Semitic "A Hint to the Hebrews. How they may have themselves independent of the watering place hotels," Puck, 1881..

John Simon, "Whose Paralysis is it, Anyway?" review of Arthur Miller's Broken Glass, New York Magazine, May 7, 1979, views the metaphor from within.

Miller is remasticating his perennial theme, sometimes disguised, sometimes flaunted: the Wandering Jew as a FLOATING ISLAND of raw sensibility in a sea of goyish uncaring, battered but uneroded by the billows of disparagement.



Illusion

Benjamin DeCosta. Footprints of Miles Standish (1864),

On the ocean phantom ships are seen crowding on sale for phantom ports, while in the distant bay are distorted spectral shapes that appear sufficiently grotesque for the wraith of the Mayflower, and we almost expect to see Miles Standish and his mail-clad retinue issue from out the neighboring woods. Frequently at times the earth seems to be nothing but a FLOATING ISLAND in a vast sea of shining haze -- an illusion which only a change of the wind can effectively dispel.

Alexander MacLaren, Expositions of Holy Scripture (1908),

We moor our ships to FLOATING ISLANDS which we resolve to think continents.

José Ortega y Gasset, "Taboo and Metaphor," The Dehumanization of Art and Ideas about the Novel (1925),

The metaphor alone furnishes an escape; between the real things, it lets emerge imaginary reefs, a crop of FLOATING ISLANDS. A strange thing, indeed, the existence in man of this mental activity which substitutes one thing for another -- from an urge not so much to get at the first as to get rid of the second.

P.A. Toivoriy, "Imaginary Reefs and FLOATING ISLANDS, The Romantic Image in New Zealand Painting," Ascent, A Journal of the Arts in New Zealand, July 1968,

This is not only a phrase poetically expressive of New Zealand topography, but also conveys, so aptly, those mirage-like images which the romantic soul conjures up to lend both his physical environment and his personality some, at least, contemporaneous significance.

I would like, therefore, to apply this notion of metaphor to painting in this country and to examine some of those manifestations, which, in general, are critically held to be satisfying images of our physical and spiritual being. By so doing, I can give no assurance that I will be able to provide any more sound critical ground than can be found on an imaginary reef or a FLOATING ISLAND.

In this, avowedly, romantic excursus, I have tried to steer as steady a course as one may between the realities. But as I suggested at the beginning, I am not sure whether I have found a secure critical anchorage, nevertheless I, for one, have been content enough to drift among these imaginary reefs and FLOATING ISLANDS.

Tom Cowley, Binghamton Press, December 2, 1969,

A fine fat old wives' tale about the Triple Cities is that there's an underground river running right clean through the whole place, sloshing and gurgling from east to west and we're all a shimmering FLOATING ISLAND of concrete and bricks.

Independence

Lowell Edmunds, "Necessity, Chance, and Freedom in the Early Atomists," Phoenix 26:4, Winter 1972,

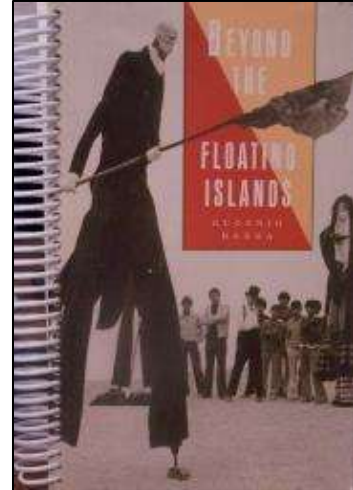
From the ethical point of view man seems to emerge as an island of freedom, a FLOATING ISLAND, perhaps in a sea of necessity.

Eugenio Barba, Beyond the Floating Islands (1978). From the author's "The House of My Origins and My Return," TDR, Spring 2004,

What can we do with theatre? My answer, translated into words, is: Make a FLOATING ISLAND, an island of freedom. This is derisory because the island is just a grain of sand in the whirl of History and does not change the world. Yet sacred, because it changes us.

From Barba's "Children of Silence: Reflections on Forty Years of Odin Teatret," TDR, Spring 2005,

Two extremes: the incursion into the machine of the body, and an opening for the irruption of an energy that shatters the limits of the body. Theatre can be the craft of incursion, a FLOATING ISLAND of dissidence, a clearing in the heart of the civilized world.



Colin Chambers, in "Third Theater," The Continuum Companion to Twentieth Century Theatre (2006) describes Barba's metaphor of the floating island as, "without contact among themselves but existing as an alternative to the two 'official' theaters."

Instability

House Armed Services Committee hearing concerning the U.S. military installation on the island of Guam, March 25, 2010,



Georgia Democrat Hank Johnson, after repeatedly asking about the island's size.

My fear is that the whole island will become so overly populated that it will tip over and capsizes.

The surprised Admiral Robert F. Willard, Commander of U.S. Pacific Command,

We don't anticipate that. The Guam population, I think, currently about 175,000, and again, with 8,000 marines and their families, it's an addition of about 25,000 more into the population.

A later clarification from Johnson's office:

I wasn't suggesting that the island of Guam would literally tip over. I was using a metaphor to say that with the addition of 8,000 Marines and their dependents -- an additional 80,000 people during peak construction to the port on the tiny island with a population of 180,000 -- could be a tipping point which would adversely affect the island's fragile ecosystem and over burden its already overstressed infrastructure.

Integration, Connectness

Frederic Hedge, "Conservatism and Reform, An Oration Pronounced Before the Peucinian Society, Bowdoin College," September 5, 1843

The aeronaut, who spurns the earth in his puffed balloon, is still indebted to it for his impetus and his wings: and still, with his utmost efforts, he cannot escape the sure attraction of the parent sphere. His FLOATING ISLAND is a part of her main. He revolves with her orbit, he is sped by her winds. We who stand below and watch his motions, know that he is one of us. He may dally with the clouds awhile, but his home is not there. Earth he is, and to earth he must return.

The most air-blown reformer cannot overcome the moral gravitation which connects him with his time

John Jones, "From Man to God," Saved by Hope (1911)

We look out upon the universe from our far little ISLE AFLOAT on vacancy, and we detect order, balance, system, adaptation, mathematics -- what looks like purpose in the vast fabric; there seems to be a mind -- somewhat akin to our own -- immanent in it. It is a spiritual universe.

Willard Waller, "A Deterministic View of Criminal Responsibility," Journal of the American Institute of Criminal Law and Criminology, May 1929,

Knowledge may thus be thought of as a FREE-FLOATING ISLAND of mutually conditioning facts and beliefs, of which each part supports and is in turn supported by all the rest, but whose totality is no more true than the totality of matter is heavy.

"The Big Days," Life, Jun 19, 1944, on D-Day,

Each boat fitted closely against the next, as if for security, so that in the mass they lost all identity and became a FLOATING ISLAND of men and metal.

Joseph Reimer, "A Week in the Lift of Cluster," Lawrence Kohlberg's Approach to Moral Education (1991), F. Clark Power, Ann Higgins, Lawrence Kohlberg,

When one man dies, a piece of the continent drops off. It is not just like some little ISLAND THAT DRIFTS away, it is a piece of the continent.

Isolation

In Constance Fenimore Woolson's Nineteenth Century: Essays (2001), however, Victoria Brehm looks to Woolson's metamorphic setting.

The hidden "castle" of the wilderness in Woolson's Castle Nowhere is indeed nowhere... [It is] a magical FLOATING ISLAND of sedge in Lake Michigan inhabited by a shipwrecker and his adopted daughter who has been protected from knowledge of the modern world.

José Ortega y Gasset, "Meditations on the Frame," Spectator, April 1921,

The work of art is like an imaginary FLOATING ISLAND, surrounded by reality on all sides. So it is decisive that it remains isolated from the life going on around it.

Ruth Seinfeld, "Jean Cocteau Penetrates the Dark World. His Enfants Terribles Play a Strange Game" review of Jean Cocteau's Infants Terribles (1929), New York Evening Post, June 7, 1930,

Paul and Elizabeth, orphaned brother and sister, live together in a room which is like a FLOATING ISLAND, a planet revolving in an orbit of its own, insulated against the adult world by the house of which it is physically apart.

Sigmund Freud, dying of cancer, letter to Arnold Zweig, March 1939,

I am a tiny ISLAND of pain FLOATING in a sea of indifference.

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Katherine Dunham referred to her dance troupe as a "FLOATING ISLAND of negritude." In the 1940s, the cast would arrive in American cities to find room reservations canceled because of their color.

Robert and Helen Merrell Lynd, Middletown in Transition: A Study in Cultural Conflicts (1940),

Each social science tends to be a FLOATING ISLAND of more or less internally coherent but partially unreal theoretical and factual certainties in the vast sea of living uncertainty. What we tend to teach our students is the limited cartography of our respective islands, paying scant attention to the mare incognitum of surrounding behavior.

Ayn Rand, The Fountainhead (1943) opens with focus on nature open to human effort and achievement.

The rocks went on into the depth, unchanged. They began and ended in the sky so that the world seemed suspended in space, an ISLAND FLOATING on nothing, anchored to the feet of the man on the cliff.

"We, the People," Utica Daily Press, February 2, 1952,

Mr. Hoover's speech calling for the withdrawal of American troops from Europe and a return to the "impregnable" Fortress America idea of the USA as a sort of FLOATING ISLAND in a Red Sea, did not raise my blood pressure.

Marilou Rudolph, "The Legend of Michael Rudolph," Georgia Historical Quarterly 45:4, December 1961,

The unanswered letter to Princess Eyié Bibisco (Madame Lemoine), natural heir of the Marshal, March, 1889, looks like a FLOATING ISLAND in the sea of Rudolph-Ney manuscript, with no connecting bridge of information

Cornelius Van Til, Christianity in Conflict (1962),

In the case of Kant, the application of the law of contradiction to the facts of space and time results in the reduction of the body of scientific knowledge to something that resembles a FLOATING ISLAND of ice on an infinitely deep and extended boiling cauldron of change.

Cornelius Van Til, Christian-Theistic Evidences (1978),

Kant's phenomenal realm is but an island, and that a FLOATING ISLAND on a bottomless and shoreless sea. After all, the human mind can furnish at most a finite schematism or a priori.

Modern science boldly asks for a criterion of meaning when one speaks to him of Christ. He assumes that he himself has a criterion, a principle of verification and of falsification, by which he can establish for himself a self-supporting ISLAND FLOATING on a shoreless sea.

Allen Shepherd, "Robert Penn Warren the Novelist, Now (and Then)," Southern Literary Journal, Spring 1980,

Tewksbury's promising career as a medievalist leads him to wonder whether he isn't hiding from present-day reality in the distant past, and the joys of married life transpire only on "our little FLOATING ISLAND," another intimation of self-induced isolation.

Morris Freedman, "Viewpoint: The Decline of the Faculty: Mandarins, Carpetbaggers and Zombies," Change, July-August 1980,

No professor can long survive as a FLOATING ISLAND, detached from the mainland of his colleagues.

Takuma Yasui, Modern Economics and I (1980), on the economy of modern Japan,

Modern economics was like a small FLOATING ISLAND in the sea of Marxism

"Letter from Quebec," Christian Science Monitor, November 28, 1988,

Immigrants keep a linguistic ISLAND AFLOAT. But some natives say newcomers threaten Francophone culture.

Jen Crawford, "Loving the Fake Air," Southerly 59:2, Winter 1999,

We are cold and warm in our coldness, holding fast to one another because we are alone, we are a proud DRIFTING ISLAND.

Stephen Olson, "Tools to Go Fishing," National Fisherman, June 1, 2005,

A fishing boat at sea is a FLOATING ISLAND, isolated from the rest of the world by a stretch of ocean. Sometimes it's just a mile or two of calm bay; other times the ocean is wide, and anything but calm. Either way, once a boat takes its departure from land and leaves behind the safety and protection of the shore, you're on your own.

"Macho Picho," Rambles and Ruminations, May 8, 2007,

Not quite jungle or rain forest and certainly not arid plain, Machu Picchu sits amongst several Andean peaks, like a FLOATING ISLAND.

John Steckley, Words of the Huron (2007),

This evocative image of Huronia as a "FLOATING ISLAND" is reproduced in a name for the Huron that appears in a number of seventeenth-century Jesuit dictionaries, both Huron (the first three entries) and Mohawk (the last two entries):

The words of the 1648 Relation might be instructive: the country "has now become a floating one." That is, it was not one before, but became one within recent times, this expression may have begun in the late 1640s with the defeat and destruction of village after village in Hurouia, or in the late 1630s, with the devastation caused by disease. The term may have lost its accuracy by the late seventeenth century, once the Huron settled at what is now their current home in Loretteville, Quebec.

Charon Austin, Tapping into my Soul (2008),

I want to capture the essence of myself in the hearts and souls of others through my talents, dreams, and aspirations. Yet, confusion takes me away again to its desolate ISLAND ADRIFT to hopelessness.

Diane Glancy, "M(other)" in Riding Shotgun: Women Write about Their Mothers (2008), Kathryn Kysar,

I made up words for the land I inhabited. I found it moved like a FLOATING ISLAND bumping against a continent that didn't want it bumping. I rowed my island back to the sea. Bypassing as it bypassed. What was it that was the connective? I was where I had to be when there was nowhere as yet to go. Going and ungoing.

Yi Mun-Yol, "An Anonymous Island," New Yorker, September 12, 2011,

In a village full of people who were so closely related, all tied to the same lineage, he was the sole DRIFTING ISLAND of anonymity.

Jill Schafer, review of I Am Anne Frank by Nautilus Music-Theater, Cherry and Spoon, January 12, 2013,

The set is like a FLOATING ISLAND in the beautiful cavernous space of the Southern Theater, a mostly bare square box with just the hint of a window and a desk and chair, and Anne's words on the back wall.

Perpetuity

Loren Weiner, "Infantile Mental Life and The Dream," American Psychoanalytic Association Conference, 2011,

It is as if the mental universe is a FLOATING ISLAND without beginning or end, as was once believed about the universe itself.

Power

"Pushkin," Slavonic Review 2:4, June 1923, D.S. Mirsky, on Russia in the 1830s,

It was, if you like, an artificial and unnatural civilisation. It floated on the surface of national life like a FLOATING ISLAND over the abysses of the ocean. Still, it found sufficient force in itself to coerce the unruly element under it, and not only to keep at bay its highly civilised and organised enemies abroad, but even to be aggressive

Prostitution

Clara Tuite, Romantic Austen: Sexual Politics and the Literary Canon (2002).

[Edmund Burke's version of the legend of Delos] *explains the pervasive metonymic relation between woman and island in western culture, as, for example, in the FLOATING ISLAND as a classical metaphor of female prostitution, taken up in Jonathan Swift's Laputa.*

Rootlessness

Henry Gardiner, The Anglo-American, or, Memoirs of Capt. Henry Gardiner (1813),

The sea was driving over us in a most awful manner; I immediately resumed the command. and was obeyed, as if by universal consent. The masts were instantly cut away, in order to let the vessel drive further up the reef from the destructive waves, but by this time the bottom was beat in, the sides parted from the deck, and we were left as upon a FLOATING ISLAND, driving to and fro.

Florence Caddy, Through the Fields with Linnaeus (1887),

He compared himself to the FLOATING ISLANDS of the Swedish lakes. His pretensions were backed by neither university, as he was not attached solidly to either of them.

Meredith Townsend, "Will England Retain India?" Eclectic Magazine of Foreign Literature, August 1888

The Indian Empire is not a miracle in the rhetorician's sense, but in the theologian's sense. It is a thing which exists and is alive, but cannot be accounted for by any process of reasoning founded on experience. It is a miracle as a FLOATING ISLAND of granite would be a miracle, or a bird of brass which flew and sung and lived on in mid-air. It is a structure built on nothing, without foundations, without buttresses, held in its place by some force the origin of which is undiscoverable and the nature of which has never been explained.

"Modern Music Is Subject of Carl Whitmer," Saratogian. April 28, 1926, provides not only a metaphor for a disjointed collection of musical effects, but also a witty culinary allusion to the topic of Chapter 84.

"Isle of Shadows" was a FLOATING ISLAND of bits of whole-tone scales and other modernist paraphernalia on a custard basis.

"Cafe Life in New York," New York Sun, January 2, 1947,

The Zanzibar is moving! Yes, it's a FLOATING ISLAND now; time, tide and trend have loosened its moorings at 49th street and Broadway and are slowly wafting it down the Main Stem to a new anchorage across the way at 1580 Broadway, a location just opposite the Strand Theater.

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Dwight Eisenhower, letter to Averill Harriman (son of E.H., Chapter 33), Administrator of the Marshall Plan, March 14, 1951,

Dear Averill

Won't you please tell the President that I most deeply appreciate the letter he wrote to me from Key West. I am especially glad that he so clearly understands some of the oddities of the position I now occupy...

One of the most noticeable characteristics of this headquarters is that it is sort of a "FLOATING ISLAND," not firmly attached to anything by traditional chains of responsibility, authority, and interest.

Roberto Gonzalez Echevarria's interpretation of Guillermo Cabrera Infante's Meta-Final, in The Voice of the Masters, Writing and Authority in Modern Latin American Literature (1985),

A kind of Orphic voice issuing from the earth [who] does not return to earth, but floats forever on the sea, a FLOATING ISLAND, a floating signifier, unmoored by referentiality and all cultural codes.

James Richardson, Vectors: Aphorisms & Ten-Second Essays (2001),

There is no virgin past. The mind is like one of those FLOATING ISLANDS of vegetation whose roots grasp not the earth but each other.

D. Max Moerman, "Demonology and Eroticism: Islands of Women in the Japanese Buddhist Imagination," Japanese Journal of Religious Studies, 2009,

Rasetsukoku represented a conflicted site of desire and denial, of anxiety and alterity: a realm where the boundaries of religion and sexuality were encountered and explored. It lay forever at the margins of the known world, marking the furthest edge of cultural identity. Yet, like a FLOATING ISLAND, it remained unfixed.

Myriam Chany, "FLOATING ISLANDS: Spectatorship and the Body Politic in the Traveling Subjectivities of John Edgar Wideman and Edwidge Danticat," Small Axe 15:3 (2011),

A fortuitous and certainly unplanned line break in the setting of the text in the original hardcover edition offsets the second half of "Rhode Island," with the last phrase, "History is moving on." When one scans the line, it reads: "Island. History is moving on." Indeed, the islands are not tethered, and we would do well to reflect on the Caribbean space as a complex negotiation of colonial/postcolonial realities.

Amy Wilentz and Jonathan Katz, "Nine Years in One Day: On Haiti," Nation, February 4, 2013,

With the rest of our fellow travelers, we inhabit a sort of floating ISLAND THAT DRIFTS over Haiti and the Haitian diaspora, never quite finding a permanent mooring.

Margarita Engle, "Quebrado," Hurricane Dancers: The First Caribbean Pirate Shipwreck (2014),

*I think of myself
as a place -- a strange place
dreamed by the sea,
belonging nowhere,
half FLOATING ISLAND
and half
wandering wind.*

Margarita Engle, "Quebradom," Hurricane Dancers: The First Caribbean Pirate Shipwreck (2015),

I still think of myself as a broken place, a DRIFTING ISLE with no home.

Security

New York Evening Telegram, February 25, 1904.

Young grebes take to the water a couple of hours after being hatched, and they take their future home with them. It is the back of the mother, a veritable FLOATING ISLAND!



Sara Waldorf, "The Milk of Human Kindness," Hudson Review 60:1, Spring 2007,

Now they could go home. They had done their duty for the day, Eleanor thought. She would take a bath first thing and lounge in the water in a decadent manner, be a FLOATING ISLAND in a bottomless pond.

David Ross, Calico Pennants: A Novel (2009),

Not long ago this pretty little ISLE, DRIFTING at the outskirts of forever, had offered security from a very different kind of storm..

Sluggishness

Kon-Tiki Museum, Oslo,

The raft did not move fast, they managed an average speed of barely two knots. More like a FLOATING ISLAND than a seagoing craft, it lay pitching in the swell. Seaweed and shellfish grew on the balsa logs and attracted all sorts of fish: sardines, tuna and dolphins, not to mention sharks and snorting whales.

Transiency, Inconsistency

Thomas Ford, "The Subliminal Consciousness," The Times Anatomized in Several Characters (1647),

An inconstant man is a wandering star, never fixed in any resolution. Whatsoever he meant or said is presently altered, for he meant it not long enough to take impression. All his purposes are built upon the FLOATING ISLAND of his several humors.

Thomas Fuller, The Holy State (1648), literal in reference to Loch Lomond, metaphoric regarding intransigency.

They tell us of a FLOATING ISLAND in Scotland, but sure no wise pilot will cast anchor there, lest the land swim away with the ship.

Jeremy Taylor, Doctor Dubitantium or The Rule of Conscience (1660) expresses some of the frustration which can be connected with arguing for one's point of view.

Because our reason does not consist in a mathematical point: and the heart of reason, that vital and most sensible part, in which only it can be conquered fairly, is an ambulatory essence. and not fixed; it wanders up and down like a FLOATING ISLAND.

William Temple, The Works... to which is Prefixed the Life and Character of Him Written by a Particular Friend (1750),

Our counsels and conduct were like those of a FLOATING ISLAND, driven one way or the other according to the winds and tides.

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Noah Webster, An Essay on the Necessity, Advantages, and Practicality of Reforming the Mode of Spelling and of Rendering the Orthography of Words Correspondent to Pronunciation, (1789),

As a friend of mine once observed, it is like fixing a light house on a FLOATING ISLAND. It is an attempt to fix that which is in itself variable, at least it must be variable so long as it is supposed that a local practice has no standard but a local practice; that is, no standard but itself.

"Causa Causans," Utica Weekly Herald, June 29, 1869,

It would be a mere will-o-the-wisp, leading into the quagmires and marshes of difficulty, and then suddenly disappearing -- a FLOATING ISLAND on the political ocean, here to-day, there tomorrow

Rev. Dr. Saxe, "Vanity of Vanities," Rochester Democrat Chronicle, February 27, 1888,

That hallowed world where we were cradled, with its witchery of romance, its thrilling memories, its griefs and joys, drifts like a FLOATING ISLAND off on the waste of unknown seas.

"Boston Hails the 7th. Crowds Everywhere to Admire the Visitors," New York Sun, May 31, 1897,

The police, unaware of just which way the march was to proceed, flew around as if distracted, hustling the people first this way and then that, and the crowd surged about in a great mass, as if it were a FLOATING ISLAND driven by some swirling currents.

"Gleanings," Portville Review, December 10, 1931,

The world is like a FLOATING ISLAND and as sure as we anchor to it, we shall be carried away by it.

Christine Gudorf, review of Blessing Same-Sex Unions: The Perils of Queer Romance and the Confusions of Christian Marriage by Mark D. Jordan, Journal of Law and Religion 21:2, 2005/2006,

Any new theology of marriage will be a kind of FLOATING ISLAND, subject to transformation from a huge variety of variables.

Mihaela Miroiu, "An Exotic Island: Feminist Philosophy in Romania," Signs, Winter 2009,

Feminist philosophy in Romania is not a successful public story but rather a FLOATING ISLAND, still in existence as a tool for applied analyses, drifting toward the friendlier continent of political science.

Waste

New York Evening Post, July 22, 1925,

The Anti-Trust Bureau for more than ten years has been an anomalous FLOATING ISLAND off there somewhere. Now, we want to cut out the inefficiency, slash all that red tape, speed matters up.

"Hoover Plans Prevention of Governmental Waste," Gloversville Morning Herald, August 24, 1928,

Mr. Hoover has found hundreds of instances of overlapping, of scattered functions, of "FLOATING ISLANDS in the dismal swamp of bad organization," as he neatly expresses it. Divided responsibility with-absence of central authority costs the taxpayers of the United States hundreds of thousands of dollars every year.

Adam Keleman, film review of "Astro Boy," Slant, October 21, 2009,

Metro City, the birthplace of Astro Boy and a fitting metaphor for man's wastefulness, is a FLOATING ISLAND of technological prosperity and efficiency, sitting high in the sky, dumping

discarded, damaged robots onto a polluted Earth's surface, which is also inhabited by countless orphaned and misplaced humans.

Henry James

Henry James, The Wings of the Dove (1902),

Nothing could have served more to launch them. on their small FLOATING ISLAND than such an assumption that they were only making believe everywhere else.

An oft-noted floating-island metaphor is from Henry James' The Ivory Tower (1917).

His "culture", his initiations of intelligence and experience, his possibilities of imagination, if one will, to say nothing of other things, make for me a sort of figure of a FLOATING ISLAND on which he drifts and bumps and coasts about, wanting to get alongside as much as possible, yet always with the gap of water, the little island fact, to be somehow bridged over.

The reviewers are not in agreement, however, as to the inference

Alwyn Berland, Culture and Conduct in the Novels of Henry James (1981),

James' metaphor of a "FLOATING ISLAND" has an interesting resemblance to the "golden Islands" of money and privilege to which Margaret Schlegel speaks of in E.M Forester's Howards End

Mark Seltzer, Henry James & the Art of Power (1984),

Gray is to be as "different as possible" from the inhabitants of the American world of ferocious acquisition; he is to be a sort of "FLOATING ISLAND" of "culture." And his "entire difference" is made possible by the real absence, or more precisely, what James calls the "real suppression for him of anything that shall count in the American air as a money making."

Daniel Hannah, "Massed Ambiguity: Fatness in Henry James's The Ivory Tower," Twentieth Century Literature, Winter 2007,

Gray's status as a "FLOATING ISLAND" -- a "little island" at that -- in the novel's figurative geography points to how his fate in America will be "circumferentially and surroundedly" inscribed by his placement against the "hovering and pressing" embodiments of wealth, leisure, and excess.

A strong metaphor, it seems, may elicit a spectrum of interpretations.

Inundation

When floodwaters isolate a refuge of land, description as a "floating island" is often forthcoming. "Island" is literal; "floating" isn't.

"Holland and its Dykes," The Friend, January 24, 1852,

The only relic preserved from the waters is a solitary tower called the House of Merwede. The country about Dort seems choked with water, or like a FLOATING ISLAND loaded down as deep as it can swim, and in danger of sinking.

"Flood Waters in Venice," Saratogian, November 7, 1966,

Gondolas are sunk near San Marco Square in Venice, Italy, with the rest of the city looking like a FLOATING ISLAND after days of torrential rain.

"Touring Nebraska's flooded nuke plants," KVNO News, June 27, 2011,

About two hours north of Cooper is Nebraska's second nuclear plant: Fort Calhoun. From the air, the plant looks like a FLOATING ISLAND in a sea of muddy water. Fort Calhoun is shut down. It went offline for refueling in April, and hasn't come back.



Moral Edification

Floating islands provide object lessons for those in the business of moral instruction.

"Married Life," Syracuse Daily Journal, June 15, 1920, on the writings of Thomas Fuller, an English moralist of the 17th century,

"Marriage, Olympus, wholly clear, without clouds. Yea, expect both wind and storm sometimes; which, when blown over, the air is clearer and wholesomer for it."

He advised against choosing wives for beauty alone, and, in this connection, told of a FLOATING ISLAND in Scotland that swam away with ships that were tied to it.

And he added: "So are they served, and justly so, who only fasten their love on fading beauty, and both fall together."

William De Britaine, Human Prudence; or, The Art by which a Man May Raise Himself and His Fortune to Grandeur (1726),

When a man is known to be false to his word, he is no other than the FLOATING ISLAND some historians mention, which is seen in the day, but when we come the next, is carried we know not whither, and instead of expected earth to build on, we find nothing but deceiving and unconstant waves.

Robert Goadby, Family Library 2 (1755),

Our Fortune and Condition in the World is naturally a fluctuating unstable Agitation, made up of a confus'd and motly Variety of Events; Knowledge and Virtue, fix the FLOATING ISLAND, and give Light and Beauty to the Chaos.

Ralph Erskine. "The Day of Effectual Calling, a Levelling Day, or, The Heights from Which Sinners Come Down in the Day of Effectual Vocation," Sermons and Other Practical Works (1796)

Some hold to the branch of worldly considerations, minding only earthly things, and cast anchor there, making earth their heaven, but this world is like a FLOATING ISLAND, such as some we read of, where it is folly for sailors to cast anchor, lest the land swim away with the ship. Oh, dangerous trusting to floating and flying things!

"Selfish vs. Unselfish Aims of Life," Phrenological Journal, May 1877,

Here is another whose aim in life presents a very different phase from the foregoing, and yet he is thoroughly selfish. You and I, reader, will compare him with one who constructs a beautiful island -- an ISLAND TO FLOAT UPON THE OCEAN, or some other body of water... A beautiful creation, truly, but we look upon the frail structure and shudder at the thought of its dangerous state, when far out in mid-ocean, where its floating treasures will be exposed to merciless

waves. We try to dissuade him from the perilous doom which we feel certain awaits him, but the warning does not avail.

For many days the sea is so smooth that he floats in perfect security... Enchantment has woven her tissues around him so completely that he does not see the leaden hue which bounds the waste of waters at the horizon. Soon the elements seem to have broken loose, the breeze rises to a gale, and the huge billows that roll against our ship make her tremble and groan fearfully. The storm is appalling while it lasts. When it has ceased, we look out upon the foam-capped waves whose angry roar seems yet a menace, and look in vain for the floating isle of beauty which we had followed. Ah! the ocean will keep its secret.

Perhaps, escaping the storm, he floats on in indolent ease; or, wrapped in his dreams of enchantment, unaware that he is approaching a maelstrom. We ride beyond the influence of the terrible danger, and with stricken hearts watch him go to his doom. He gradually, but surely, approaches with the circling waves until the velocity, the whirling of his FLOATING ISLAND, becomes fearful; then he is suddenly drawn into the vortex and is lost.

Owen Felltham, Resolves, Divine, Moral, and Political (1806),

When a man is known to be false in his word, instead of a column, which he might be by keeping it, for others to rest upon, he becomes a reed, which no man will vouchsafe to lean upon. Like a FLOATING ISLAND, when we come next day to seek it, it is carried from the place we left it in, and, instead of earth to build upon, we find nothing but inconstant and deceiving waves.

Jeremy Taylor and George Rust, "On the Right of Sure Conscience," The Whole Works of the Right Rev. Jeremy Taylor (1835),

Because our reason does not consist in a mathematical point, and the heart of reason, that vital and most sensible part, in which only it can be conquered fairly, is an ambulatory essence, and not fixed, it wanders up and down like a FLOATING ISLAND, or like that which we call the life blood.

Zerah Hawley, Congregationalism and Methodism, New York (1846),

As we indignantly shake every human yoke from our necks in civil matters, so we permit no man or body of men to "lord it" over us in religious matters.

But this feature of Congregationalism, so adapted, as it would seem to recommend itself to every man's reason and conscience, who is not filled with a "love of the pre-eminence," is often objected to, as leaving us upon a FLOATING ISLAND at the caprice of every wind and current of popular excitement and of popular error.

Stephen Tyng, The Rich Kinsman, The History of Ruth the Moabites. (c. 1855),

Your Christian character, your religious influence over others, and their confidence in the firm fidelity of your religious purposes, are all gone. Vain will be your effort to renew them, but in the sure and manifest renewal of your own Christian life. You will willingly anchor upon a FLOATING ISLAND? The fickle backslider can do no good, except as a warning monument to others. Your own free confidence in God as your heavenly Father, your filial, frank, and affectionate spirit in your relations to him, are gone. How painfully you feel this in your private attempts to pray! How often God seems to be far from you!

"The Bible; the Grand Revelation of the Mind of God." Jewish Herald, March 1853, British Society for the Propagation of the Gospel among the Jews

The eye, touched with the finger of God, sees the land afar off, to which this world, with all its glory and grandeur, is but a dimly lighted and slightly adorned vestibule; a FLOATING ISLAND, between the two streams of the past and the future, the temporary abode of each spirit, which

the voice of God summons into existence here, and bids it commence its career as a thinking, acting, and accountable creature, whose destiny it will take a whole eternity to develop.

"The One Thing Settled," Christian Advocate, June 26, 1873,

The credulity of a mind that can believe such a system as that of Christianity to have been a FLOATING ISLAND of falsehoods, consolidated into a continent of truth by Christ and his Apostles, is but itself all but a miracle of unreason

Charles Spurgeon, "What the Church Should Be," September 29, 1878,

The Church of God is not the quicksand of the Truth, but the pillar and pedestal of it—she is not the FLOATING ISLAND of the Truth, but the eternal column of it. The Church stands steadfast and unmovable as a pillar of Truth fixed on its base. If you find not the Truth of God anywhere else, you will find it in the Church of the living God, which is Truth's castle and stronghold.

Charles Spurgeon, The Treasury of David (1885)

The world is a FLOATING ISLAND, and so sure as we cast anchor upon it, we shall be carried away by it.

Lowell Edmunds, "Necessity, Chance, and Freedom in the Early Atomists," Phoenix, Winter 1972,

The note of moral exhortation suggests that man has a free choice between alternative ways of life, and thus that he is not in the grip of the original necessity which created the cosmos and him and endowed him with the arts. From the ethical point of view man seems to emerge as an island of freedom, a FLOATING ISLAND, perhaps, in a sea of necessity.

Richard Shriver, Gold to Refine (2005)

We thy children on this WANDERING ISLAND in the sky, a speck amidst the vasts of space, look up to thee. O God, let us not be confounded by the empty spaces or affrighted by world upon world unfathomable. As thou hast put us into a great universe, help us to see behind it and in it a great God.

The Dark Side

Floating islands likewise provide a point of comparison for those writing of subjects less uplifting.

Jeffrey Holmes, Farewell to Nova Scotia (1974). A miscalculated nuclear explosion separates Nova Scotia from the mainland, transforming the province into a FLOATING ISLAND which is torn by a farcical civil war between separatists, unionists, federalists, and other factions as it drifts towards the Caribbean.

Scott Beauchamp, 'A Weird Floating Island of Strange Death,' Full Stop, Reviews, Interviews, Features, May 17, 2011,

I have to say I don't know what I find more invigoratingly overwhelming: our power to create a weird, FLOATING ISLAND of strange death, or art so prescient that it displaces time, distorts causality, and convinces us for a moment that it has killed and buried coincidence.

"The Disposal of the Dead," Round the World in a Motor-Car (1909) Antonio Scarfoglio, on Bombay,

Already the burning which we witnessed is an immense improvement on the usual ghats to be seen in the poor quarters of many cities, where several bodies are piled on one fire, and only partially consumed, the remains being thrown into the rivers, there to form FLOATING ISLANDS of putrefaction, for the birds to light on whilst they plunge their beaks into the half roasted flesh.

Allegory

An allegory likewise shows how two different things are similar, but generally in the form of a longer piece. We'll note portions of two.

"Important New Discovery," Yankee Doodle, 1846-1847, chauvinism garbed as humor.

At a recent meeting of the New York Historical Society, a member arose, and, after stating that he had been on an exploring expedition into the heart of society, where he had discovered in the sea of fashionable dissipation, an island not set down on any of the maps, read a report embodying an account of his discoveries, from which we extract the following:

Coquette -- a FLOATING ISLAND which originally belonged to the groups of the Society Islands, but owing to the attraction exerted upon her by the Isle of Man, she abandoned her original position and gradually settled down among the Sicily Islands. Travelers sometimes wonder that this island and the Isle of Man have never been annexed to the United States; but a reference to the map will show that they are separated from each other by Cape Lookout on the one side and the Cape of Good Hope on the other. The appearance of the island is usually described as favorable. It presents a smiling surface to the eye, though much of this is the result of art -- is green at all seasons and frequently enlivened with a number of shallow streams, one of the shallowest being the stream of intellect.

James Henry, "The Drunken Sea. An Allegory," Catholic Advocate, January 30, 1847,

The longitude and latitude of Point Just-Enough never having been exactly ascertained, either from its being situated as already mentioned, in a FLOATING ISLAND, or whatever other cause, geographers have found it very difficult to assign the precise limits or Pleasant Bay. It is perhaps to get rid of that difficulty that some geographers describe Pleasant Bay as mending the whole of the way from Sober Island to Tipsey Island.

All voyagers to Point Just-Enough, agree in the account which they give of their passage across Pleasant Bay, and of the agreeable sensations experienced approaching the Point, but they disagree very much in their statements respecting the Point itself, some say it is further off, others say it is nearer, some say it lies more to the north, others, more to the east, many assert that it recedes as you approach it, while some affirm that it moves forward, and comes to meet you before you have more than half crossed Pleasant Bay.

These conflicting statements may, perhaps, be reconciled on the supposition, which seems far from reasonable, that Point Just Enough is situated in a FLOATING ISLAND, which, shifting its position from time to time, is sometimes nearer, sometimes more distant, sometimes a little more to the north and at other times a little more to the east. However this may be, the visitors to Point Just-Enough all agree in stating, that it is quite impossible to anchor off it, or to affect a landing upon it, the waters being so deep that no anchor will take up the ground, and the current so rapid as to carry you past the point, before you can secure the boat to it by any grapples which have yet been invented.

CHAPTER 16

PERMUTE

English is a synonymic tongue. "isle" more romantic than "island" "Drifting" conveying more sense of movement more than does "floating." "Adrift" hints of peril more than does "afloat."

Using "island" or "isle" as the noun, and a form of "float" or "drift" as the descriptor, "floating island" can be permuted numerous ways.

Floating island, Floating isle, Drifting island, Drifting isle.

Island afloat, Isle afloat, Island adrift, Isle adrift.

Island that floats, Isle that floats, Island that drifts, Isle that drifts.

Island floating..., Isle floating..., Island drifting..., Isle drifting..., where the ellipsis might represent an adverb, e.g. "lazily," or a prepositional phrase, e.g., "in the sea."

This chapter peruses the printed literature for such metaphors applied to nations, states and geographic regions. It's a full metaphor if the subject is not a land mass surrounded by water, e.g. "Washington is a floating island." It's a semi-metaphor if the "island" or "isle" factually is, e.g., "Britain is a floating island." We'll include both.

Restricting our bibliographic endeavor to geographic locations keeps our task manageable.

Floating Island

Britain's being a physical island encourages the "floating" metaphor to be repeatedly employed. We've many examples.

Britain -- M. Ferrand's speech to the 27th Synod of Alanson, 1637, Synodicon in Gallia Reformata, or the Acts, Decisions, Decrees and Canons of those Famous National Councils of the Reformed Churches in France (1692),

We cannot be ignorant, My Lord, that your eminency is that Intelligence who moves this admirable monarchy with the greatest regularity, that assistant spirit of this great body, which heretofore was like one of the FLOATING ISLANDS, but now your most admired conduct hath bound it so fast with the chains of the royal authority, that in the greatest and most astonishing tempests it abideth firm and immovable.

Britain -- Marchamont Nedham, A True State of the Case of the Commonwealth (1654),

When an establishment is once procured, after the many shakings and rents of civil divisions, and contesting! for liberty, as here now in England, doubtless we have the greater reason to value it, being purchased at the price of our blood, oat of the claws of tyranny; and we conceive it highly concerns us, to put in some sure proviso to prevent a razing of those foundations of freedom that have been but newly laid, especially in such an age as this, wherein men are very apt to be rooting and striking at fundamentals, and to be running out of one form into another ; and when it is found also, what advantages the common enemy hath made by our being in the condition of a FLOATING ISLAND , through neglect of any certain settlement.

Britain -- Major Wood, correspondence describing the discord of parties presaging approaching change, Privy Council Book, October 13, 1659,

The confusions now are so great that it is not to be credited; the chaos was a perfection in comparison of our order and government; the parties are like so many FLOATING ISLANDS, sometimes joining and appearing like a continent, when the next flood or ebb separates them that it can hardly be known where they will be next.

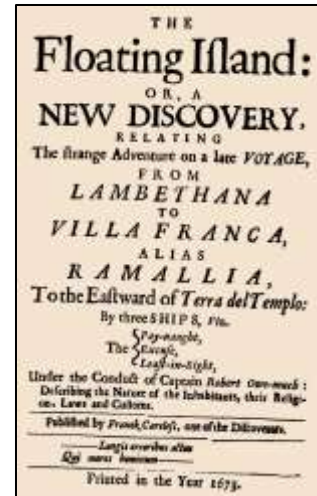
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Britain -- Peter Talbot, A Treatise of Religion and Government with Reflexions upon the Cause and Cure of England, Late Distempers and Present Dangers (1670),

Let us who .are but passengers and private persons in this great Ship of the Commonwealth pray for fair weather, that the Sun of Justice may shine, and discover the dangers both of soul and state, whereunto these our FLOATING ISLANDS have been driven by the tempestuous and cross winds of Protestancy, and leave the rest to God, and to such as he hath placed at the helm.

Britain -- The FLOATING ISLAND, or, A New Discovery Relating the Strange Adventure on a Late Voyage (1673), attributed to Richard Head, is a 17th-century counter-narrative of "discovery," portraying London as a floating island of low-life, taverns, prisons, and debauchery lying in the midst of Golpho de Thame-Isis. The Christian-shore lies to the north, the Turkish-shore, to the south, To the east is Pont-Troynovant. One may sail westward up the Straights as far as Maiden-head, and farther, crossing the Equinoctial-line.

In our circumferating this FLOATING SUMMER-ISLAND, we took special notice of its ingresses, but with our strictest indignation we could find but two, one lying to the Southward, and the other to the Westward, for the more convenient reception of the Christians and Barbarian Amazons, who in the Summer time constantly repair thither, to meet with their Bully-Huffs and Hectors withal.



Britain -- William Temple, "Of Popular Discontents," The Works of Sir William Temple, Bart: To which is Prefixed, the Life and Character of the Author (1814),

But such fatal effects of popular discontents, either past or to come, in this FLOATING ISLAND, will be a worthy subject of some better history than has been yet written of England.

Britain -- Review of Edward Freeman's The History of the Norman Conquest of England: its Causes and its Results (1870), Anthropological Review 8:28, January 1870,

Hence arose the fables of universal murder, and of nations utterly destroyed, which deserve the same amount of credit as the statement that Britain is a FLOATING ISLAND, appearing now in one part of the Atlantic, now in another.

Britain -- "Cecil Rhodes in Fiction," New York Herald, November 26, 1899,

He's not a man; he's a kind of FLOATING ISLAND, a movable England, the colonizing grabbing instinct made concrete.

Britain -- "He Thought England Was a FLOATING ISLAND and the Crazy Captain Sent His Ship upon the Rocks," Philadelphia Inquirer, March 24 1901,

In one of the insane asylums of England today is the captain of the ship Sillbridge, which went on a reef off the coast of Ireland a few months ago and sank with almost everyone on board. The captain was mad at the time his vessel went down and his officers and crew knew it, but such are the iron traditions of the sea that none dared dispute the orders that came from his disordered brain, but obeyed the command that sent the ship crashing on the rocks.

The Sillbridge was a fine, new staunch ship, homeward bound from South America. On a bright moonlight evening, in waters that are known to every mariner, and with the most favorable breeze, the Sillbridge struck. Only a few hours before, the first mate, realizing the captain's mental condition, and hoping to recall him to a sense of the danger he was inviting by the strange orders he was issuing, placed a chart before him and pointed out the vessel's position.

But the captain, with a maniac's laugh, pointed to the chart and said: "The secret of England's greatness is that she is a floating island and is continually shifting her position. Since we have been away, England has floated far to the southwest, and I have charted our course accordingly. I will waste no more time sailing around hunting England up. I have figured, up how fast she floats, and I know how to go direct to Liverpool."

He ordered his officers to their posts and crowded on all speed. The crew almost mutinied, but the officers calmed them by assurances that the captain was only joking, or, if ho were slightly out of his head, he would soon be all right again. The first mate debated with the second as to whether or not some restraint had not better be put on the captain's action. But the second mate had been too used all his life to implicitly regard the captain as absolute master on his own ship.

The first mate resolved when he took his watch on the bridge to bring the ship around on its course, but the captain, with the cunning of the insane, seemed to know that this might be attempted, and he refused to leave the bridge. He stood rubbing his hands and shouting: "England is a floating island, but they can't fool me. I know where she's moved to this time. Keep her helm hard down."

A half hour later and the ship struck, and men, women and children sank to rise no more.

Britain -- "Lobengula's Views. The Matabele Warrior, New in London, Says He's Happy," Rochester Democrat, July 31, 1899, on the former south African prince's reflection regarding the loss of his country to Great Britain,

If my father had known of the size of Great Queen's land, he would not have fought. He thought England a little FLOATING ISLAND.

Britain -- "MSS. of A.G. Finch, Esq., of Burnley-on-the-Hill, Rutland, Vol. II," Command Papers 8383 (1916),

England is a FLOATING ISLAND, or if you please a great ship tossed at sea; here Scylla, there Charybdis; here rocks, there quicksands. God I question not but will direct your Lordship under so great a Captain, our gracious Sovereign I mean, to a great means of fixing this FLOATING ISLAND and of guiding this ship menaced by rocks and sands on all sides into a safe port.

Manhattan -- April Bernard, "The Way We Live Now," Paris Review, Winter 1986

Manhattan, FLOATING ISLAND of currency, city of false economies.

Manhattan -- "Killing Them All," Colliers, October 22, 1921, a play by Frederick Palmer about defending New York City in a world of unlimited armament.

I'll set those artists to work on a new system of camouflage. I believe it can be done. I know it can be if we keep gloomy enough. Paint the skyscrapers of New York to look only two stories high, Trinity Church steeple to look like the dome of a mosque, the Public Library to look ten stories high, Central Park to look like a lake, run wavelike streaks all up and down all the buildings and across the streets -- and the enemy bombers will not know but Manhattan is a FLOATING ISLAND which may be at Atlantic City one day and at Newport the next. Two hundred million for that. What else?

Manhattan -- Italo Calvino's Invisible Cities (1974) conjures a metropolis made up of two half-cities -- one of carousels and circus tents, the other, of stone palaces, factories and monuments. A spiderweb of ropes and catwalks bridge the cap. In "Invisible Ciriwa," **Voices, the Journal of New York Folklore, Spring-Summer 2004**, Steve Zeitlin tells of assigning his creative writing students at Cooper Union to write a piece about New York inspired by Calvino's work.

Ellia Bisker's submission,

The city is a FLOATING ISLAND, secured with heavy anchors to its harbor. Every year the anchors are drawn up and the ships of the city throw iron chains to shore; then they steam out

with the city in tow... The city has lingered offshore of every country in the world, has spoken every language, eaten every food. It brings with it culture -- ballet, opera, graffiti, punk rock, stand up, obscure performance art. Brings dirty warehouse apartments, street fairs, stoop sales, bohemians, wherever it goes... No one ever knows where the city will go next, and so every misfit girl and boy in every backwater prays nightly that the city will come to them. When it does they jump aboard and leave with it, gypsy caravan city, circus train city, accruing new inhabitants as it travels.

As Long Islanders are prompt to clarify, they are not from New York City. "Floating island" is an apt semi-metaphor for an elongated body of land surrounded by water inhabited by a community wishing not to be in the shadow of skyscrapers. As with Britain, we've a number of examples.

Long Island -- "Cutchogue," Long Island Traveler, December 7, 1894, about a Long Island village,

Cutchogne makes no small a noise through the papers that one might almost conclude that it must be located on a FLOATING ISLAND and had drifted out so far to sea that it had lost all communication with the mainland. But that is far from being the case. We are very much like the rest of the world.

Long Island -- Frederic Simpich, "Spin Your Globe to Long Island," National Geographic, April 1939, imagining Long Island towed to sea by a tugboat,

Off on the FLOATING ISLAND would also go about one-fourth of the sea trade of the whole United States, Uncle Sam's Brooklyn Navy Yard, radio towers from which he talks with 34 countries overseas, his busiest coffee and sugar mart, 3,454 trains that run daily between New York and the island, shops that make navigation instruments for the whole world, strategic airports and plane factories, millionaire estates, herds of polo ponies, Forest Hills' famous tennis courts, five million white ducks, to say nothing of Coney Island and other resorts where millions come to play, and a World's Fair!

Long Island -- Harry Shelland, "Afield and Afloat," Freeport Daily Review, February 5, 1951, a yarn,

One day in the long, long ago when Long Island wasn't here, an Indian fishing off what is now Montauk Point... The Indian saw way off in the distance along the horizon what looked like a tremendous whale, but in reality it was a big FLOATING ISLAND. You can bet that old Indian was scared stiff when he finally made out a huge stretch of land drifting toward him on a fast incoming tide and riding the crests of mighty waves.

The Indian was in a tough spot. If the island bunked into his sail canoe, it would be all up with the Indian. So what does he do, but pull up another and head for what is now Orient Point, where the water was calmer and where he could hide in case the FLOATING ISLAND was inhabited by a savage warlike tribe of cannibals.

Well, to cut a long story short, the long ISLAND FLOATED shoreward end settled where it now is and ever since it has been the mecca for boatmen, fishermen and bathing girls.

Long Island -- David Bouchier, "The Island: Don't Vacation Without It," New York Times, January 31, 1999, relating Long Island to the floating island of Laputa (Chapter 81),

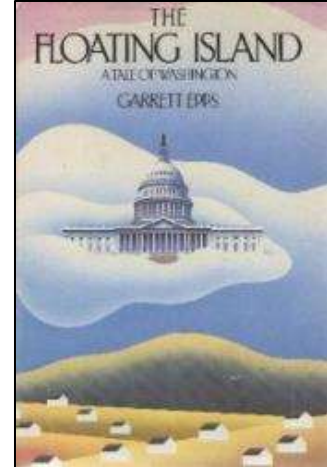
It may sound a bit impractical, but if Jonathan Swift could imagine a FLOATING ISLAND In 1726, surely our modern technologies could achieve it now. All we need to do is saw through the bridges, plug the tunnel and get a few powerful tugboats to move the island off its sandy foundation. Then we could go anywhere, taking our homes and all our comforts with us. This would have many advantages. The New Yorkers and their cell phones would all be left behind, so we would have the Hamptons beaches and restaurants to ourselves. Outside the three-mile limit, we could open our own casinos and get rich, and every beautiful resort in the world would be eager to welcome this largest and wealthiest of all cruise ships.

Chapter 16 -- Permute

New Jersey -- "Let's Fill the Water Buckets," Bloomfield Independent Press, August 14, 1958,

There is no excuse for having water shortages here in New Jersey. One look around will tell us that New Jersey is a virtual FLOATING ISLAND; It is bounded on the East by the Hudson River and Atlantic Ocean, South by the Atlantic and Delaware Bay, West by Delaware Bay and Delaware River.

Washington, DC -- Garrett Epps, the fully metaphoric The FLOATING ISLAND, A Tale of Washington (1985),



Prussia -- "Germany Hints Plea to Alter Treaty Likely," Buffalo Courier Express, December 3, 1927,

The return of the Polish corridor to Germany was mentioned tonight as the first great demand of the German government should revision ever materialize, it being stated that the man in the street in Germany can never become reconciled to the fact that East Prussia is a kind of FLOATING ISLAND, cut off from the German mainland. In German popular view, it was said, the problem was believed capable of peaceful arrangement by giving compensation to Poland.

Central Europe -- Andrezi Stasiuk, Traveling to Babadag (2005),

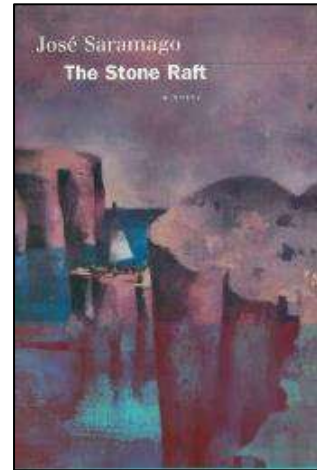
This is what it means to be Central European: to live between the East, which never existed, and the West, which existed too much. That is what it means to be in the middle, when this middle is really the only real land. This land, however, is never firm. It is more like an island, maybe even a FLOATING ISLAND. Or perhaps a ship jostled by the currents and winds from east to west and back again. The cardinal directions of the world, just like the elements, come from the realm of the symbol, allegory, and inevitable concreteness. To live on this island, or this ship, is to observe every shift in the wind, constantly pacing from shore to shore, or from side to side.

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Spain and Portugal -- José Saramago, The Stone Raft (1986). From the author's 1998 Nobel Lecture regarding the Iberian Peninsula,

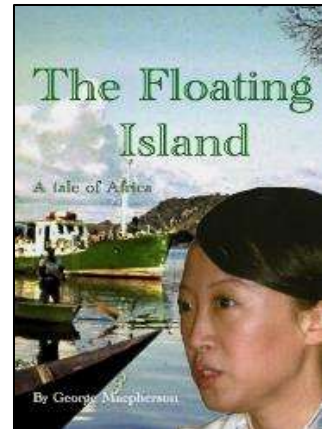
Portuguese resentment of the historical disdain of Europe (more accurate to say fruit of my own resentment), the novel I then wrote, The Stone Raft, separated from the Continent the whole Iberian Peninsula and transformed it into a big FLOATING ISLAND, moving of its own accord with no oars, no sails, no propellers, in a southerly direction, "a mass of stone and land, covered with cities, villages, rivers, woods, factories and bushes, arable land, with its people and animals," on its way to a new Utopia: the cultural meeting of the Peninsular peoples with the peoples from the other side of the Atlantic.



Gaza -- Jennifer Loewenstein, "Notes from the Field: Return to the Ruin that is Gaza," Journal of Palestine Studies, Spring 2007,

In the taxi on my way back from Rafah, I am struck by the sense of isolation this landscape conveys. Gaza feels like a FLOATING ISLAND disconnected from the mainland and allowed to drift out to sea.

Tanzania -- George Macpherson, The FLOATING ISLAND, A Tale of Africa (2010),



Taiwan -- Carol Hamrin and Zheng Wang, "The Floating Island: Change of Paradigm on the Taiwan Question," Journal of Contemporary China, May 2004,

Taiwan appears to be a FLOATING ISLAND -- with scholars and politicians on both sides of the Taiwan Strait and on both sides of the Pacific Ocean debating whether it is inevitably coming closer to China or moving in the opposite direction.

Taiwan -- Zheng Wang, "The FLOATING ISLAND: Change of Paradigm on the Taiwan Question" Journal of Contemporary China 13.39 (2004).

Taiwan -- Life of Pi director Ang Lee: "My Family Values," Guardian, April 26, 2013

Taiwan is like my FLOATING ISLAND. It is an island that's not recognized as a country; it doesn't have a definite identity. It's a very special political situation there: everything's undecided. Floating. It's an island, it's oceanic and I've been adrift, floating like Pi, all my life.

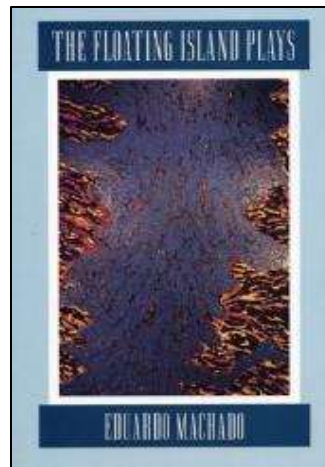
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China -- Wang Anyi, China Urban Ethnographies of Contemporary Culture (2001) by Nancy Chen,

*From looking at a map,
China is only a FLOATING ISLAND,
and its people a floating body,
fluttering toward their eternal destiny.*

Cuba -- Eduardo Machado, The FLOATING ISLAND Plays (1985),

The healing process as a "FLOATING ISLAND," a person with one foot in each country, yet with a heart that is torn apart no matter how many years have passed since his last visit to Cuba.



Guam -- Guam Travel Weekly, September 27, 2004

Like an emerald FLOATING ILE the vast Pacific Ocean, Guam is America's secret tropic isle and the westernmost frontier of the United States.

Floating Isle

Britain -- "Mr. Freeman's Dutchmen," review of The History of the Norman Conquest of England: Its Causes and Its Results (1867) by Edward Freeman, Anthropological Review 8:28, January 1870),

The earlier chroniclers... invented extraordinary fictions to account for ordinary occurrences, and they often omitted to see, or at least to relate, matters which had become familiar to them by experience, and which were, perhaps, disregarded by reason of their familiarity. Hence arose the fables of universal murder, and of nations utterly destroyed, which deserve the same amount of credit as the statement that Britain is a FLOATING ISLAND, appearing now in one part of the Atlantic, now in another.

Britain -- "A Discourse Concerning the Government of Oliver Cromwell," The Complete Works in Verse and Prose of Abraham Cowley (1881),

No man can justify or approve the actions of Cromwell, without having all the seeds and principles of wickedness in his heart.

I wept bitterly for two or three hours ; and when my present stock of moisture was all wasted, I fell a sighing for an hour more ; and as soon as I recovered from my passion the use of speech and reason, I broke forth, as I remember, (looking upon England,) into this complaint :

*Yet, mighty God, yet, yet, we humbly crave,
This FLOATING ISLE from shipwreck save;
And though, to wash that blood which does it stain,
It well deserve to sink into the main;*

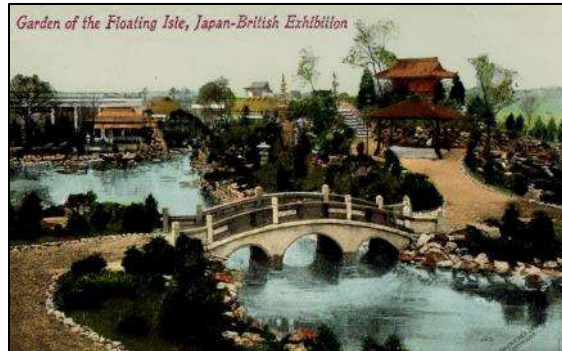
*Yet, for the royal martyr's prayer,
(The royal martyr prays, we know)
This guilty, perishing vessel spare.
Hear but his soul above, and not his blood below.*

Britain -- "Ode upon His Majesty's Restoration and Return," The Works of the English Poets (1790), Samuel Johnson, ed., another of Cowley's diatribes against Cromwell, though a different metaphor.

*Where 's now that ignus fatuus, which ere-while
Mised our WANDERING ISLE?
Where 's the impostor Cromwell gone?
Where 's now that falling-star, his son?
Where 's the large comet now, whose raging flame
So fatal to our monarchy became.*

Britain and Japan -- The Japan-British Exhibition of 1910 in London featured the "Garden of the FLOATING ISLE," a non-floating island in an artificial lake. A temple stood on a rocky hill among trees, a concentration of interest less dainty than surrounding exhibits.

In the words of a reviewer, the vigorous design, "appealed to the lighter mood and seemed to invite gaiety and pleasure".



The exhibition stemmed from Japan's desire for favorable public image following the renewal of the Anglo-Japanese Alliance. The exhibition's "floating island" brought the commonality to point.

Ireland -- Jonathan Swift, "The Inscription," Horace, Book I, Ode XIV Paraphrased and Inscribed To Ireland (1726),

*Poor FLOATING ISLE, tost on ill fortune's waves,
Ordain'd by fate to be the land of slaves;
Shall moving Delos now deep-rooted stand;
Thou fix'd of old, be now the moving land!*

*Although the metaphor be worn and stale,
Betwixt a state, and vessel under sail;
Let me suppose thee for a ship a while,
And thus address thee in the sailor style.*

Madeira -- Pippa Greenwood, "Gardening: Madeira Tour," The Mirror, February 8, 2003,

Madeira -- the Atlantic's FLOATING ISLE of flowers -- is a great holiday destination for gardeners.

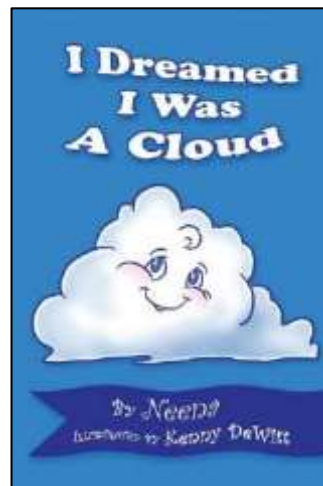
Drifting Island

Rottnest Island off Western Australia -- Margaret Merrilees, "Sighting Rottnest," Griffin Review, Annual Fiction Edition (2011),

Rottnest, I came to believe, is a DRIFTING ISLAND, not attached to the ocean floor. In some weathers it floats close to the mainland. In some, it disappears altogether.

Review of I Dreamed I Was a Cloud (2009) by Neena in Children's Bookwatch, August 201,

I Dreamed I Was A Cloud is the optimistic story of Billow the cloud, a DRIFTING ISLAND of kindly philosophy who encourages all the sad or disappointed people he observes to think of a better way to fill their lives.



Drifting Isle

"E---," on the Dutch Zundersee -- Frederik van Eeden, The Bride of Dreams (1913),

My little city lay as sweetly pensive in the bright glow of sun light as a DRIFTING ISLE of the blessed.

Puerto Rico -- "The DRIFTING ISLE," Economist, February 24, 1979,

Last month the governor of Puerto Rico, Mr. Carlos Romero Barcelo, sent a lengthy letter to President Carter...

Island Afloat

Ireland -- Douglas Harrington, on the Southampton Writers Conference, 2009,

What is it about this tiny ISLAND AFLOAT in the North Atlantic, how is it that it produces writers of such lyric voice?

Governors Island -- "Keeping Governors ISLAND AFLOAT," Regional Plan Association, February 18, 2009.

Cyprus -- "ISLAND AFLOAT? Cyprus Turns to Moscow for Cash," TV-Novosti, March 20, 2013.

Cuba -- Claudia Lightfoot, Havana: A Cultural and Literary Companion (2002),

In severe post-USSR. trauma, the billions of dollars' worth of subsidies from Communist allies that had kept the ISLAND AFLOAT evaporated, and the system that had sustained the Cuban economy for three decades was suddenly gone

Cuba -- "Pros and Cons of U.S. Sanctions Against Venezuela," NBC News, December 16, 2014,

Venezuela's leftist leaders are close allies of Fidel and Raul Castro, and the South American nation's oil helps keep the ISLAND AFLOAT.

Puerto Rico -- "Puerto Rico, Puerto Pobre: The Island's Economic Decline," La Respuesta, June 9, 2013,

Abundant welfare dollars, food stamps and federal aid have been able to keep the ISLAND AFLOAT for a while, but these are either waning or cannot keep up with the growth of Puerto Rico's rampant poverty.

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Bermuda -- "Reinvention keeps the ISLAND AFLOAT," Post Online, November 1, 1999,

Reinvention keeps the ISLAND AFLOAT. Bermuda has become a reinsurance powerhouse but it must change constantly to survive.

Fiji -- "VTP Talks Sustainability at Fiji Talanoa," Vaka Taumako Project, 2014,

Some of those who have sailed on Hokule`a and other voyaging canoes have noted similarities between these canoes and islands; both are small self-contained ecosystems surrounded by oceans. Island peoples like those who live in the Pacific have known this for generations. In recent times, some have extended the analogy to our planet, calling it an ISLAND AFLOAT in the cosmic sea. This makes every person on earth an islander and a member of the planetary voyaging crew.

British Overseas Territory of Saint Helena, Ascension and Tristan da Cunha -- Sean Burns, administrator of Nightingale Island, "Atlantic Oil Spill Threatens Endangered Penguins," CBS News, March 22, 2011,

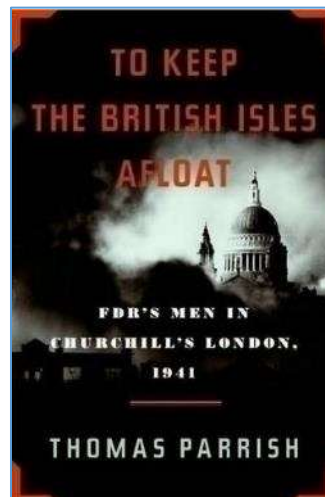
The lobster fishery is what Tristan depends on. The revenue keeps this ISLAND AFLOAT.

Singapore -- Miriam Wei Wei Lo, "Bumboat Cruise on the Singapore River," Over There -- Poems from Singapore and Australia (2008), John Kinsella and Alvin Pang, eds.,

*Rhetoric is what keeps this ISLAND AFLOAT.
Singaporean voice with a strong American accent.*

Isle Afloat

Britain -- Thomas Parrish, To Keep the British ISLES AFLOAT (2009), a history of the Roosevelt administration's support for Britain before World War II.



Britain -- George Canty, "The Lessons of Nicholas Clegg," NextThoughts, April 30, 2010,

The weaknesses of this approach are coming to light in Britain, where both Labor and the Conservatives have struggled mightily to avoid addressing the wrenching changes that, under either party, would be unavoidable to keep the sceptered ISLE AFLOAT.

Ireland -- Alex Salmond, "On the Outside Looking In, While Our Pockets Are Picked," Herald, September 11, 1996,

Those who still subscribe to the imperial prejudice about Ireland will say that it is generous European subsidies that have kept the Emerald ISLE AFLOAT.

Ireland -- John Banville, "Let There be Light," Essay, November 23, 2012, review of Bernard Meehan's *The Book of Kells* (1995),

"There is considerable carelessness in transcription." Reading this, one's deplorably feckless imagination wanders back through the smoke of the centuries to that frail little ISLE AFLOAT in the wild Atlantic, where in a stone beehive hut a lonely scribe, hunched with quill in hand over his sheet of vellum, halts suddenly as he spots a mistranscription, claps a hand to his brow and utters whatever might have been the monastic equivalent of "Oh, shit!"

Ireland -- "The Great Gathering: Ireland Hosts a Tourism Party," WorldPort Global, November 15, 2013,

Despite these FDIs bolstering the gross domestic product (GDP) and local job markets enough to keep the Green ISLE AFLOAT, it did not leave it swimming in the green.

Greece -- Benjamin Ong, "Sell in May," Financial Standard, May 5, 2010,

The European Union/IMF have agreed to keep the Greek ISLE AFLOAT with a three-year, €110 billion lifeline. All was well ... so it seemed. Until last night, when a panic attack again hit equity markets.

Island Adrift

Britain -- Richard Branson, "Why an Exit from EU Would Be Bad for British Business," 2012

Britain needs to get together with Germany to restructure Europe. We are in a position where if we take a positive approach, Germany and ourselves could be the key two countries to the restructure of Europe. Unless we do all this, Britain could be an ISLAND completely ADRIFT in 20 years.

Britain -- Matthew Omolesky, "An ISLAND ADRIFT. Britain and the Future of Euroskepticism," American Spectator, November 2012,

Manhattan -- Frank Rich, "The De Facto Capital," New York Times, October 6, 2002,

New York rose from its initial shock to illustrate in real time what America actually is, a huge and resilient democracy animated by citizens of every conceivable stripe, pursuit and ethic (from those who gave their lives for others at the World Trade Center to those who looted its shopping mall). Instead of seeming, as it often had, like an eccentric ISLAND ADRIFT from the rest of the country, the city found itself valued instead as a concentrated representation of the whole.

Azores -- Mark Twain, The Innocents Abroad (1871),

The mountains on some of the islands are very high. We sailed along the shore of the island of Pico, under a stately green pyramid that rose up with one unbroken sweep from our very feet to an altitude of 7,613 feet, and thrust its summit above the white clouds like an ISLAND ADRIFT in a fog

Taiwan -- "Taiwan, an ISLAND ADRIFT," Wall Street Journal, June 18, 2013,

A flagging economy and demoralized military have created the impression of an ISLAND ADRIFT. To lift this malaise, Taiwan should focus on free trade, innovation and more robust defense spending.

Cuba -- Markus Wolf and Anne McElvoy, Man Without A Face: The Autobiography Of Communism's Greatest Spymaster (1999),

Cuba's recent liberation inspired me and I set off in high spirits for this tiny socialist ISLAND ADRIFT in a sea of capitalism.

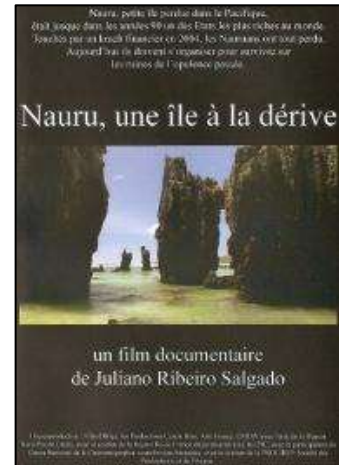
Puerto Rico -- A. Lawrence Lowell,, "The Government of Dependencies," Handbook of the American Academy of Political and Social Science (1896),

If the governor is to exert no real authority it would probably be wiser to cast the ISLAND ADRIFT, providing only that it should hold no communication with the outside world save through the President of the United States.

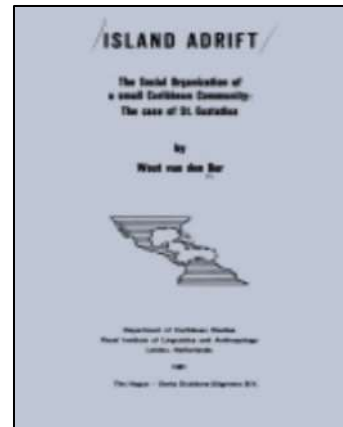
Nauru -- "Nauru, an ISLAND ADRIFT," original title "Naru, Une Ile à la Dérive" (2009), a documentary film by Juliano Salgado,

Nauru, a Pacific island with a population of 7000, gained independence from Australia in 1968. For a hundred years, Nauru's economy has depended on the export of phosphate. After the resource ran out in the 1990s, Nauru tried to turn itself into a tax haven, but pressure from the international community drive most foreign capital out in 2001. Today, Nauru's unemployment hovers around 90 percent.

The adjective "adrift," we come to discover, is regularly applied to unregulated economies in dire straits. (And in saying so, we've created a stronger metaphor by allusion to a narrow and perilous waterway joining two larger waterbodies.)



St. Eustatius -- Wout van den Bor, ISLAND ADRIFT (1981), the social organization of a small Caribbean community: the case of St. Eustatius.



Isle Adrift

Long Island, Maine -- "Maine ISLE ADRIFT Due to Tax Rift," Reading Eagle, November 18, 1992.

Prince Edward Isle -- "Hospitality, Canadian Style Simply Home: Prince Edward Island Beckons," Baltimore Sun, March 28, 1993,

Prince Edward Islanders have a popular greeting, "Come home from away?" The simple question reveals two key insights into islanders' psyches. First, that this is home -- not just a place, but a life with deep roots. Secondly, that everything else is away, for there is a sense of escape about this emerald ISLE ADRIFT in the Gulf of St. Lawrence.

Island That Floats

Britain -- Ernest Jones, New World (1851).

Men of America! thank heaven (thank your own strong arms) for having escaped the corrupt legislation of this ISLAND THAT FLOATS upon the waters like the plague-stricken hull of a

stately wreck, within its death-fraught ribs houses a people of paupers, groaning beneath the immeasurable wealth they have created but enjoy not.

Hawaii -- Charles Stoddard, A Trip to Hawaii (1897),

In the twilight, after leaving Honolulu, we are in the middle sea between two ISLANDS THAT FLOAT like rosy clouds on the horizon.

Hawaii -- David Hill, "The Place of America in World Politics," University Record, April 6, 1900,

Each citizen becomes intent upon his private task, and no one is conscious of the change which time and toil have wrought, while still farther westward, along the track of the sinking sun, far out into the Pacific, Americans continue to wander, building their homes where eternal summer smiles on the ISLANDS THAT FLOAT between the ocean and the stars.

Lake George, New York -- "A College Camp at Lake George," Scribner's Monthly, March 1879,

It is in the glory of its eternal hills, the changeful beauty of its waters, the myriad ISLANDS THAT FLOAT like anchored ships, the piney points, the recessed and dreamy bays that nestle beyond them, the Sabbath stillness, the storm -- sudden and black and fierce, that rouses the water from its golden dream and dashes it white with spray against the rocks

Cuba -- Thomas Carter, The Quality of Home Runs: The Passion, Politics, and Language of Cuban Baseball (2008),

While Cuba is clearly not a singular geographic entity but an ISLAND THAT FLOATS on the currents of Cubans' imaginations and discourses, it is not an unvariegated whole either. How Cuba is constructed depends on one's physical position,

Isle That Floats

Italy -- Augustus Heaton, Memories of Italy: Winter of 1881-1882 (1882),

*The hills are set with gardens, -- as with gems
A queen's tiara, -- where serene await
The vacant halls of kings. Free pleasure stems
The wayward tide to, by the ocean gate,
Rest on those purple ISLES THAT FLOAT in state,
Swan-like, before the zephyr or the gale --
Fair Ischia and Capri, willed by fate
To yield the way to many a conqueror's sail
For Naples so beguiled, defense had light avail.*

Island That Drifts

Ponape, a Caroline Island -- Murray Morgan, Dixie Raider: the Saga of the C.S.S. Shenandoah (1948),

Ascension, the Flower of the Pacific, is a lovely little ISLAND THAT DRIFTS in and out of history like flotsam before the trade winds. One of the Caroline group, it is now known by its native name, Ponape.

Isle That Drifts

Of the 16 permutations we're pursuing, two elude us in the library, "isle that drifts" being one. It's likely out there, however.

Island Floating

Nantucket -- Pam Belluck, Island Practice: Cobblestone Rash, Underground Tom, and Other Adventures of a Nantucket Doctor (2012),

A map of Nantucket, a steel-gray ISLAND FLOATING in an ocean of midnight blue.

Isle Floating

Okinawa -- William Manchester, Goodbye, Darkness: A Memoir of the Pacific War (2008),

As the first shafts of sunlight arrived the mass became lettuce green, an ISLE FLOATING in a misty haze, and in the distance you could see the tom, ragged edges of the ridges supporting the rice terraces.

Island Drifting

Ontario -- Francis Parkman's Works (1909). Huron chiefs summoned the Jesuits in 1648 to meet them at a grand council in which an old orator, chosen by the rest, rose and addressed the assembly,

"My Brother, behold all the tribes of our league assembled!

Pity those who condemn themselves and come to ask forgiveness. It is you who have given strength to the nation by dwelling with it; and if you leave us, we shall be like a wisp of straw torn from the ground to be the sport of the wind. This country is an ISLAND DRIFTING on the waves, for the first storm to overwhelm and sink.

Isle Drifting

"Isle drifting" is the other metaphor not surfacing in our bibliographic query, but again, it's surely in some dusty volume.

And that's but the beginning.

Chapters 1 and 2 speak of "wandering isles." We could use forms of "travel," "rove," "roam," or "migrate," each possibility increasing our possible permutations by the number of ways the term can be substituted.

Alternate adjectives such as "itinerant," "mobile," "migrant," "migratory" and "buoyant" create more combinations.

"Islet" as the noun increases the total by another 50 percent.

There's nary an end to synonymic permutations for "floating island."

CHAPTER 17

LEARN ANOTHER LANGUAGE

Floating islands can enhance our skill in a foreign tongue. We'll note several ways in which this might happen, but we'll exclude (with one exception)

Foreign translations of English works introduced in other chapters. Gulliver's Island (Chapter 81) has been translated into at least 14.

Historic non-English documents translated into English in other chapters.
Scientific literature

We'll not translate titles where we can recognize cognates of "swim," "vagabond," "errant" and "float."

Comics and Juvenile Literature

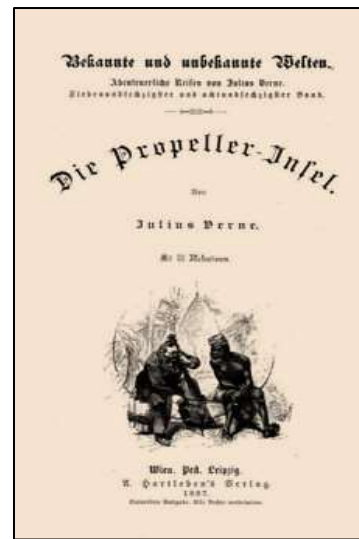
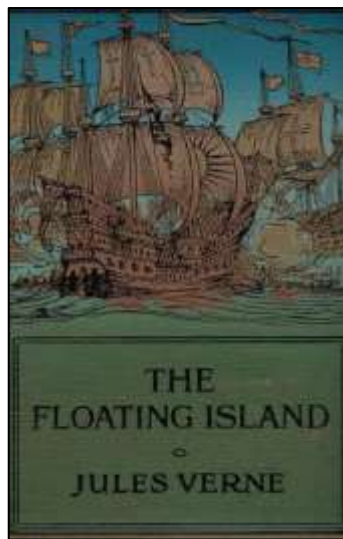
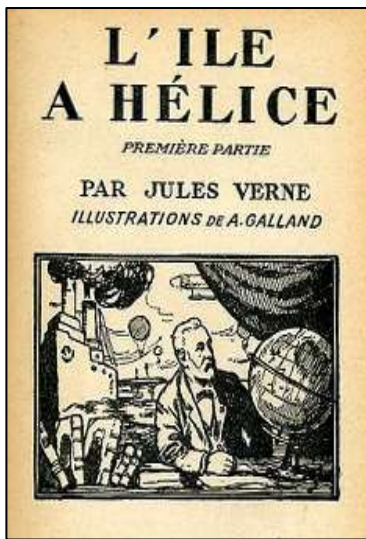
We'll begin with our exception, Jules Verne -- the second most translated author on earth -- whom we discuss in Chapters 11 and 60. Some translations of Verne are reasonably faithful to the author, while others are but a stripped-down plot by a writer working from an intermediate translation.

In perusing foreign-language literature for Verne's "Floating Island," we can be misled. L'île à Hélice (1895), literally "Propeller Island," was released in English as The Floating Island, or The Pearl of the Pacific, with the equivalent of dozens of pages critical of America and Great Britain purged from the original, an example being Verne's 67-starred American Flag, suggesting that the whole of the New World had been subsumed by the United States.



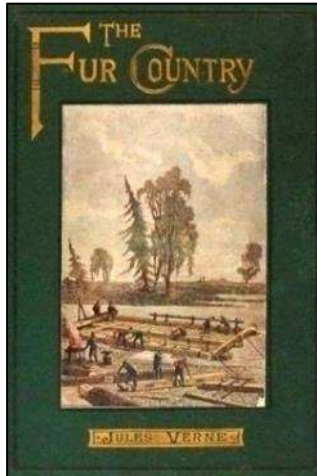
L'île à Hélice has been translated into English more than a score of times, the title generally shortened to The Floating Island.

Below, French, English and German editions.



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Verne's Le Pays des Fourrures (1873) in the three languages.



The UK series of the comic book Classics Illustrated, #41 (1947) is the Fur Country plot with the "Floating Island" title of the English L'Île à Hélice. The German version, a pane-by-pane redo, repeats the switch.

"Floating Island" titles thus float around.



An example of another "floating island" translation, this one of Disney pedigree: "The Floating Island," Donald Duck #226, July 1959, in which Uncle Scrooge finds a floating island by watching satellite images on TV and has to pay taxes every time he comes at across different islands. The comic's been republished 65 times in 22 countries. Below, a few renditions, all translated "floating island."



Italian

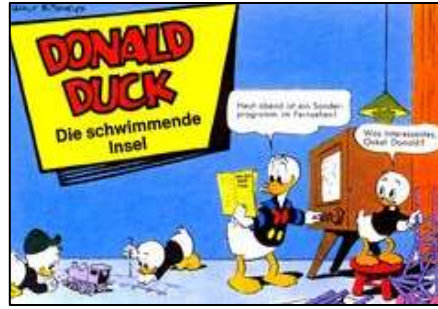


Spanish

Chapter 17 -- Learn Another Language



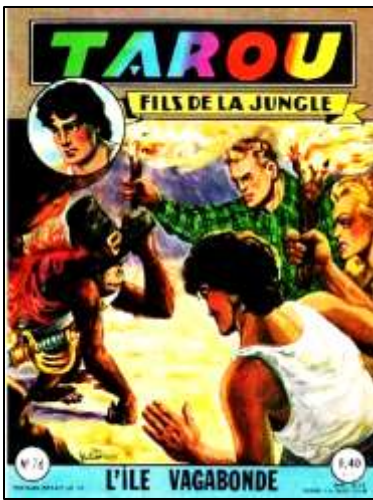
Polish



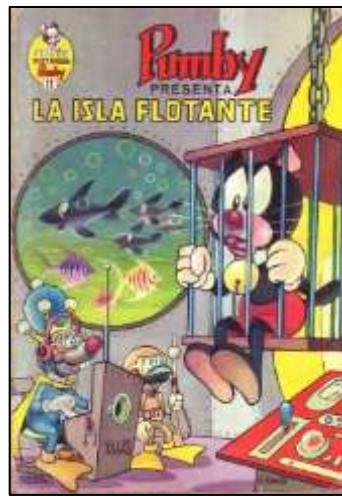
German

As to maintaining the title, Disney beats Verne.

Below, a few more comics and children's books.



"L'île Vagabonde," Tarou #78, June 1960

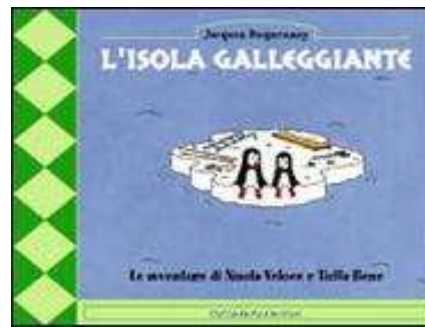


"La Isla Flotante" Pumby, #11, 1968



"Les Robinsons de l'île Errante," Les Aventuriers du Ciel (1950) by R.M Nizerolles

L'Isola Galleggiante. Le Avventure di Nuota-Veloce e Tuffa-Bene (2001) by Jacques Duquennoy.
 "Galleggiante" is said to be floating.



A pair of books about Prince Dinospinohypsilophodobrachiogano Donsaurus Rex, better known as Dinosaurus Klex, who lives on the floating island of Mo



Dinosaurus Klex. Die Schwimmende Insel (1996)



Damals in Dinosaurien -- Die Schwimmende Insel (2002)



"Die Schwimmende Insel," Raka #78, 1997

"Die Schwimmende Insel," Erlebnisse Einsamer Menschen (1916), by Walther Kabel



"La Isla Flotante", Casiano Barullo #13



"La Isla Flotante," Selección Aventurera #13,

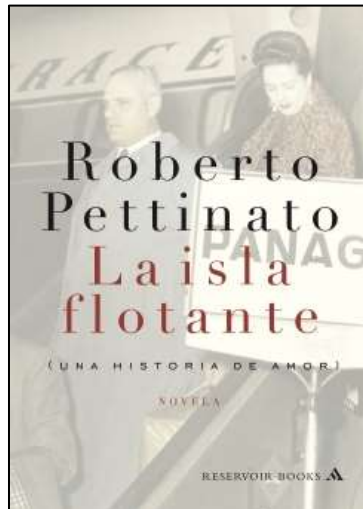


"L'île Flottante," Kamikaze - Collection Audax #19, 1979, though the "island" isn't an island.

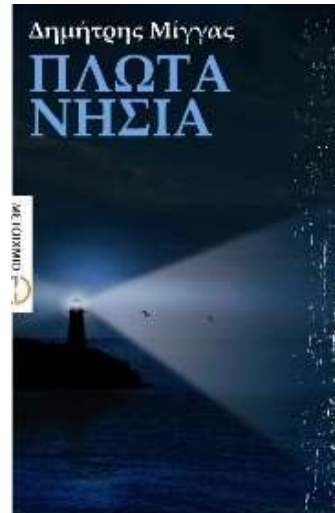
Adult Literature



Paroles d'une île Vagabonde (2011) by Dominique Deblaine. Paroles are lyrics.



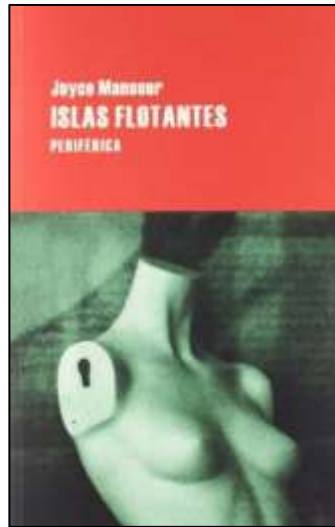
La Isla Flotante (2011) by Roberto Pettinato



ΠΛΩΤΑ ΝΗΣΙΑ (Floating Islands, 2012) by Dimitris Mingas. For those who know Greek letters, the title begins: pi, lambda, omega and tau.



плавучий остров (Floating Islands, 1928) by Ovady Savich



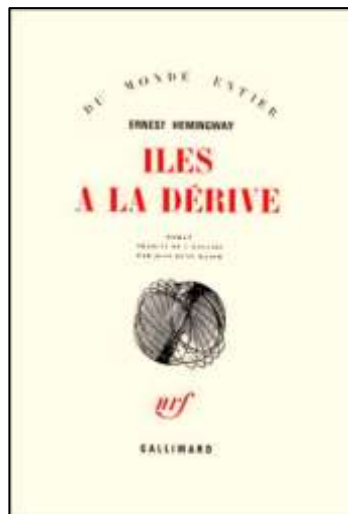
Islas Flotantes (1973) by Joyce Mansour



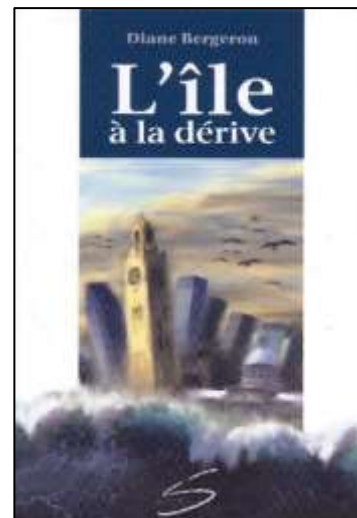
La Isla Errante (2011), Liliane Hasson, ed.



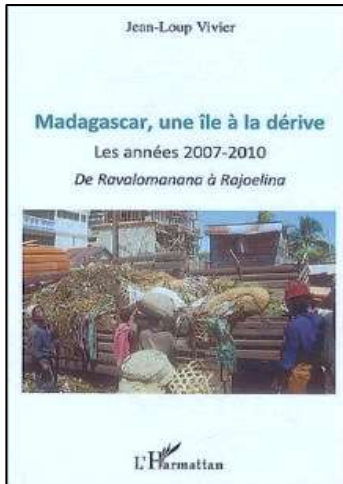
L'île Flottante Infestée de Requins (2001) by Charles Willeford. Requins are sharks.



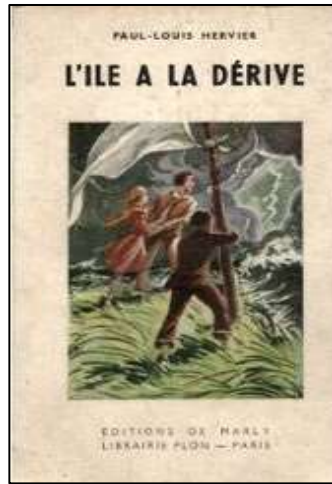
Iles à la Dérive, translation of Islands in the Stream (1970) by Ernest Hemingway. "Dérive" means "drift."



L'île à la Dérive (2008) by Diane Bergeron



Madagascar, an Ile a la Derive (2010), by Jean-Loup Vivier



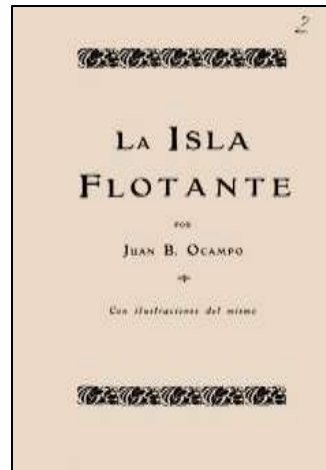
L'île à la Dérive (1945) by Paul-Louis Hervier



浮島 (Oh, What a Floating Island , 2004) by Chien Chen



표류도 ("Drifting Road," but translated as "Drifting Island," 1959) by Park Kyeong-ri



La Isla Flotante (1907) by Juan Ocampo

Games

Cataloging "floating island" video games (Chapter 81) by language would have no end.. Minecraft, for example, can be played in Afrikaans, Arabic, Asturian, Bulgarian, Catalan, Czech, Welsh, Danish, German, Greek, Australian English, Canadian English, British English, Pirate English, American English, Esperanto, Argentinian Spanish, Spanish, Mexican Spanish, Uruguayan Spanish, Venezuelan Spanish, Estonian, Basque, Finnish, French, Canadian French, Irish, Galician, Hebrew, Hindi, Croatian, Hungarian, Armenian, Indonesian, Icelandic, Italian, Japanese, Georgian, Korean, Cornwall, Latin, Luxembourgish, Lithuanian, Latvian, Malay, Maltese, Dutch, Norwegian, Norwegian, Occitan, Polish, Brazilian Portuguese, Portuguese, Quenya (High Elvish), Romanian, Russian, Slovak, Slovenian, Serbian, Swedish, Thai, Klingon, Turkish, Ukrainian, Valencian, Vietnamese, simplified Chinese and traditional Chinese. In many cases, however, particular game-jargon reverts to English.



Cards for the game Yu-Gi-Oh



A German board game in which 13 islands float upon a 20-by-20 matrix sea. Move the tokens and place more islands.



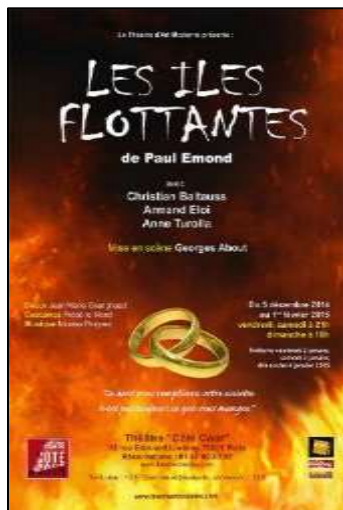
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Cultural Events

Lake of the Bois de Boulogne. Paris, Venetian festival concert on the floating island, 1862. The lake, however, has no island that floats



"La Isla Flotante: Cuba, Arte, Cultura, Diaspora," exhibition at Café Sentido, Barcelona, 2007, in reference to the diaspora.



"Les Iles Flottantes" by Paul Emond, La Compagnie Théâtre Art Moderne, plays off the culinary metaphor (Chapter 84).

Buenos Aires art show, 2011

The scholar of floating islands, it seems, must be multi-lingual

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CHAPTER 18

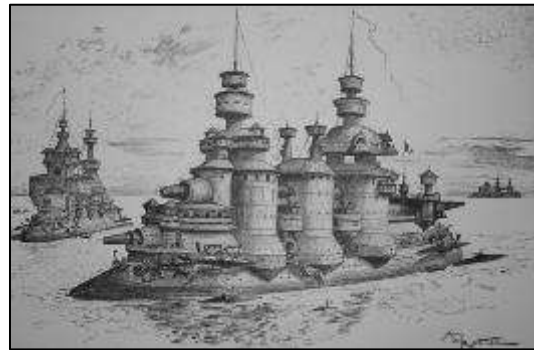
DRAW IT, SCULPT IT OR HUM IT

We'll ignore the advice of John Marr, who, in The Scientific Study of Scenery (1900), advises,

The so-called floating islands, which are sometimes found, may be referred to, though they are of little interest to the student of scenery. One occasionally appears in Derwentwater, and the little lake Llyn-y-dywarchen, between Carnarvon and Beddgelert, in North Wales, receives its name from a similar appearance.

Our collection of floating island art wouldn't fill the wall of gallery, but on the other hand, small galleries are thought of as fashionable.

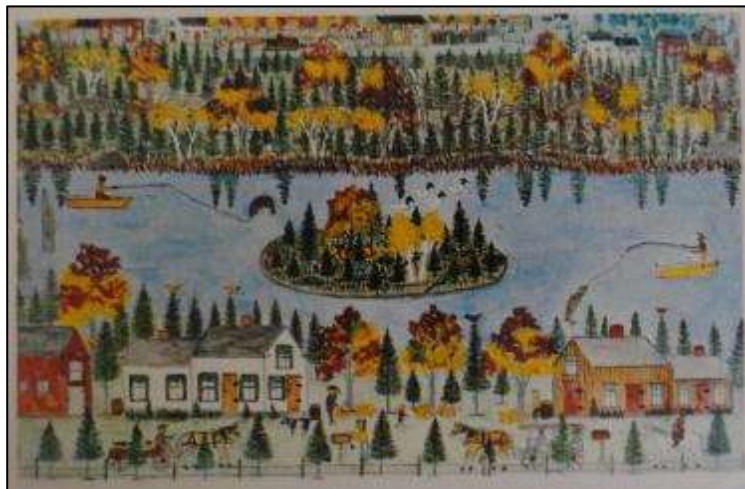
Albert Robida is best known for a trio of futuristic illustrated novels, Le Vingtieme Siecle (1883), La Guerre au Vingtieme Siecle (1887), and Le Vingtieme Siecle -- La Vie Electrique (1890).



Floating fortresses of the future,
circa 1887



"A Floating Island, His Dream"
Life, August 14, 1913

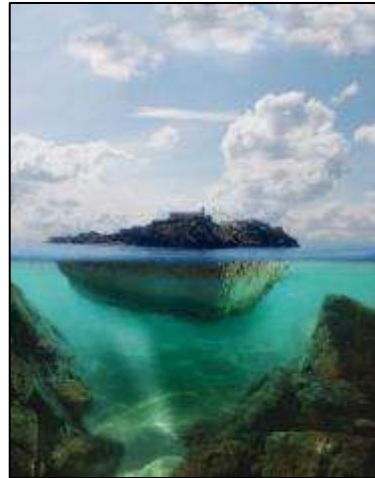


Grandpa Haskins' "Floating Island," undated

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Makiko Kudo, Floating Island, 2012



Created by an anonymous commercial digital artist, a well-balanced perspective of sky and sea with a masterful use of light

A foretaste of the fantasy sky islands of Chapter 81.



Floating Island by Marija Tiurina



The island of Themyscira from the Wonder Woman comic



James Deaves



Fernando Velazquez



Martha de Cunha Maluf-Burgman



Jure Batagelj



Roger Dean's illustrations for the band Yes



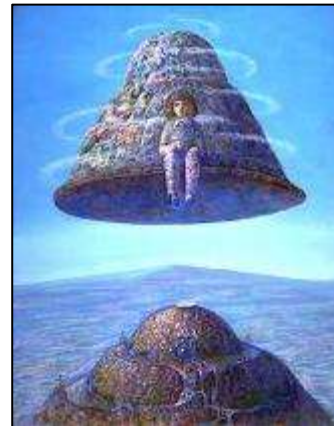
Feel Good, Inc. video

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An concept for access



Below, Naohisa Inoue's world of Iblard in which floating islands appear and disappear



ConceptArt.org is an association dedicated to the art of digital illustration, including a forum in which members develop graphics related to a particular story or theme, usually a fantasy. We illustrate a submission describing the Arctic emergence of a buoyant island.

*Throughout the ages,
Man has always looked
towards the heavens
for answers. Are we
alone in the universe?
The chances they said
of anything coming
from space was a
million to one, little did
we realize that they
were already here.*



For centuries they have lived beneath us, in Gigantic cities beneath our Seas and islands.

Watching, waiting to reveal themselves.

When the first of these Aquatic metropolises surfaced in the far north Atlantic at the beginning of the 21st Century it was the crew of the Canadian Trawler Venture to first make contact.

Chapter 60 has much more to say about ice.

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Sculpture

"3-D Wall Spectacular at Soho," *Wilton Bulletin*, February 24, 1982,

Pamela McCormick shows at the Max Hutchinson Gallery which sponsored her floating island sculpture, Outgrowth Battery Park, in Central Park. In this exhibition she shows the model for Correspondences, an air activated environmental piece created in California and operated by telephone hook-up from the San Jose Institute of Contemporary Art. In another conceptually oriented work over 100 rocks are suspended at eye level from a shaped plastic and wire mount with the relationship of its many parts changing as the viewer shifts position.

"Drifting Island," a 3 by 5-foot ceramic sculpture by Matt Walker, designed to float near the shore of Hamilton Harbor in Ontario. Walker's sculpture alludes to the notion of Turtle Island, a narrative within North American indigenous cultures about the origin of the continent (Chapter 5).



Jackie Brookner's biosculpture, "Veden Taika (The Miracle of Water)," created in 2009 for a pond near a water treatment plant in Finland. The piece consists of three floating islands, two of which contain vegetation that removes pollutants and sediment from the water. The third provides a nesting site for birds.



Zhan Wang's steel "Floating Mountain of Immortals" lies anchored in the North Sea, several hundred off the Belgian coast, it's a bizarre installation by the Chinese artist. The island is part of the Beaufort Art Trail, a collection of international exhibits dotting the Belgian shore. Emblems include a fisherman, an elf, a cell phone and a computer.



Joy Lohmann's "Future-Islands" showed the world as a fragile installation of floating gardens in front of Hanover town Hall, summer 2009.

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For natural art as towable reality, see Chapter 77.



Entang Wiharso

Switching perspective, we've artificial islands fixed to the seabed, but sculpted to portray mobility. Here are two such works, "sails" flying, albeit floating nowhere.



Opera House, Sydney, Australia



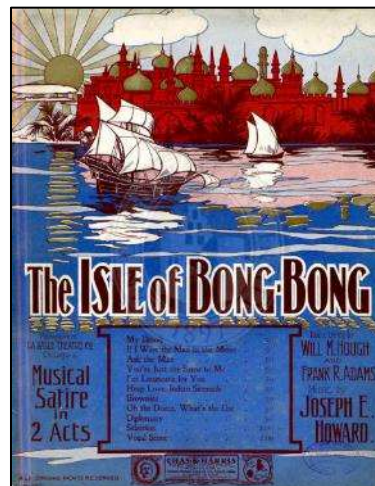
Ventilation shaft for the Tokyo Aqua-Tunnel expressway connecting Kawasaki and Kisarazu

Music

Some musical compositions refer to floating islands, but, as we shall see, the reference may be minor.

The 1906 musical comedy "Isle of Bong" is set on the Philippine island of Mindoro, "Bong Bong" to American soldiers in the Spanish-American War. The plot eluded the critics, but most found the music to be enjoyable

The isle was said to be "floating" although the story makes no use of the attribute.



Catalogue of Augener & Co's Universal Circulating Musical Library, with Supplements (1861) includes "The Floating Island, or Great Eastern Galop" by John Weippert, a waltz played on the great ship.

57434	Weippert.	The festive Union Quadrille	2 —
57435	—	The floating Island or Great Eastern Galop	2 6
57436	—	The Trovatore Waltzes	3 —

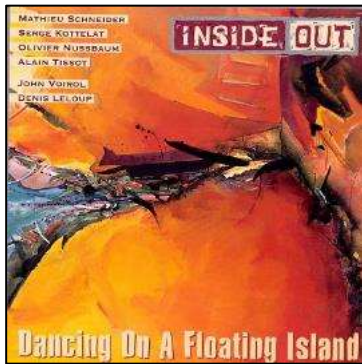
Catalog of Copyright Entries, Musical Compositions: Part 3 (1912), Library of Congress. cites a comic opera, but once which doesn't seem to have been since staged.

FLOATING ISLAND; comic opera in two acts, dialogue and lyrics by Chauncey L. Parsons, music by T. Gorecki; vocal score. [9286
© 1 c. May 18, 1912; E 284861; Thaddeus Gorecki, Baltimore.

"Fays of the Floating Island," a cantata by Paul Bliss, was performed by school choruses through the 1920s and 30s, but again, seems to have fallen from directors' favor.

- a. *Evening* -- An evening 'mid the floating islands in the South where the water lilies grow.
- b. *The Cricket Band* -- The fays (or fairies) in the moonlight, all are dancing to the ceaseless music of the cricket band.
- c. *The Flight of the Fays* -- Three fairies, wearied, run to the water's edge and there espy a cob-web reaching out through the dark to a neighboring island.
- d. *The Song of the Fays* -- They seek rest--they hurry across the gossamer web and sing of the beauties of the new island. ,
- e. *The Storm* -- Suddenly a storm arises. The clouds hide the moon and the fairies become frightened
- f. *Return of the Fairies.* -- The storm quickly passes, the moon shines out; and upon its silvery beam the fairies tip-toe back to their home.
- g. *The Dance* -- The wild dance goes on

As for compositions more recent,



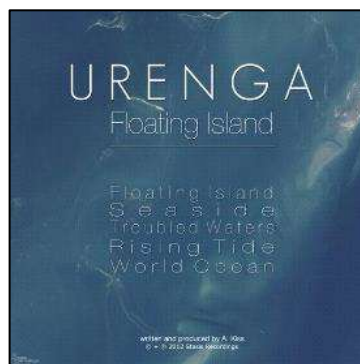
Inside Out



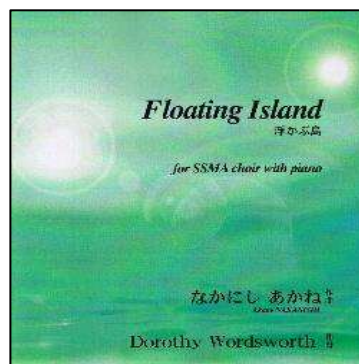
Mr. Joseph



Lotte Anker



Urenga



SSMA Choir

DRAFT 3/30/2018

CHAPTER 19

OBEY ARCHIMEDES' LAW

This chapter and the next will focus on questions of physics. In some cases, we'll note specific floating-island examples. Most discussion, however, will concern itself with quantifiable estimates of particular behaviors, real-life examples throughout the rest of the book.

Our basic premise isn't that we would want to calculate everything that might be observed, but rather than when we see an aspect of nature that seems to be somewhat repeated, it's probably a manifestation of known physical law.

This chapter deals with buoyancy, Why do some islands float, and if so, what at a particular level?

Buoyancy

"I have a kind of alacrity in sinking." -- Falstaff, in *Merry Wives of Windsor*, describing his narrow escape from Madam Ford's husband by hiding in dirty laundry and subsequently being dumped into the river.

Islands, on the other hand, generally have an alacrity to floating.

Bulk density γ_{bulk} , a body's total weight per unit volume, depends on material composition, particle shape and size, orientation of particles, specific density of individual particles, particle size distribution, moisture content, and applied axial pressure. Such variables are not necessarily independent. Moisture content, for example, has an effect on particle density and surface characteristics. Similarly, particle size and distribution depends on such formative processes as chopping, drying, grinding and sieving.

Typical values

Bulk Density	g/cc	Bulk Density	g/cc
Bark, wood refuse	0.240	Peat, wet	1.121
Barley	0.609	Pumice (Chapter 30)	0.641
Clay, dry excavated	1.089	Rock - soft	1.600-1.780
Clay, wet excavated	1.826	Sand, wet	1.922
Earth, loam, dry, excavated	1.249	Sand, wet, packed	2.082
Earth, moist, excavated	1.442	Sand, dry	1.602
Earth, wet, excavated	1.602	Sand, loose	1.442
Grain - Wheat	0.780-0.800	Sand with Gravel, dry	1.650
Gravel, loose, dry	1.522	Sand with Gravel, wet	2.020
Gravel, with sand, natural	1.922	Sawdust	0.210
Gravel, dry 1/4 to 2 inch	1.682	Shale, solid	2.675
Gravel, wet 1/4 to 2 inch	2.002	Shale, broken	1.586
Limestone, solid	2.611	Turf	0.400
Limestone, broken	1.554	Water, pure	1.000
Peat, dry	0.400	Wood chips, dry	0.240-0.520
Peat, moist	0.801		

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Rhizome and peat mats of Tanana Flats, Alaska,

Bulk Density	g/cc
Dry	0.12 - 0.18
Wet	0.80 - 0.95

A body having a bulk density less than 1.0 g/cc floats in water, the submerged proportion of that body's volume equaling the decimal value of γ_{bulk} . If the body's bulk density exceeds 1.0, it sinks.

As γ_{bulk} varies with saturation, however, and saturation depends upon how much of a floating body is beneath the water surface, estimating a floating island's buoyancy can be more than a table look-up.

We'll build our own buoyancy model for a floating island made up of four components, uniformly distributed:

- Biomass -- pants, roots, detritus from decayed vegetation, and the like.
- Soil -- mass bank erosion, eolian deposits, sediment from wave wash-up, etc.
- Gasses -- most often air, but in some cases, products from decomposition
- Water

Let us likewise simplify a floating island's shape to that of an arbitrary surface area having uniform thickness.

- W is the weight, if any, imposed upon on the body, apart from its own weight, per unit of surface area.
- γ_{veg} is the biomass solids unit weight, for sphagnum, roughly 1.4 g/cc. Air vacuoles (aerenchyma) encapsulated within the densely-interwoven root systems and aerenchymous rhizomes are included, but drainable voids are not.
- γ_{s} is the soil particle unit weight, roughly 2.6 g/cc for pumice, closer to 2.0 for organic media. Interstitial voids are not included in the volume.
- γ_{w} is the water unit weight, 1 g/cc for fresh water.
- γ_{g} is the gas unit weight, 0.
- F_{veg} is the vegetation solids volumetric proportion of the body. When submerged, vented pores fill with water; unsubmerged, they drain by gravity.
- F_{s} is the soil solids volumetric proportion of the body.
- F_{eg} is the entrained gas volumetric proportion of the body. As entrained gasses have no outflow path from within the body, when submerged, the gas remains below the surface. Gas entrainment varies with both age and season. In older and thicker mats, gaseous buoyancy associated with anaerobic decomposition becomes more important. The roots themselves may accounts for only 10 to 20 percent of buoyancy in 40 to 60-centimeter thick rafts.
- F_{ew} is the entrained water volumetric proportion of the body. As entrained water has no outflow path from within the body, when unsubmerged, the fluid does not drain.
- F_{vent} is the vented pore volumetric proportion of the body. When submerged, such pores fill with water; when unsubmerged, they drain by gravity.

Seawater γ_{w} is close to 1.02 g/cc. To retain 1.00 in formulae for simpler calculation, adjust γ of the floating body by dividing by the true γ_{w} . If the body, for example, has a true γ of 0.90 g/cc, compute using $0.90/1.02 = 0.88$.

Note that our model does not employ the materials dry bulk density, a measurement made on an oven-dried specimen that can be in the 0.1 g/cc range. Natural floating islands are not oven-dried.

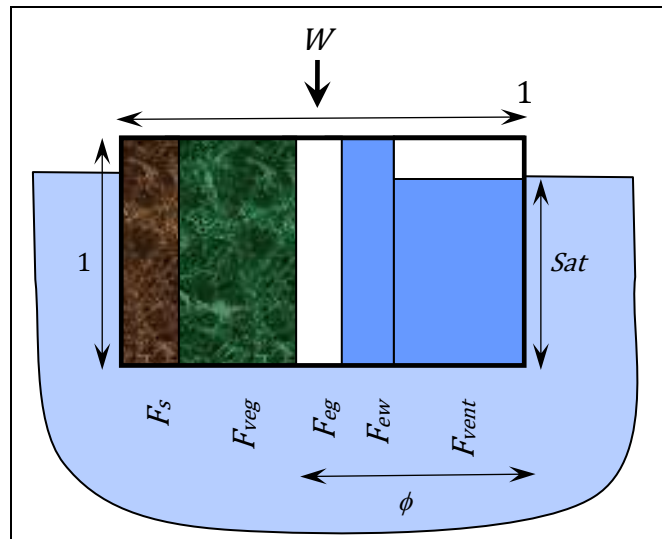
Summing the fractions,

$$F_{veg} + F_s + F_{eg} + F_{ew} + F_{vent} = 1$$

For a floating body, F_{vent} contains $Sat F_{vent}$ and $(1-Sat) F_{vent}$ of water and gas, respectively, where Sat is the vented pores' degree of saturation as a decimal.

Porosity ϕ is the sum of F_{eg} , F_{ew} and F_{vent} , a body's volumetric proportion of voids.

Graphically,



Bulk density γ_{bulk} , a body's total weight per unit volume, varies with saturation.

$$\gamma_{bulk} = \gamma_{veg} F_{veg} + \gamma_s F_s + \gamma_w (F_{ew} + Sat F_{vent}),$$

where saturation Sat varies between 0 when the vented pores are dry and 1, when the pores are filled with water.

The proportion of a floating body's F_{vent} that fills with water equals the proportion of the body submerged below the water level, Sub , which is to say that $Sat = Sub$

Employing Archimedes' Law -- the buoyant force on a floating object equals the weight of the water displaced,

$$Sub \gamma_w = W + F_{veg} \gamma_{veg} + F_s \gamma_s + (F_{ew} + Sub F_{vent}) \gamma_w$$

We could, in fact, add other weights, if we deemed them significant, the weight of capillary water raised above the water surface being one possibility. To not unduly complicate our model, we'll not add this, but one can see how such terms might be added to the right-hand side.

As γ_w is 1.0, rearranging the above,

$$Sub = \frac{W + F_{veg} \gamma_{veg} + F_s \gamma_s + F_{ew}}{1 - F_{vent}}$$

If W is zero,

$$Sub = \frac{F_{veg}\gamma_{veg} + F_s\gamma_s + F_{ew}}{1 - F_{vent}}$$

As an example, let F_{veg} be 0.06, F_s be 0.01, F_{eg} be 0.01 and F_{ew} be 0.01. As F_{vent} brings the sum to 1.00, F_{vent} is 0.73. Let γ_{veg} be 0.2 g/cc and γ_s , 2.0. From the above equations, Sub is 0.489. If we increase γ_{veg} to 0.9 g/cc, Sub is 0.644. If we also increase F_s to 0.05, Sub is 0.819.

A freely-floating object's equilibrium vertical orientation is such that object's center of gravity is directly below its fluid displacement. A freely-floating object will bob up and down with the water surface.

Risto Kuusiniemi and Suokko Tuulikki, in "Experiences from Environment Consequences in Operation of Reservoirs in Finland," Transactions, Sixteenth International Congress on Large Dams (1988), advise that reservoir peat floatation can be prevented by excavating the peat before the reservoir is filled -- a somewhat obvious solution -- or spreading a 7 to 15 centimeters of gravel on the peat before the reservoir is flooded. Such application would be a costly and problematic endeavor, but were it done, it would be well to do a calculation based on the principals of buoyancy.

$$\frac{t_s}{t_p} = \frac{1 - SG_p}{SG_s - 1}$$

where,

t_g is the thickness of stone,

t_p is the thickness of the floatable peat.

SG_g is the stone specific gravity, perhaps 2.5

SG_p is the peat specific gravity, perhaps 0.7

Using these estimates, h_g/h_p is 0.20, allowing no factor of safety.

Occasional Misinterpretations

Consider the following explanations of peat buoyancy at shallow submergence.

"Floating Islands of the World," Down to Earth, July 15, 2006,

If the peat is covered by deep water, the weight of the water over it holds the peat to the bottom, but in shallow parts of the reservoir, less than two meters deep or so, this buoyancy can tear away sections of peaty soil up from the bottom of the reservoir, and they rise to the surface as floating islands.

"Bolton's Mysterious Roving Islands," Bolton Community News (June, 2004) summarizes "Crane, Bulldozers Tear Apart Roving Island in Bolton Lakes," Bridgeport Telegram, February 28, 1955.

The lower lake levels decrease the overburden of the water that normally holds the peat down and compresses it. A lower lake level allows the peat to expand, increasing its buoyancy. Once part of the peat begins to tear away from the bottom, the water gels under it and there is no longer any overburden, just pure buoyancy force. Heavy soils drop away and a new roving island is born.

The sounder parts of the explanations reduce to the following:

Hydrostatic pressure decreases,
The peat swells, becoming less dense,
And thus it floats.

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The only parameter to change in our mathematical model is F_{eg} , the entrained gas volumetric proportion. Boyle's Law states that the product of volume and absolute pressure remains constant. At 10.06 meters of submergence, F_{eg} will be half of its value at the surface. At 20.12 meters, it will be one-third. Because of gas compression, a body's bulk density thus increases with depth. As none of the other parameters effectively change, however, the relative effect on buoyancy is less than the relative change of gas volume.

A set of numbers that would explain a peat pop-up on this basis: Let F_{veg} be 0.06, F_s be 0.05, F_{eg} be 0.043, F_{ew} be 0.01, γ_{veg} be 0.9 g/cc, and γ_s be 2.0. By calculation Sub is just slightly above unity, which is to say that the mass does not float. Decreasing the depth of submergence by 5 percent raises F_{eg} to 0.045 by Boyle's Law, and Sub becomes slightly less than unity, the floating condition.

Mechanisms other than simply a decrease of water pressure, however, are more likely to play the greater role in real-life pop-ups.

Gas generation.

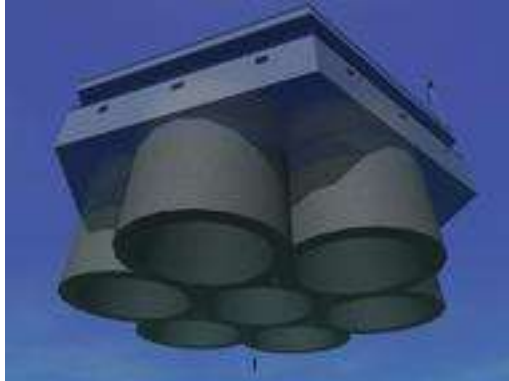
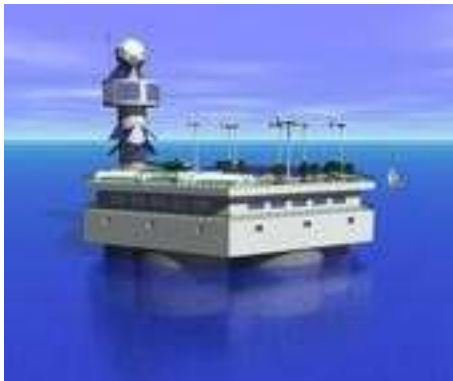
Falling away of soil affixed to hanging roots.

Surface disturbances. A storm-caused wave of a given height, exerts more localized shear on the bed of a shallow pond than it would in a deeper pond, and peat attached to the bed of the shallower pond may thus be more prone to be torn free by such a disturbance.

Jan Pousette, in Lokka and Porttipahta Dammed Reservoirs (1965), notes that floating peat in Swedish lakes often rises with the approach of bad weather, hypothesizing that stormy weather entails a lower atmospheric pressure which increases the volume of entrained gas.

Unlike the buoyancy effect of seasonal methane production (a la Derwentwater, Chapter 48), the physics do not suggest this degree of sensitivity to natural atmospheric variation. The mathematics are the same as our example dealing with submergence, except that F_{eg} will vary by no more than a few percent. Other than at the eye of a hurricane, the Swedish perception seems to be a preconception.

Inverted Cylinders



Boyle's law states that at a given temperature, the product of pressure and volume of a fixed number of gas molecules remains constant. For a prismatic, open-bottomed chamber,

$$\frac{H_c}{H} = \frac{P_a}{P_a + \gamma(D + H_c/2)}$$

where,

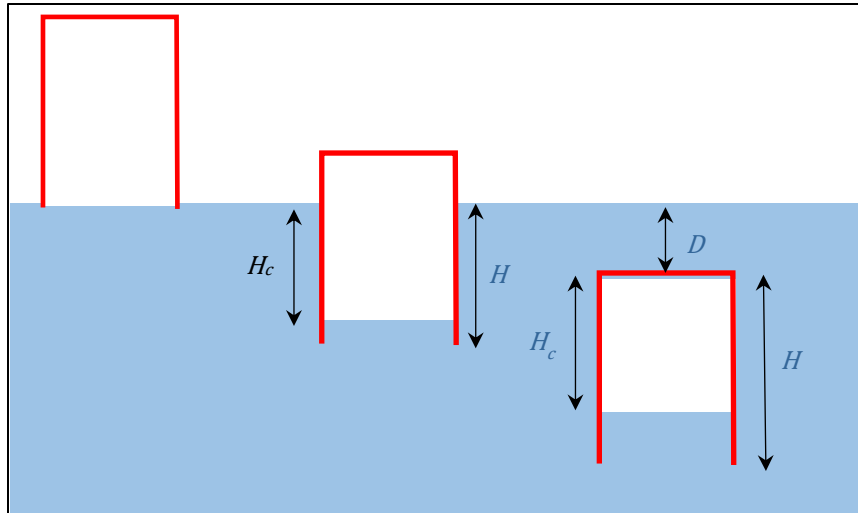
H_c is the height of compressed air in the submerged portion of the chamber,

H is the height of the submerged portion of the chamber,

P_a is atmospheric pressure

γ is the unit weight of water, and

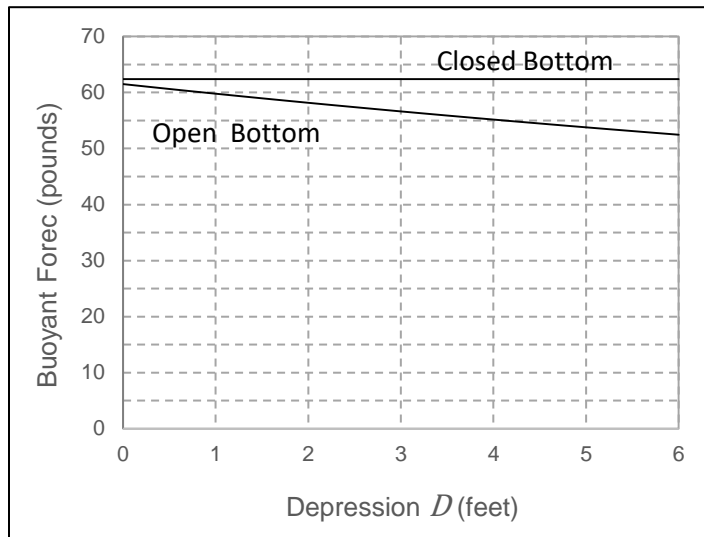
D is the submergence of the top of H_c , below the water surface.



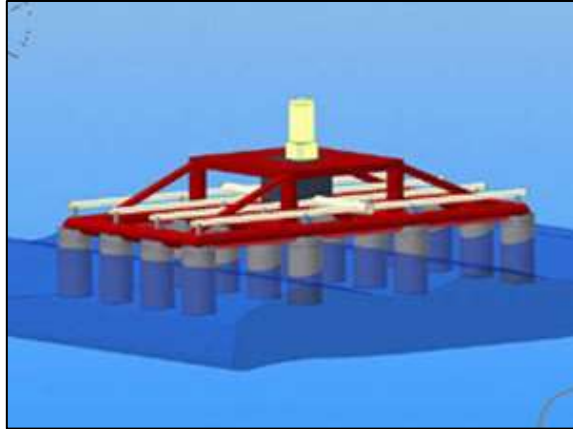
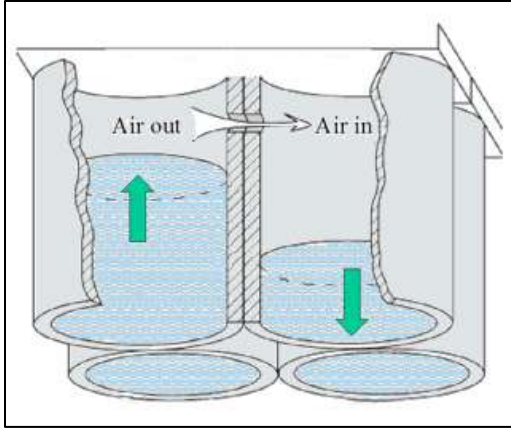
An example: A 1-foot cube air-filled when above the water surface. If the cube has a closed bottom face, it always contains 1 cubic-foot of air.

If the cube has no bottom face, the air that filled the cube when it was above the surface compresses as the cube descends below the water surface. H_c is 0.986 when the cube's top is at the surface. H_c is 0.841 when the top is 6 feet below the surface. From this, the buoyant force can be computed.

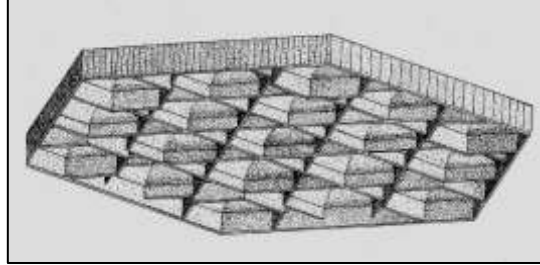
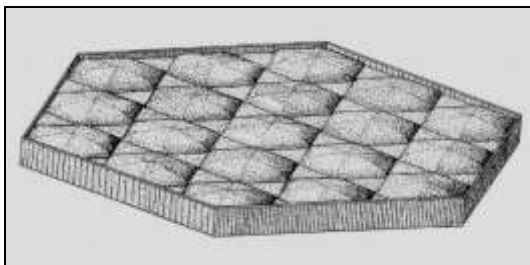
$$\text{Buoyant Force} = \gamma H_c$$



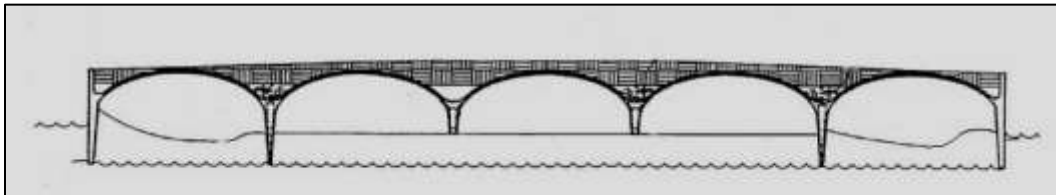
Yet to be economical, but sound in physical principal, a pneumatically stabilized platform consists of multiple open-bottomed cylinders with interconnecting pneumatic lines. When a wave rolls under a cylinder, the air pressure in the airspace increases and air flow via the pneumatic lines to a less-pressurized neighboring cylinder, dampening peak wave load on the structure. A turbine on the line can function as an electrical generator, though at some cost to the wave dampening.



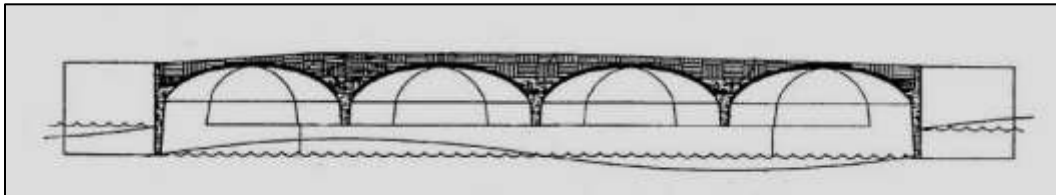
The concept is the basis for US Patent 5524549 A, "Artificial Floating Island," (1993) by Richard Morris, for a floating island formed from a hexagonal primary cell, perimeter balance cells, and secondary smaller, of differing wall heights. The length of each cell-wall is the same. The primary cell decreases pitching and rolling due to waves by allowing air to laterally move under the cell walls/beams, lessening island movement by maintaining a more-uniform pressure distribution under the structure.



Top and bottom views



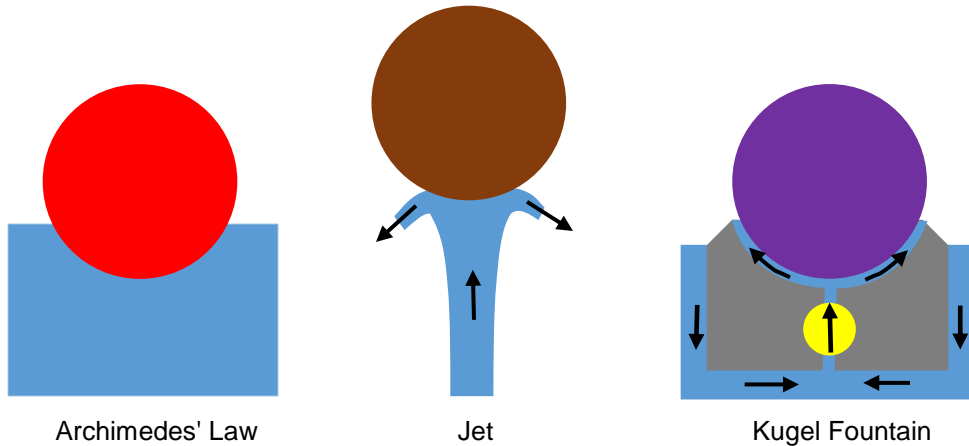
Balance cells and secondary cells. Water is displaced by air pressure under the island.



The trough of the wave receives the air displaced by the swell under the primary cell.

Floating Spheres

Spheres can be said to "float" in water for three different reasons.



We're acquainted with Archimedes' Law: a buoyant body displaces its own weight of water. We'll simply indicate the equations and graph the result.

$$Sub^3 - 3Sub^2 + 4SG = 0, \quad 0 \leq SG \leq 0.5$$

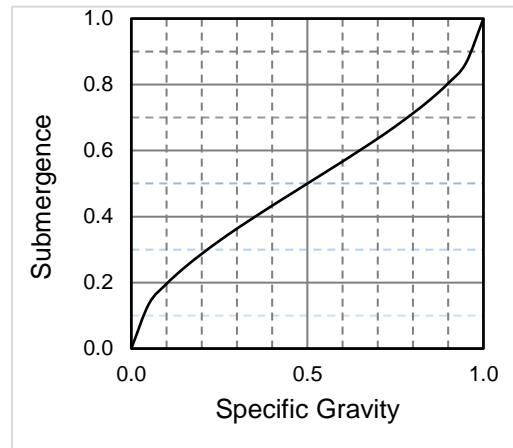
$$\frac{(2 - Sub)^2(1 + Sub)}{4} + SG = 1, \quad 0.5 \leq SG \leq 1$$

where,

Sub is submergence, 0 if floating totally above the water surface, 1 if completely submerged

SG is the sphere's specific gravity

Were the object a block, not a sphere, the function would plot as a straight line from 0,0 to 1,1.

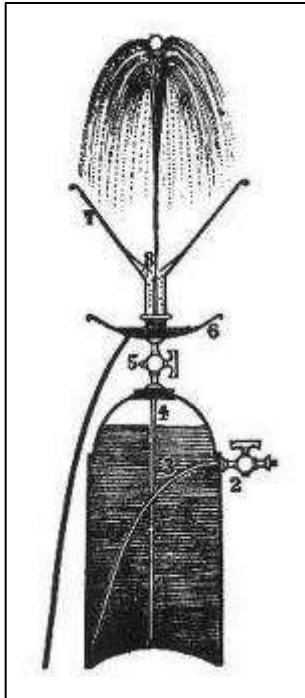


A ping pong ball, having a specific gravity of almost nothing, barely submerges. A wooden ball having a density just slightly less than that of water floats almost entirely beneath the surface.

For what it's worth, if the floating fantasy to the right can be taken to be a sphere five-sixths submerged, its specific gravity is 0.93, nothing like the 2.6 that might be associated with what appears the illustration's rocky composition.



A sphere placed in upward-directed fluid jet can be levitated by several forces, and in some cases, likewise kept in balance. The fluid could be either liquid or gas; the physical laws are the same. The sphere could be hollow and light or solid and weighty. It takes, however, certain combinations of sphere and fluid properties for the apparatus to produce the desired result.



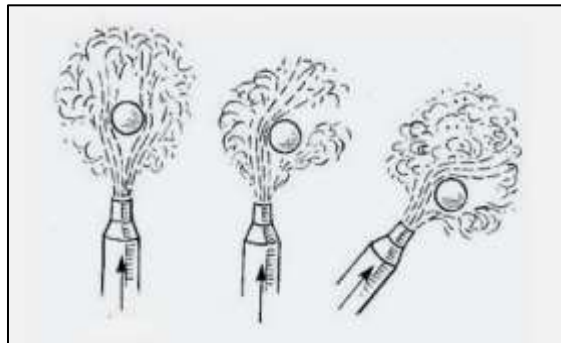
If the sphere is centered in the jet, the impact from below and the drag from fluid running up the sphere's surface can elevate the sphere.



If the sphere becomes slightly off-center, say to the right, the flow impacting the sphere's left side becomes greater than that on the right, potentially causing some of the left-side flow to wrap around the sphere's top and meet what's rising on the right. The result is a jet shed in a rightward direction which translates into a force, the net effect pushing the sphere back to the left.

A second mechanism can act in a stabilizing manner, as well -- the Bernoulli energy-conservation relationship (Chapter 20), in which if kinetic (velocity) energy increases, pressure energy accordingly decreases. It's why wings lift airplanes. If the sphere is off-centered, again say to the right, the fluid will flow faster on the left side and the pressure on that side will decrease. The lateral pressure imbalance pushes the sphere back to the left.

The Bernoulli stabilization phenomenon is well illustrated by a ping pong ball inserted in an air stream, even for a jet tilted at an appreciable angle.



A heavier ball can be lifted by a jet of water, but the required discharge may be impractically large. A 1-foot, 65-pound sphere, for example, can be levitated by roughly 3500 gallons/minute (far above that provided by a standard fire-fighting pumper) concentrated in a 3-inch nozzle, but the stabilizing forces would likely be too small to keep it there for long.

Another aspect of a jet-suspended ball is mentioned in "Home-Made Fountains," Pearson's Magazine, January-June, 1903, by J.H. Vincent and Frank Carr.

A feature of many old-fashioned fountains was a ball balanced by an up-springing jet of water. To set a home-made fountain to play with a ball, it is only necessary to attach a short piece of flexible tubing to the scullery -- or any other -- tap, to fit on its end a glass nozzle with an aperture of one-sixteenth of an inch, and to drop a celluloid ball into the water jet that gushes up from your fountain when the tap is turned. Then the ball dances on the water in the prettiest way, and the water flies off from it with showers of spray. Looking closely, you will see that the water does not strike the lowest part of the ball, but hits one side of it, causing it to spin on a horizontal axis, and to scatter the water like sparks from a catherine wheel.



From 12 inches to 10 feet in diameter and ranging between 100 and 85,000 pounds, precisely-milled "kugel spheres," usually of granite, appear to float in their spherical-concave sockets as a fountain feature in museums and public parks. Water pressurized to only a few pounds/square inch is pumped into the socket through a nozzle sized at about 10 percent of the socket surface. The water's lubrication allows the sphere to be spun with surprising ease.



An explanation frequently proposed for kugel "flotation" is Archimedes' Law, as if the sphere were an iceberg or a ship. Another common explanation cites the "the incompressibility of water." Both are incorrect.

"Physics of the Granite Sphere Fountain," to appear in American Journal of Physics, (2014), by Jacco H. Snoeijer and Ko van der Weele, summarized the explanatory mathematics. The kugel fountain can be thought of as a giant roller bearing. As the pressure within the fluid layer of thickness t scales as $1/t^3$, a remarkably-thin t adjusts such that the integrated pressure balances the weight of the levitated object. Owing to the smallness of t , viscous forces within the flow dominate over inertial ones.

The kugel fountain at the House of Science in Patras, Greece is a 1-meter granite sphere immersed in a basin subtending the sphere to an angle of 35 degrees. At 1.5 liter/second, the calculated t is 0.31 millimeters, in close agreement with the 0.30 ± 0.05 -millimeter measurement. At a discharge of 0.3 liter/second, t is 0.18 millimeters.



A granite sphere fountain can in fact operate on air. As compared to water, both viscosity and inertial effects become smaller, but not to the same degree. While the viscosity is reduced by a factor of 50, the density is reduced by more than a factor 1000. Successful lubrication of the kugel with air thus relies not on a strong airflow, but on the exactitude of the stonemason. A 0.4-meter airborne kugel of black granite was exhibited at the 2004 International Granite and Stone Fair in Bangalore, India.

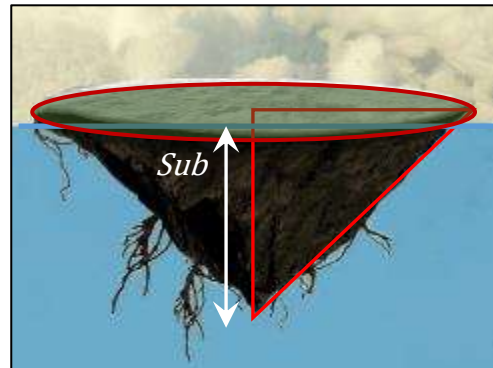
Floating Cones

Artists are prone to depict a floating island as a cone, as if the island were plucked for replanting from a garden bed. A few trailing roots add horticulture realism. While few, if any, of nature's floating islands have been accurately surveyed on their underside, most appear to be not conical, but of a somewhat-uniform thickness, and thus lend themselves to the submergence calculation earlier presented. For the sake of the artistic renditions, however, we can estimate the submergence for the conical case. It's surprisingly simple.

$$Sub = \sqrt[3]{SG}$$

The portion of total depth under water is only a function of the body's specific gravity. If the latter is 0.9, Sub is 0.96, which is to say that 4 percent of the island's total height rises above the water.

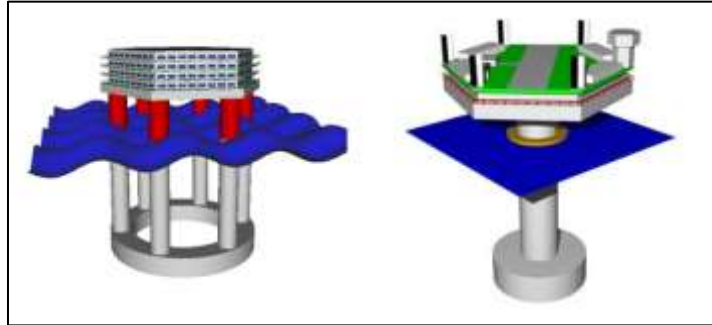
A conical island will most likely float apex-downward, but determination involves "minimum metacentric height," more math than we care to pursue. The most stable orientation may be in a tipped position.



Floating Spars

An oceanic tower (Chapter 71) can be set above the waves, but is immobile and requires long, expensive columns. A logical solution is to employ thin legs, a la a pillared platform, but to have them resting on submerged buoyancy.

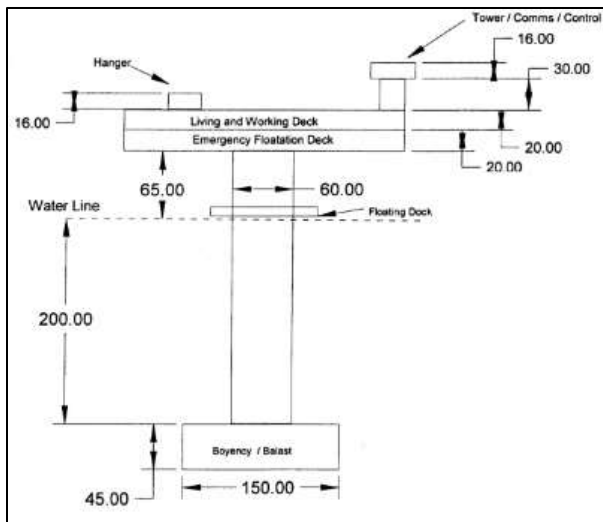
Since a platform can only cantilever out so far, multiple pillars would be necessary to support large structures, A smaller platform, however, can sit upon a single ballasted spar, allowing for additional modularity.



Robert Ballard (finder the Titanic) proposes constructing a ballasted spar buoy topped with somewhat-larger living quarters.



Below, a conceptual 20,000-ton single-spar platform, 30 feet above water, with multistory living quarters and helipads.



Philos vs. Alphabeticus Regarding Floating Saucers

The following communications from the Monthly Magazine, or British Register, 1817 and 1818 relate to the floating island of Derwentwater (Chapter 48), but as their arguments are based on physical principals, we'll confine ourselves to their general nature.

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The discussion begins with a submission by "Philos," the 19-year-old Robley Dunglison who would later immigrate to America and become personal physician to Thomas Jefferson. "Alphabeticus," the identity of whom we do not know, finds fault and Philos responds. Both positions employ spurious science, Alphabeticus' being perhaps the more flawed.



"Letter Discussing the Causes of the Buoyancy of the Floating Island in Derwentwater," 43:4 (May 1817), by Philos.

What can be the cause of so large a mass of earth being raised in a fluid, than which it is specifically heavier, is at subject not easy of explanation; the force exerting itself must, however, be supposed to be very powerful.

An hypothesis has been advanced, that the air contained in the air-cells of the aquatic plants vegetating upon it, might be sufficient to buoy up the mass; but it is quite impossible that this small portion of elastic fluid could have such an effect. From a mountain nearly opposite the site of this Floating Island, a rill descends, the water of which sinks into the sand at the foot of the mountain, and disappears: hence, it has been supposed, that the alluvia of vegetable matter might be carried under that part of the lake, by means of the rill, during the winter, and in the course of the subsequent summer-heats might undergo decomposition, and the carbureted hydrogen gas, as a product of the decomposition, be evolved. This proposition, however, is untenable, as~' it is very improbable that the vegetable matter would be carried so far under the lake before it was deposited; and besides, by percolation through the sand, all the alluvia must have been removed, and consequently no carbureted hydrogen could be obtained from this source. The most probable hypothesis certainly, it appears to me, is, that the elevation of the stratum is owing to the sub-pressure of elastic fluids; and that carbureted hydrogen is the principal is evident, from the copious disengagement of this air, upon perforating the mass, immediately under the surface, with a long pole.

"Carbureted gas" can be any of several gaseous hydrocarbons, but is most likely to be mostly methane.

The question of the greatest difficulty certainly is, how this gas can be accumulated in sufficient quantity to buoy up the mass; the most probable cause seems to me to be the following: -- we know that in ditches and ponds of stagnant water, during the heats of summer and autumn, a quantity of carbureted hydrogen is disengaged, as is evident hum passing a candle over the surface of the water, when the gas immediately takes fire and burns perceptibly with a bluish lambent flame. This circumstance, from analogy, we may apply to the elucidation of our subject -- the carbureted hydrogen gas, then, arising from whatever cause, from the adjacent earth, is detained from reaching the surface by the super-incumbent stratum, and gradually in this manner accumulated. During the summer and autumnal heats, however, by expansion, the gas offers so much resistance to escape as to elevate the detached extremity of the stratum above the surface, and consequently to allow of its gradual disengagement: the stratum then sinks by its own specific gravity, till by a similar accumulation the same occurrence is repeated.

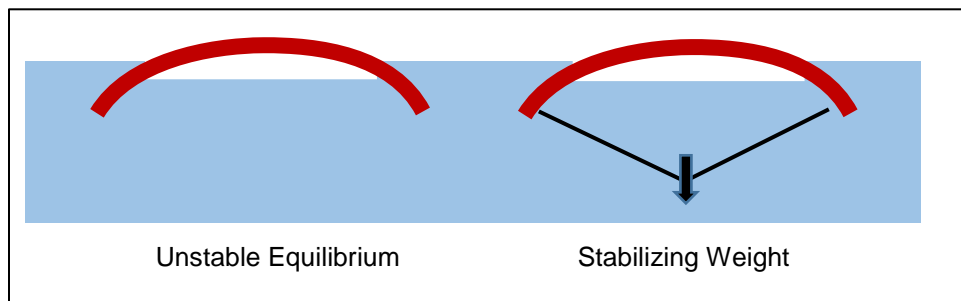
Critique by Alphabeticus, 44:4 (November 1817) incorrectly asserts that the island floats because of air trapped beneath it, as beneath an inverted saucer)

Had your ingenious theorist, Philos, considered a little longer on the subject he has so well treated, he would, I doubt not, have completely elucidated the extraordinary appearance of the

"floating island," for he has, doubtless, shown the power which forces this mass to the surface; but he has not, to my satisfaction, explained the application of it. He says,

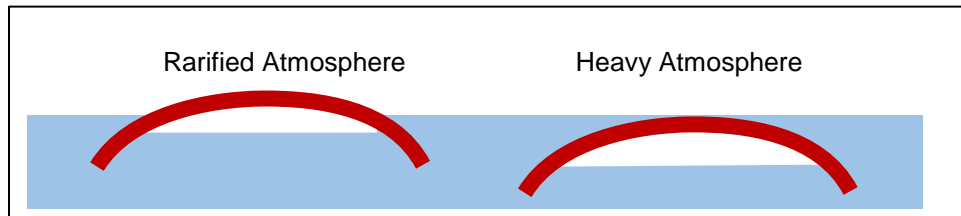
"The question of the greatest difficulty is, how this gas can be accumulated in sufficient quantity to buoy up the mass."

This does not appear to me so difficult of solution, when it is recollected, that, in addition to the roots of plants, (for I am fully persuaded of their powerful agency.) there generally is a large quantity of extraneous ligamentous matter in this very porous species of land—a circumstance highly demonstrable in the bog-earth, either of Ireland or Scotland, whom very frequently are found large portions of charred wood: this aggregated buoyant matter, assuming, as may be easily imagined, reticulated texture, permits the accumulation of gas generated from below, (and wry likely partly from within) and, the density of the earth at the surface not permitting the easy escape of the air, it floats as a reversed saucer would in a bowl of water, from the impossibility of the disengagement of that portion of air betwixt the surface of the fluid and the upper and inner surface of the saucer.



The inverted saucer is a tenuous analogy, however, because the configuration represents at best an unstable equilibrium. Slight perturbation will allow the air to escape. If, however, a stabilizing component were added, the saucer would fare better.

But how is the occasional elevation of this island to be accounted for? I consider that the gas, which from time to time has been collecting, is at an time sufficient to float that mass of earth in any clearer atmosphere than ours, and that the constant pressure and great resistance offered by our climate, is the reason we so seldom witness the phenomenon; but, when we have a season wherein our atmosphere is more than usually rarified.



I have little doubt but that it will be seen to rise, since, the pressure from above being less, the pressure from below will be proportionally increased; and I think that it will be found on enquiry, that, whenever it has made its appearance, the season has partaken more of the nature of the Italian climate than is usual. Its period of continuance will of course depend on the same causes. Philo has only considered the air as rising from below, and then forcing the island to the surface. Now, it would be difficult to account for the mode of action, unless we offered some method of confining the gas, by which, from its resistance, it might be made effective, as otherwise it would rise by the sides of the earth and escape.

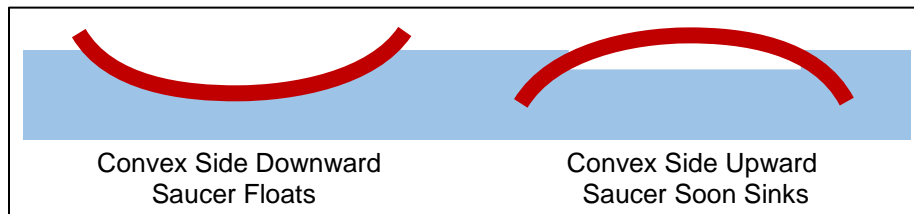
He further objects to the term "floating islands" now, I presume that the term may be applied to everything that, by its buoyancy, is either permanent a locomotive on the surface of any fluid, and it matters not whether that substance be connected or not with the land.

Allow me to remark also, as one proof of my hypothesis being correct, a circumstance in his own paper; he says, "that, on piercing the earth with a long pole, carbureted hydrogen is disengaged" on any other ground than what I have just offered, I see no mode of accounting for this fact, which, I humbly submit, removes any difficulty that might at first sight offer itself on perusing this assertion.

Rebuttal by Philos, 44:6 (January 1818)

With respect to the propriety of the term floating island, which, by the bye, is of very trifling moment, I still maintain the opinion that it is incorrect, or gives an erroneous idea of the subject; and I believe in this I shall be borne out, by philosophical consideration of it. A stratum of earth, like the one in question, much specifically heavier than the fluid which surrounds it, and of a flat surface, can never be elevated without external agency; nobody can swim on the surface of a fluid, unless it be specifically lighter than that fluid; or unless, if specifically heavier, the substance be made into the form of a vessel, the cavity of which must be of greater capacity than the bulk of the fluid, equal in weight to the body: in this instance, however, the substance is flat, or rather of a concave form below, and consequently has, besides its greater specific gravity, a decided obstacle to its spontaneous floating, independent of any subter-agency; viz. a great weight of water pressing upon its convex surface, and resisting its elevation.

This we may explain by a very familiar example: a saucer will flout if its convex surface rest on the water, because in this instance, the upper parts of the fluid, I should conceive, press upon the lower, in order that the due equilibrium be restored; and thus the vessel is borne up, the whole of the pressure being applied below, and none above [left-hand, below]; where, if the same vessel be put into the water with its convex side upwards [right-hand, below], it will immediately sink, as here the water can acquire its own level by ascending in the saucer, and no resistance being offered, it sinks by its greater specific gravity; as well as by reason of a weight of fluid pressing on the upper immersed convex edge of the vessel.

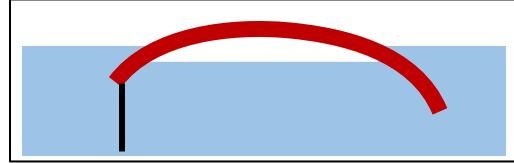


Unlike Alphabeticus, Philos seems to be envisioning alternate an inverted saucer that leaks or is perturbed, either of which will sink it.

The instance of the saucer, Alphabeticus has unsuccessfully advanced as a metaphorical illustration of the manner in which the gas is accumulated: he says, that by means of the "sub-reticulated texture," the earth "floats as a reversed saucer would in a bowl of water;" whereas, the contrary is the case, with regard to the saucer: if the convex part be downwards, it will be supported by the water; but he will find, that if he applies it reversed, it will quickly sink to the bottom.

If the body were specifically lighter, however, in whatever manner it might be connected with the land, when it rested on the surface, we should say, it floated, or if it were of greater specific gravity, but had the bulk increased, as before mentioned; but we certainly cannot say that a heavy substance, as a slate, flats on the surface of water, if it be buoyed up by means of a stake fixed in the earth at one end, and to the under-surface of the slate at the other; and the gas is as much the supporting body in one instance, as the stake is in the other.

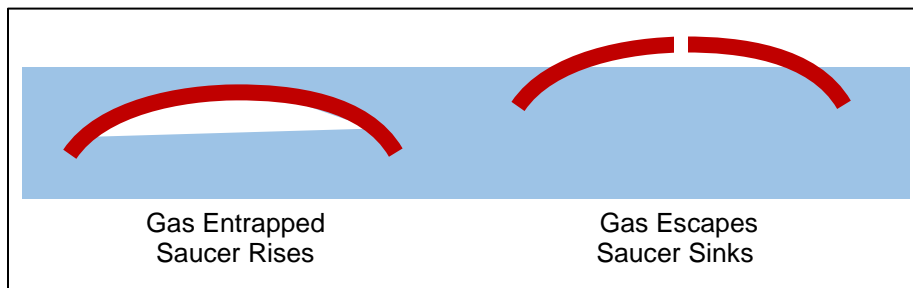
We readily admit that the physical logic is getting beyond us, but perhaps this is the intent.



I have no objection to the theory of Alphabeticus, in supposing, that the under-surface of the earth assumes a reticulated texture; but I do not conceive it necessary to have recourse to it: everyone knows, that, when a stratum of earth is detached from the subjacent pam, an unequal surface is left, with concavities, sufficient to receive and detain a large quantity of gas; besides, when a stratum is elevated, the middle would become more concave, on account of the gas not being able to be detached at the edges; and thus, the supporting power being wanting, they would fall lower than the level of the interior, by reason of their specific gravity being greater than the fluid in which the aggregate is elevated.

There cannot be the least doubt, but that the carbureted hydrogen is contained in separate cavities, as, otherwise, the whole w the most elevated portion, which is not the case. The position of Alphabeticus, that the gas, which from time to time has been collecting, is at any time sufficient to float that mass of earth in any clearer atmosphere than ours, and that the constant pressure and great resistance offered by our climate, is the reason we so seldom witness the phenomenon, I cannot agree to: it evidently takes a considerable time before the air is collected in sufficient quantity to buoy up the mass, and, if there be always a due proportion, why does it not invariably occur when we have a sudden vicissitude from cold to great heat, as is sometimes the case?

When the mass reaches the surface, the pressure of the water is removed from above it, the earth becomes dry, and this, along with the oblique position, allows the escape of the air, when it sinks, by reason of its superior specific gravity; and a length of time is necessary before a due proportion is again accumulated.



A correspondence from "N.Y. of Keswick," 45:1 (1818), subsequently closes the discussion.

Two letters in your interesting Miscellany for May and November last, I have read with avidity, as protesting, to give the solution of a natural phenomenon in this vicinity, I mean the floating island in Derwent lake, concerning which, I have had the opportunity of bearing many conjectures; but must confess, I have been disappointed in the conclusion.

The polite compliments paid by your learned correspondent Alphabeticus, to your prior ingenious correspondent Philos, might, I think, with equal propriety be returned to himself; for, had he considered a little longer on the subject, he would probably have accounted for its occasional elevation in a more satisfactory manner, than by the rare faction of the atmosphere. I know not how far it may agree with your new theory of falling bodies, that the pressure upwards should be greater, as that from above is lessened: but, I think it is not consistent with the old system of gravitation, which generally considers the ascent of bodies, to be caused by the descent of some other of greater specific gravity.

"N.Y." then cites the findings of Jonathan Otley, who dispenses with the saucer analogy altogether (Chapter 48). From Otley's A Descriptive Guide to the English Lakes; (1825),

On material circumstance has however generally escaped observation: namely, that the air to which the rising of this island has been attributed, is not collected in a body underneath it, but interspersed through the whole mass: not causing it to float "as a reversed saucer would in a bowl of water," but by enlarging its bulk, and thereby diminishing its specific gravity.

Fuller's Floating Folly

Buckminster Fuller's floating islands (Chapter 70) weren't confined to the sea. Noting that as a sphere gets larger, its volume grows faster than the area of its surface, Fuller suggests that the mass of a mile-wide geodesic sphere would be negligible compared to the mass of the air trapped within, and if the air inside were even a single degree higher than the ambient temperature, the sphere could become airborne.



Rudimentary physics disagrees, however.

First, the skin or shell that holds the system together does so by means of internal stress. For a sphere of radius r having a thin shell of thickness t , pressurized (relative to the ambient surrounding) to P , the stress σ in the shell is $Pr/2t$, which is to say that the stress varies with r/t . Given the allowable stress for the shell material of a sky city and the pressure differential, the required shell thickness is thus $Pr/2\sigma$.

The ratio of the shell's volume to the volume enclosed within it is $3t/r$, which can be rewritten as $3P/2II$. A spherical sky city, big or little, having a shell of a given internal stress will have the same proportion of shell volume to enclosed volume, which translates to the ratio of gravitational to buoyant forces. Its "floatability," is not changed. Bigger is not better.

Secondly, the buoyancy calculations. Fuller doesn't mention humidity, but as moist air is less dense than dry air, we'll allow Fuller's sky city a 90 percent relative humidity and the ambient atmosphere, 10 percent. We'll take our standard temperature to be the conventional 70 degrees Fahrenheit. The weight of a 1-mile diameter sphere of air, 1000 feet above sea level, is,

Weight of 1-mile Air Sphere (tons)	Relative Humidity (percent)	
	10	90
Temp (F)		
70	715	709
71	713	708
220	531	379

As the 1-degree-warmed, moist sphere weights 7 tons less than does the drier air it displaces (715 less 708), it will uplift if its skin weighs less than that. Fuller does not specify what will enclose his sky city, but we can assume some sort of super-membrane. Were the film the weight of newsprint, it would weigh about 400 tons, a problem which we'll ignore. What remains of the 7 can be used to build the city within.

Raising his temperature differential to approximate the conditions in a hot air balloon -- the gas temperature exceeding the boiling point of water -- achieves slight improvement in physical plausibility, but still not enough to haul up a city. The scalding gas generates a total uplift of 184 or 336 tons by our table,, depending on humidity, still not much for a city, and we'd have to be thermophiles to partake.

Guano

We might want to watch where we step. The Gems of the East, Sixteen Thousand Miles of Research Travel among Wild and Tame Tribes of Enchanting Islands (1904), by Henry Landor, regarding the Philippines,

Around Bang are numerous other little floating islets, principally made of guano in an advanced state of decomposition, and eventually these, accumulating decayed vegetation, and earth deposited by the wind, will become regular islands.

A Supplement to the Pharmacopoeia (1857), by Theophilus Redwood, instructs us how to determine the specific gravity of guano, but we'll trust the estimate, roughly 1.6, a value that sheds doubt on the stated "principal" constituent of the Bang islands.

On Agricultural Chemistry, and the Nature and Properties of Peruvian Guano (1857), by John Nesbit, adds this.

Dissolve in a quart of water as much common salt as it will take up, and strain the solution. Pour a quantity of it into a saucer or basin, and sprinkle on the surface the guano to be tested. Good guano sinks almost immediately, leaving only a very slight scum.

The year 1857, it seems, was a major year for guano studies.

From "Guano Claims Staked on Floating Island," San Francisco Call, June 10, 1910,

Guano claims have been staked out on the famous Bird islands in Lower Klamath Lake by W.O. Smith and George Harriman. They, will quarry out the guano for fertilizing purposes.

These islands are peculiar, in that they float, rising and falling with the shifting of the water, but do not shift their positions.

The islands are the breeding grounds for millions of birds of many different varieties.

The material's specific gravity may explain why Smith and Hariman's mining claim was not successful.

Sometimes fiction better describes reality than does journalism, as illustrated by Jasper Fforde's Shades of Grey: A Novel.

Rumor speaks of a floating island somewhere on the oceans which is actually lived upon, but you'd need several thousand cubic meters of the stuff to have any chance of supporting a settlement, More than likely it'll be a home for seabirds and the like -- until the weight of the guano pushes it beneath the waves.

In Greece, we have a more believable floating island, one guano rich, but buoyed by lighter substructure.

Floating islands made of reeds, other aquatic vegetation, willow branches, silt, and bird guano dot the northern and southern ends of Lake Mikri Prespa in Greece. Six of the 42 reed-bed nesting sites used by pelicans between 1984 and 1996 broke away and drifted to other parts of the lake. Four of the nesting sites were thought to have floated from a nearby reed-bed.



CHAPTER 20

ADDRESS THE REST OF THE PHYSICS

This chapter likewise pursues physical principals, but principals other than ones directed to questions of buoyancy. We'll again concentrate on quantifiable estimates, though we'll leave those where the math becomes complex at more of a conceptual basis.

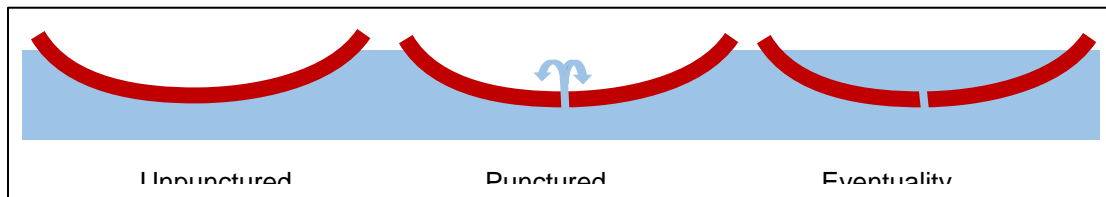
Bernoulli's Law

Bernoulli's Law is one of energy conservation in which a fluid's total energy can be subdivided into components of pressure, velocity and elevation. Unless energy is added, say by a pump, in an idealized world without friction and other energy losses, the total of the three remains the same. The total decreases over time in a non-idealized world.

An application to floating islands relates to "spouts" when the island is punctured, an example found in "The Next of Kin," Temptation and Atonement, and Other Tales (1847) by Mrs. Gore (Catherine Francis).

And who would ever have dreamed, on overhearing my quotations from Moore and Byron, or the graphic account afforded by Agnes of the appearance of a floating island in Gleyburn Mere, from the turf of which, when pierced, issued a jet of water as high as the geysers of Iceland, that the heart of each was throbbing with emotion -- that both were conscious of being on the eve of waking from a dream, too sweet, too bright to last!

As the allusion is to a dream, we'll not fault the author for physical improbability, but such a spout would have required the island to be bowl shaped, depressed least the height of the eruption, tens of meters being common in Iceland. Such a perforation would soon fill the entire bowl.



Spouts can occur when a pressurized waterbody is opened, an artesian aquifer or confined thermal waters being examples, but in such cases, the confining strata wouldn't be called an "island."

Circular Shape

Pliny the Younger (Chapter 32) correctly explains the circular form of floating islands as the product of abrasion.

The edges of all of them are worn away by their frequent collisions with the shore and one another.

During each collision, a small fracture of the island gets lost at the point of contact. If the floating shape is to some degree plastic, the circular shape can as well be the outcome of packing.

Though our intuitive agreement is suffice, the question's been more formally addressed by W.J., Firey in "Shapes of Worn Stones," Mathematika 21 (1974), in which a closed, convex plane curve S repeatedly collides with a straight line S^* . The only possible limit shape of the curve (after scaling) is a circle,

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Below, four photos of Lake Turnalar, Turkey (Chapter 38) showing repositioning. The islands round their edges as they collide against one another and the bank.



A few more examples



Kamulondo Depression, Zaire



A well rounded floating island near Turkey's Altıparmak Mountains



Rio Parana. Paraguay. 150-meter island in prehistoric artificial pond



Zakaton, Mexico. 16 islands, 3 to 10 meter diameter

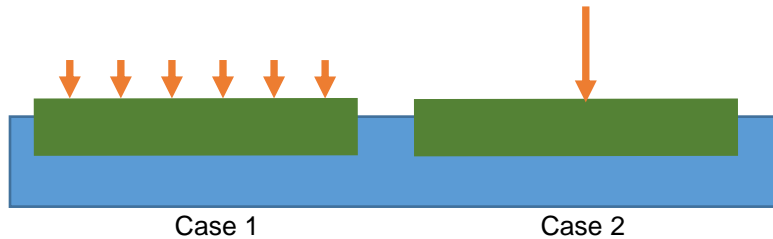
Double Bottoms or No Bottoms

If someone hadn't raised the possibilities, Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge (1839) wouldn't have commented.

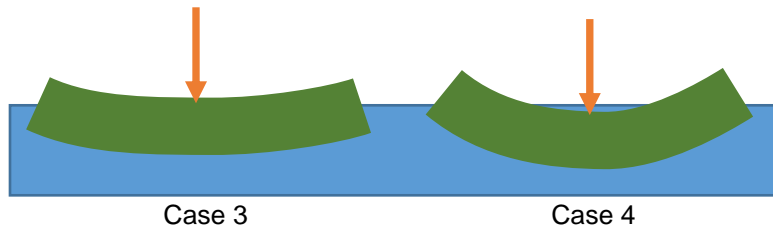
Some subterranean lakes are supposed to have become so by the formation and subsequent fixing of floating islands, which successively uniting have finished by forming a solid crust over the water. Some lakes have a double bottom, which rising and sinking alternately changes the apparent depth of the lake; there is a lake of this kind at Jemtia in Sweden. Some lakes are said to have no bottom, but this is an impossibility.

Flexure

We kept the buoyancy model simple by assuming our island to have a uniformly-distributed external load of W per unit area, Case 1 below. If the island were rigid, e.g. a brick of pumice, and loaded at a particular point with a weight equaling the same total, Case 2, *Sub* would be the same. If the point load isn't at the center, the island will tilt and float to the same net degree, not a difficult computation, but one we'll not pursue.



An island largely consisting of plant matter, however, is by no means rigid. If its flexibility is slight and the load not too large, the island will sag as illustrated as Case 3, none of the top surface depressed below the water surface. *Sub* simply takes on the meaning of mean submergence.



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If the island is sufficiently flexible, a portion of the surface may be pushed completely under water. If the total load is the same, the buoyant counter-force is likewise the same, which means that the volume of displaced water (the area of the cross-section below the water surface, per Archimedes' Law) is unchanged.

Once a portion of the island is submerged, further submergence of that portion adds nothing to its buoyancy. Pulling additional encircling area below the water surface, however, creates additional buoyancy, and to maintain equilibrium, will cause a compensating lifting at the island's edges, Case 4.

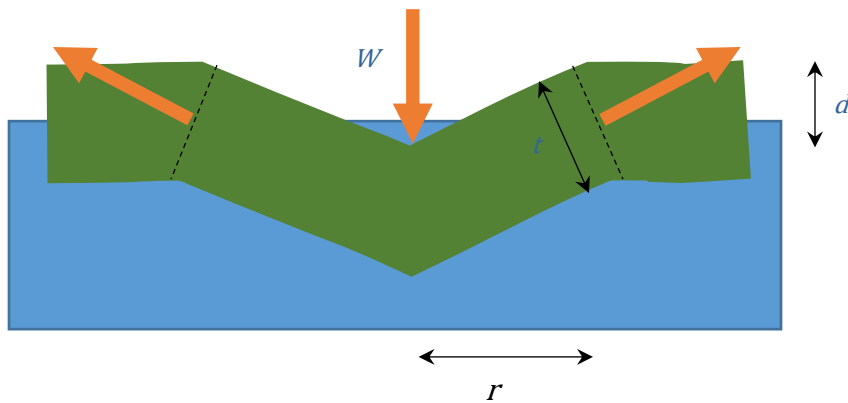
The system's overall *Sub* is still the same, but not the local consequence where the load is applied. In practical terms:

A floating island's overall buoyancy does not depend on its flexibility.
 One's feet can be submerged when standing on a floating island,

We'll note some wet feet in Chapter 37.

Strength

As floating island is thin and typically of material weak in tensile, a point load may punch through the structure. Consider a floating mat of thickness t in which a point load W causes a conical depression of radius r and depth d .



The inclined arrows represent the material's tensile reaction, the pull on the no-longer horizontal fibers. Balancing forces in the vertical, tensile stress (force/unit area) within the material is,

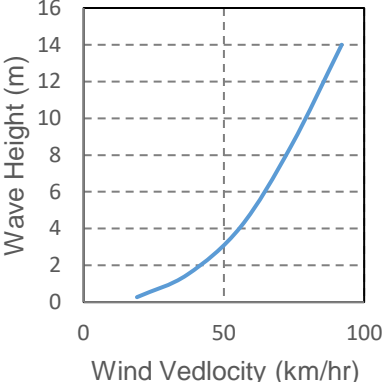
$$\sigma = \frac{W}{\pi r d t}$$

If σ exceeds the material's tensile capacity, W punches through the island.

Stress increases with load and decreases with thickness and distance from the load, all expected results. That tensile stress decreases with depression depth may seem counterintuitive, but the steeper the sides of the sag, the less the pull on the fibers.

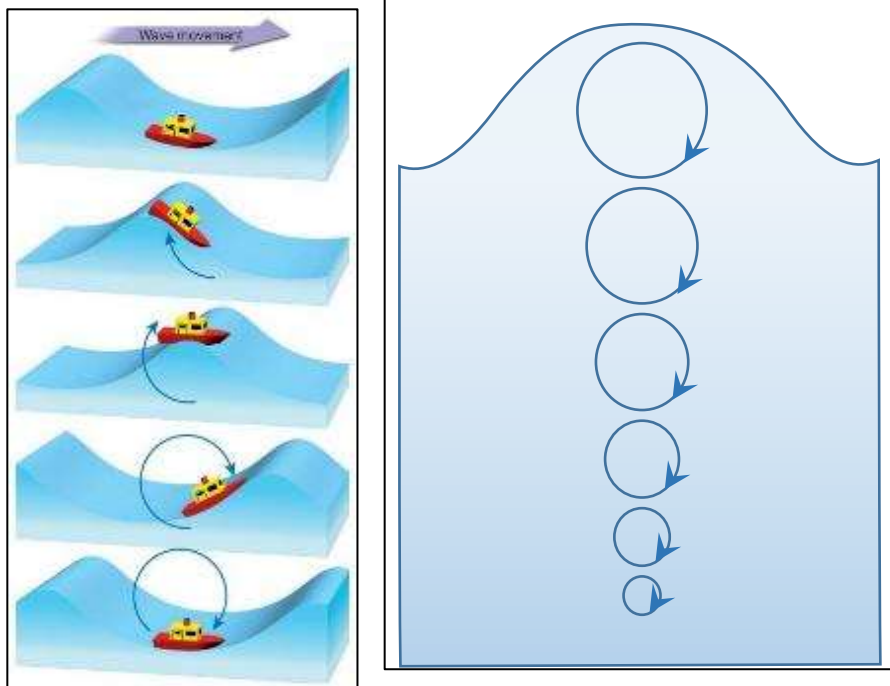
Water waves can result from a variety of physical conditions. We will confine our discussion to the impact of semi-regular oscillations of significant magnitude on the free surface of relatively-large water bodies as the result of wind. We're not considering the impact of a tidal wave.

Rules of Thumb for Ocean Waves

<p>Wave height, the vertical distance between trough and crest.</p>	<p>Wave length, the horizontal distance between crests</p>
	$Wave\ Length\ (m) = \frac{[Wind\ Velocity\ (km/hr)]^2}{41}$
	<p>Wave period, the time interval between arrival of consecutive crests at a stationary point</p>
	$Wave\ Period\ (sec) = \frac{Wind\ Velocity\ (km/hr)}{6.5}$
	<p>Wave velocity, wave length divided by wave period</p>
	$Wave\ Velocity = \frac{Wind\ Velocity}{1.8}$

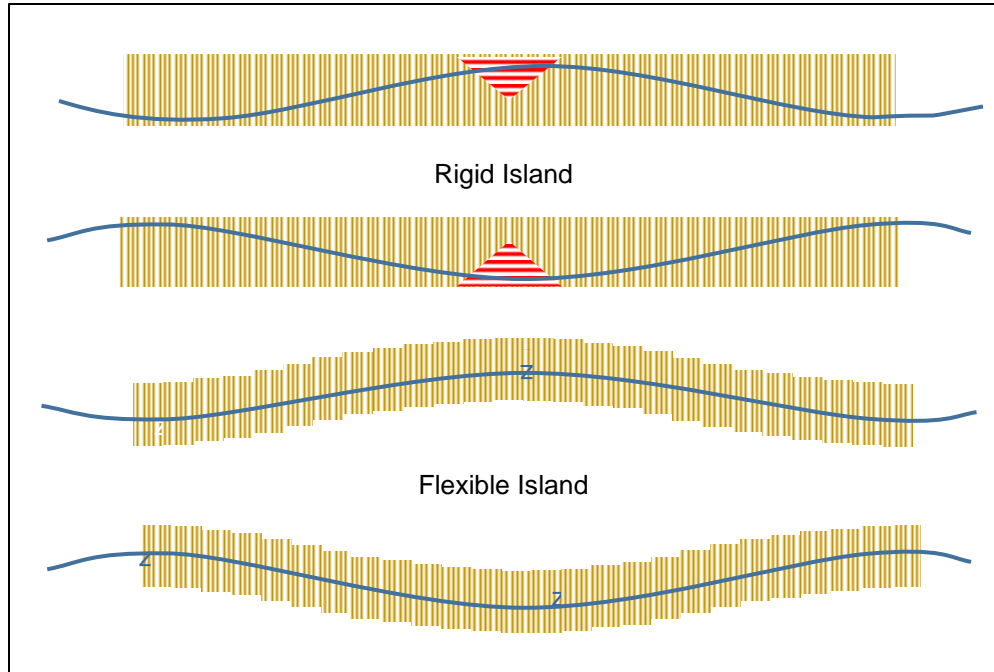
A wave in the deep sea is not a mass of fluid racing along the surface. It is a pulse of energy transmitted from one water particle to the next. The water particles, themselves, travel relatively little in an elliptical circuit once per wave period.

Below left: The fluid's elliptical orbit as a wave passes. Below right: The decreasing orbital magnitude with depth.



In the first two figures below, tensile stress indicated in red illustrates the manner in which passing waves flexes the midpoint a brittle island, leading to material fatigue. In the lower two figures, the flexible island reduces the flexural problem, but with the consequence of a rippling surface.

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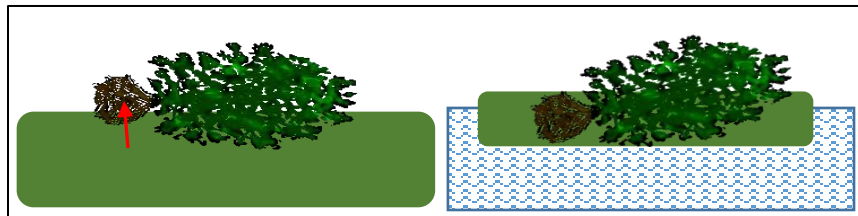
Trees as Sails

Trees-as-sails occur in multiple floating island observations.

A 14-knot wind exerts about 1 pound/square foot of pressure on a sail. For a tree 15 feet high and 5 feet wide, that's a 75 pound push. How rapidly such a force can propel an vessel, be it sailboat or floating island, depends on the vessel's drag, obviously greater for an island than a ship's hull. The requisite mathematics are familiar to nautical designers, particularly those optimizing racing yachts, but not our interest.

We're concerned with the vertical stability of the tree, whether or not it will topple.

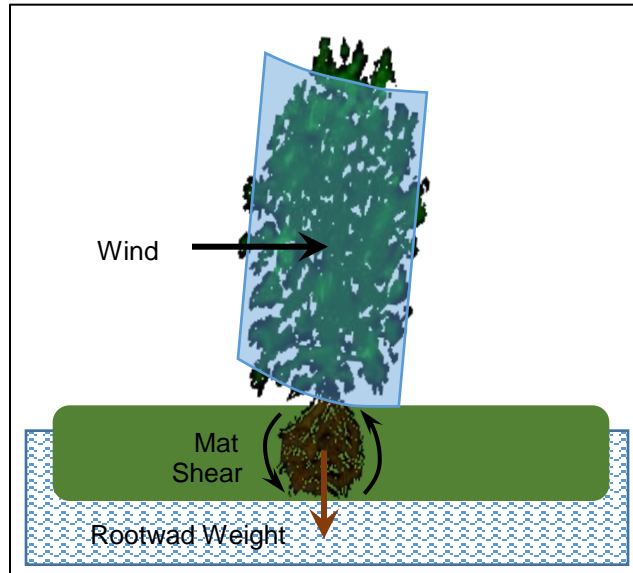
A storm-felled tree on land generally pivots at ground level, lifting a portion of the roots into the air. If the roots are in a thin floating mat, the integral tree and rootwad structure more likely rotates about the wad's center.



In our simplified illustration, 750 foot-pounds (the product of the 75-pound force and its assumed 10-foot moment arm from the rootwad center) is the torque that the rootwad must counter.

A 15-foot tree in a terrestrial environment might have a 500-pound rootwad. Within a floating mat, however, the effective weight of the wad is reduced by the weight of the displaced water. As interstitial soil may have been washed away, leaving woody material with a specific gravity near 1.0, the contribution of wad counterweight against tree-tipping will be slight.

Shear resistance from the engulfing mat, not root mass, is what keeps the wad from rotating. The more toughly intertwined the mat, the more counter-torque can be provided. In our example, a mat having 4 pounds/square foot of shear strength should hold the tree.



The moment arm, and thus the tipping torque, increases as the tree becomes taller. As the wind force (albeit drag or momentum) increases with the square of velocity, doubling the wind speed increases the required counter-torque by a factor of 4. At some point, the mat can't provide sufficient rotational resistance and the tree will topple.

Scores of reports mention 20-foot trees on floating islands.

Trees of 30 feet are occasionally mentioned, an example being a red maple on Ohio's Cranberry Island noted in Proceedings of the Ohio State Academy of Science 4-5 (1905).

Another comes from Wisconsin. Boettcher, Terrell, "Drowning Victim Found Beneath Bog in Flowage," Sawyer County Record, August 11, 2004,

The floating bog, five acres or larger, is located in Kavanaugh Bay east of County Highway CC in the mid-part of [Chippewa] Flowage. The bog is spongy, seven to nine feet thick, with cavernous pockets beneath it, and is covered with brush and trees up to 30 feet high.



Even-taller trees have been documented, but the heights may be visual impressions, not actual measurements.

A larch 45 feet high, 11 inches in diameter, on the floating cranberry bog of Dyking Pond in New York in 1910,

A 50-foot spruce in "Maine's Floating Island," North Adams Transcript, August 8, 1899,

The town of Liberty has a floating island which is quite a natural curiosity. The island contains about 100 acres. It does not float around for the reason that there is not space for it to do so, but it rises 10 or 12 feet during the freshets of fall and spring and falls back to solid pasture land during the drought of summer. Spruce trees 50 feet tall grow upon it.

Another 50-footer, "A Floating Island," Syracuse Herald Journal, May 3, 1953,

A floating island with 50-foot trees on an acre of soil is in Chief Noonday Lake in the Yankee Springs Recreation area near Hastings, Michigan

The record, also from Michigan, appears to be 60 feet.

"Floating islands of Castalia and Carex, Mud Lake, Frankfort, Michigan" Library of Congress American Environmental Photographs, 1891-1936 is most likely modern Lake Dubonnet which came into being when Big and Little Mud Lakes merged in 1956 in a conservation flooding project..



And now for the 60 feet. "Island Still Moving," Traverse City Record-Eagle, November 16, 1970,

A state Department of Natural Resources spokesman said the island came into being when two lakes, still shown on many maps as Big and Little Mud merged in 1956 in a conservation flooding project. Originally two acres in size, the floating land has dwindled in area but still supports tamaracks and other trees reaching heights of 60 feet and diameters of up to 12 inches at the stump.

Observers reported recently that the island passed a given spot on the mainland five times in a short period of time, and fishermen have told of suddenly becoming aware the timbered mass was bearing down on them. A couple of years ago, Grand Traverse County board of commissioners tried to have the lake renamed "Floating Island." The DNR said, however, that the day will come when the island will cease to exist, so the board settled for Dubonnet, a name once given to the merged Mud lakes but not then officially recorded.



The acre-sized island (right portion of the picture) had drifted to within some 50 feet of a public access-boat launching area (left side of the photo) at the southwest shore of the lake.

From Minnesota, "Storm Effects Linger in Cass," Brainerd Daily Dispatch, August 19, 1999,

Two acres of bog in Boy Lake has drifted free. It contains two large pine trees that act as sails.

A follow-up, "Grant to be Sought for Private Sewer Systems," November 3, reports arrangements to have the sailing bog tethered to shore.

"Wandering Island Raises Questions," Traverse City Record-Eagle, August 6, 1971,

Located northwest of Initerlochen, the island in question is one that has a very unusual habit. It floats all over the lake.

For fishermen it becomes a particularly unnerving sight when the 1-1/2 acre island, complete with trees and brush, comes bearing down on them ahead of a stiff breeze. It is quite understandable when they decide to split the scene in a heck of a hurry.

Or, imagine the reaction of a cottage owner who watches the sun set over his lovely watery view but wakes up the next morning to find nothing out front but a wail of trees and brush.

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The suggestion has more recently been made that since almost nobody calls it "Lake Dubonnet," the name be changed to "Floating Island Lake."

The idea, while greeted with enthusiasm by some, has failed to stir the proper authorities. They feel the island might someday sink and then the lake could come to be known as just plain "Island Lake," of which there are also already too many in Michigan. There are no other Floating Island Lakes, though. While the big flap continues over the name of the lake, the big island continues to contentedly sail back and forth to all corners of the lake at the whim of the wind.

Aside from being nervous about such unusual behavior of the island, private property owners on the lake have begun to voice another concern:

What if the tax assessor comes around when the island happens to be resting on somebody's beach? Does the extra 1-1/2 acres of land go on that person's tax bill? So far nobody has answered that question even though taxes still seem to keep going up. (For the record, everybody else's taxes are up, too.)

Another question concerns township ownership of the island. Does it belong to Long Lake Township or Green Lake Township or both? The wind frequently carries it from one to the other since the township line happens to cross the lake.

Dubonnet's floating island is mentioned in "Fishing Interlochen's Lake Dubonnet," March 4, 2008, by Emily Bingham,

And don't forget to paddle past the lake's marshy, pine-dotted "wandering" island. Local lore claims it's the world's only floating island; while this may or may not be true, the drifting land mass is still worth a look-see.

"Lake Dubonnet," Northern Express, April 5, 2010,

There's even a floating island.

What doesn't seem to be reported since the 70s, however, is the tall trees' mobility. In all likelihood, the acre-sized chunk of Upper Michigan forest has attached itself to the shore and is now subsumed in Dubonnet's dense lakeside woodlands.

Velocity

We begin our discussion of island velocity with an illustration of minimal mathematics: "Floating Islands: A Mode of Long-Distance Dispersal for Small and Medium-Sized Terrestrial Vertebrates," Diversity and Distributions 4:5/6, September 1998, by Alain Houle.

The effect of wind on floating islands is complex to evaluate. Among the factors to consider, there are winds velocity and circulation patterns, currents velocity and circulation patterns, the positive effect of wind on the crowns of trees and all other organic and inorganic materials present on the island, the size and mass of the island, the degree of buoyancy of the entire floating mass, water density, the Coriolis effect, the negative effect of water resistance on the submerged base of the island, and so on.

Until all these parameters are understood, the effect of wind on the velocity on a floating island has been estimated as follows.

Because water resistance on the submerged base of the island is probably important (increasingly important as the velocity of the island increases) and because winds are not always blowing optimally, the efficiency of the additive effect of wind (as a pulling force) is assumed, as a rule of thumb, not to exceed 25% (Paul Guimond, engineer, and Jean Malouin, experienced sailor, pers. com., 1998). In other words, three quarters of the wind energy is lost because of these two limitations-one should note that sailboats are much more efficient in their use of energy (i.e. in their aerodynamics and hydrodynamics) than floating islands. Therefore, the velocity of a floating object is equal to:

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$$Velocity = \frac{Stronger\ Velocity - Weaker\ Velocity}{4} \pm Weaker\ Velocity$$

which is translated for our purpose into,

$$Velocity = \frac{Wind\ Velocity - Current\ Velocity}{4} \pm Current\ Velocity$$

The current velocity is added or subtracted,, depending whether the direction of paleocurrents was the same (addition) or the opposite (subtraction) than the direction of paleowinds.

While the author, an ecologist, can't be expected to be astute in fluid mechanics, his personal communication from an "engineer" and an "experienced sailor" falls below any standard of citation. Let us pursue.

F.L. Burns, J.F. Moresby and J.A. Peterson, "The Floating Islands of Pirron Yallock, Victoria," Australian Society of Limnology Bulletin 10 (1985) propose a floating-island velocity calculation, but the underlying hydrodynamics are questionable and the citation of "Ice-Push Ramparts in the George River Basin, Labrador-Ungave," Arctic 19:3 (1965) contains no supportive content.

We may be better to build a model from scratch. Let us begin with a simple force balance on a wind-driven floating body.

$$F_{Da} = F_{Dw} + F_b$$

where

$$F_{Da} = \rho_a C_{Da} A_a (V_a - V_i)^2, \text{ drag force from air}$$

$$F_{Dw} = \rho_w C_{Dw} A_w V^2, \text{ resisting drag force from water}$$

$$F_b = \text{Resisting force from root entanglement in bed. 0 when roots disengage from the bed}$$

$$\rho_a = \text{Mass density, air}$$

$$\rho_w = \text{Mass density, water}$$

$$C_{Da} = \text{Drag coefficient, air}$$

$$C_{Dw} = \text{Drag coefficient, water}$$

$$C_D = \left[k / \ln \left(\frac{z_r}{z} \right) \right]^2, \text{ drag coefficient}$$

$$A_a = \text{Area of island top and unsubmerged banks}$$

$$A_w = \text{Area of island bottom and submerged banks}$$

$$V_a = \text{Air velocity}$$

$$V = \text{Island velocity}$$

$$k = \text{von Karman constant (0.4)}$$

$$z_a = \text{roughness length, island top (e.g., 15 cm for 60 cm grass)}$$

$$z_w = \text{roughness length, island bottom (e.g., exposed roots)}$$

$$z_{ra} = \text{reference length, island top}$$

$$z_{rw} = \text{reference length, water}$$

Both the wind and water forces result from fluid friction, not pressure. While journalists are prone to speak of an island tree acting as a sail, the predominant effect of the vegetation is that of

providing the wind more features by which to drag the body along. A flat floating cloth can be drug by passing wind.

If F_b is minor,

$$\frac{V_a}{V} = \frac{\ln\left(\frac{z_a}{z_{ra}}\right)}{\ln\left(\frac{z_w}{z_{rw}}\right)} \sqrt{\frac{A_w \rho_w}{A_a \rho_a}} + 1$$

which says that island speed is directly proportional to wind speed.

Below are z_a estimates from Surface Roughness Lengths (1992), Frank Hansen, Army Research Laboratory TR-61. The values are less than plant height because roughness is due to only branch protrusion into the passing air flow.

	z_a cm		z_a cm
Short grass	0.14	Thick grass, 50 cm high	9
Sparse grass, 10 cm high	0.7	Thick grass, 60 to 70 cm high	15
Thick grass, 5 to 6 cm high	0.75	Brush, scrub growth, open	16
Level terrain, low shrubs	2.6	Field, scattered trees, hedges	25
Grasslands, 18 cm high	2.7	Brush, scrub growth, dense	25
Uncut grass, isolated trees	3	India, trees, 13 m high	29-34
Grass and trees, mixed	3.5	Fairly level wooded country	40
Semiarid, sparse brush	5	Forest clearings, cutover areas	40
Sparse grass, 50 cm high	5		

To estimate z_w involves diving underneath the floating island, not an easy task. "Evaluation of Floating Wetland Islands as a Retrofit to Existing Stormwater Detention Basins," World Environmental and Water Resources Congress (2012) by R. Winston, W. Hunt and S. Kennedy, documents roots hanging 60 centimeters, but the effective value would likely be less.

Reference lengths z_{ra} and z_{rw} are arbitrary boundary conditions.

As the right hand side of the V_a/V equation contains site-specific parameters difficult to individually estimate, the pragmatic naturalist need only measure island and wind speed to discover the proportionality.

If F_b is minor, island velocity generally tends to be a few percent of wind speed. If there is a water current, that effect is simply added to the above.

Burns et. al. (1985) mention an unspecified island observed to progress 18 meters in 5 minutes ($V = 0.06$ meters/second). V_a is not specified and z values are uncertain, but if a heavy breeze is assumed, the observed speed falls within the range of estimates by our method.

Or taking an entirely different approach, we might look at "Island Was Afloat," Hackettstown Gazette, August 18, 1922.

The Mississippi had just reached flood stage and I was just above Vicksburg, Miss., paddling along at a good rate of speed on a canoe trip to the gulf, when I noticed ahead, about half a mile distant, a small island. I set it as my objective, figuring it a dandy spot to disembark to prepare my noon lunch. Paddling more quickly, I was surprised that it required almost an hour to reach it. When I did. I found it to be a floating island, detached in some manner from the mainland. It was about 250 square feet in area, and upon it were three trees of good stature. I

rode along with it (at a safe distance), and when I made camp, six hours later, it was still on its way to the gulf.

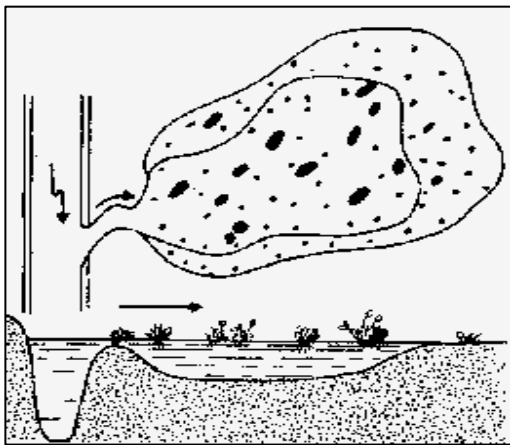
The paddler needed almost an hour to close the half-mile gap, a relative speed of roughly 0.25 meters/second. Most canoers in calm water average somewhat less than 2 meters/second over a day's effort. Had our paddler been doing, say 1.75 meter/second, the island must have been pushed 1.5 meters/second by a northerly wind.

U.S. Army Corps of Engineers gaging of the Mississippi at Vicksburg indicates that at near-flood stage, the river velocity at the water surface is about 1.3 meters/second, but as the paddler and the island were in the same current, the value makes no difference to their race.

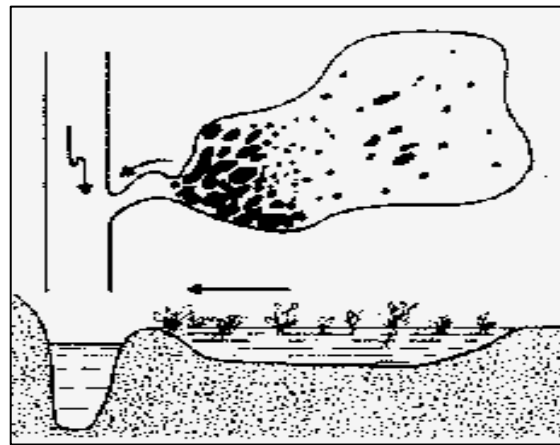
Does a wind-push of 1.5 meter/second seem reasonable? We'd need to do some fieldwork on the Mississippi to know, but the value seems realistic.

Hydrologic Impact

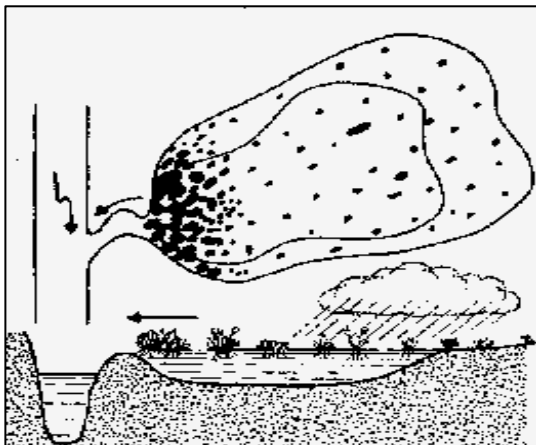
Consider the release mechanism for floating vegetation dammed during the flood cycle:



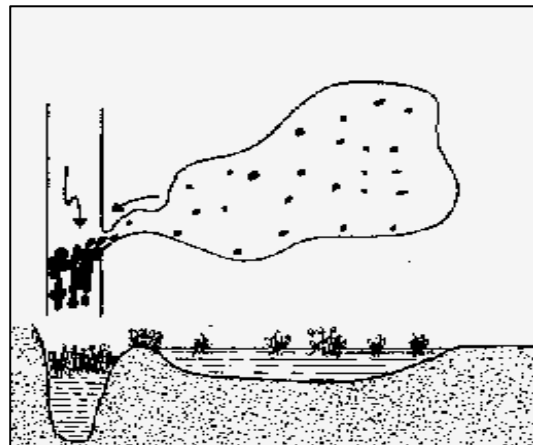
(A) Ponds impounded in flood stage



(B) Impeded dispersal of vegetation after-growth



(C) Similar situation during the rains,



(D) Vegetation breakthrough into river.

Within the canal outflowing from a lake in Varzea floodplains of Amazonia, there have been periods of continuous passage of at least 30 islands per day, with a combined surface area from 100 to 1,000 square meters.

The sporadic -- a modern interpretation might even use the adjective "chaotic" -- behavior of floating islands has long been recognized. As noted by Bernhardus Varenius in Geographia Generalis (1671),

Why don't they swim now? The answer is easy; the floating cannot hold out, for they reaching near the bottom and being carried from one place to another, they meet a sand-bank and settle there, especially if they come between two sand banks, then they join and become fixed.

After drought in the late 1990s had dried the shorelines and wetlands of Florida's Tsala Apopka marsh/lake system, rising water in 2003 lifted vegetation and small trees to the surface, bringing with them 2 to 3 feet of peat and mud. Nearly 300 acres of floating islands blocked navigation until the winds shifted.

Impact of floating islands on the hydrologic system is seen worldwide. Sudd break-up (Chapter 22) regulates the hydrograph of the White Nile. The embalsados of Lagunas del Ibera Ramsar, Argentina (Chapter 28) act as a valve controlling the throughput of water

Accretion and Avulsion

The Faerie Queene (1590) by Edmund Spenser, a work we met in Chapter 2.

*For though the sea, with waves continuall,
Doe eat the earth, it is no more at all,
Ne is the earth the less*

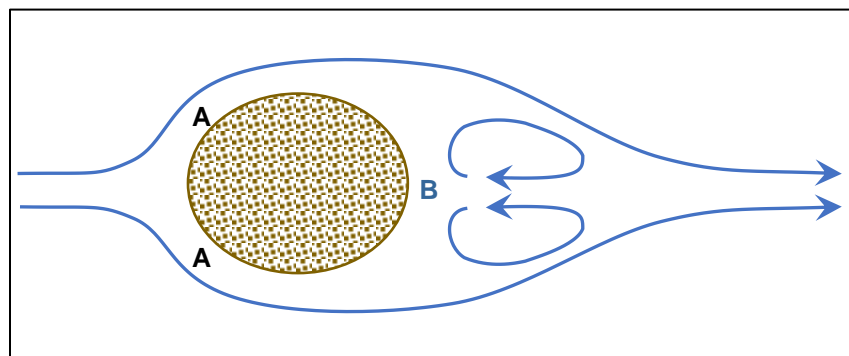
"Accretion" is the gradual deposition of soil through the natural washing up of sand, silt or soil so as to form firm ground, called "alluvion." The latter term is more properly applied to the deposit itself while "accretion" denotes the act; but in common practice, the two terms are used somewhat interchangeably.

"Reliction" is dry land formed by the withdrawal of water from the shores of a river, lake or sea, e.g., a twin channel stream in which one channel enlarges sufficiently to cause to become a waterless relic.

"Erosion" is the opposite of accretion. It is the gradual eating or gnawing away of soil by the operation

"Avulsion" refers to the sudden and perceptible transmission of a significant quantity of soil from one site to another. Avulsion is sudden; accretion, reliction and erosion are gradual.

Fixed islands can appear to move, the net of erosion at one location and deposition at another. The figure below of streamflow around an island illustrates the process.



When a channel is constricted by an island, the discharge has less width in which to flow, and thus increases in velocity, subjecting alluvium at points A to additional erosion. Over time, the upstream banks of the island wear away. Once past the island, the waterway recovers its effective width and velocity lessens, increasing the propensity for suspended to settle. As the streamlines don't immediately converge, a zone just below the island's lee becomes a semi-

quiescent wake. The bypassing streamlines on either side may, in fact, induce the double vortex illustrated, which returns sediment against the island's downstream side. The net effect is a degrading at A and aggrading at B.

Few alluvial islands simultaneously aggrade and degrade at corresponding rates, but when the rates aren't too different, to an observer at a fixed point on the shore (and with a lot of time to spend), such an island might appear to be "floating" to a new position. We'll see an example in Chapter 55.

North Holland's Wadden Islands developed when the sea current began to run more parallel with the coast, giving rise to a series of low-lying dune ridges, and subsequent marine incursions eroded the peat behind the ridges. One of these islands, Schiermonnikoog, 50 square-kilometers, has been "moving" due to erosion on the north-west end and deposition on the south-east.

Since the mid-13th century, Schiermonnikoog has migrated roughly 2 kilometers southward and 3 eastward, illustrated by the overlay from Gerard de Jode's Speculum Orbis Terrarum (1578). The script is inverted because the de Jode oriented south to the top.



In 1717 the island's church had to be relocated, a short-lived fix, however, as the edifice came under renewed threat in 1760. The third church, built in 1762, has lasted to the present.

Earl of Zetland v. The Glover Incorporation of Perth (1870) dealt with fishing rights belonging by special local usage to the riparian proprietors along the Scottish river Tay. A "drifting island" -- what we recognize as an accretion -- led the Earl of Zetland, a riparian landowner, to claim that because the island was nearest to his side of the river, his fishing right was now the middle thread of the branch of the river between the island and the opposite shore.

The Court of Sessions, however, deemed that the migrant island was part of the riverbed, and that the channel's middle thread remained centered between the original banks.

As matter of law, in respect that the said bank... is not altogether stationary, or truly in the sense of the law of the character of an island situated within the bed of the river, but is truly a portion of the bed of the river, liable to be affected and moved from time to time by the action of the fresh water floods or of the sea-tide, that the same cannot be regarded or dealt with as an island capable of permanent appropriation by the proprietor or proprietors of the shore on either side of the river, but must be dealt with as being truly within the bed of the river, the fishing of or from which is to be divided so as to afford to the respective proprietors on either side thereof the possession of the fishing to the medium filum of the river as the same exists at low-water.

The Sea (1995), by Angelo Rappoport, describes another instance of accretive "floating."

Many Norwegian traditions relate to floating islands. Far away in the open sea, in the straits of Helgoland, there is a small sand-bank called Sandflossen; it is an excellent place for fishing, but is difficult to be discovered, because it is floating from one place to another. This sand-bank was not always situated at the bottom of the sea. In times of yore it was an island in the possession of a rich peasant of Helgoland who had built there a hut to shelter himself in the summer. Fishermen and mariners pretended that they had often heard sounds of laughter and

of music and all sorts of noises coming from the sand-bank, which from time to time emerged from the sea like a charming island.

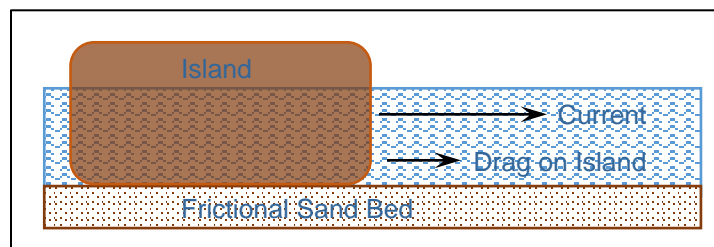
The role of erosion, of course, can be over-estimated. Yoshioka, K., "Structure and Development of Plant Communities in the Ozegahara Moor," Ozegahara: Scientific Researches of the Ozegahara Moor (1954) argues incorrectly that the floating islets were formed by erosion of the bases of non-floating islands.

Sliding

"Floating Island in River Claimed by Warren," Salamanca Republican Press, March 10, 1945 deals with Warren, Pennsylvania. Whereas the "sliding" hypothesis is probably incorrect, it's worth mention as a theoretical possibility.

Warren lays claim to a phenomenon -- a "floating island" in the Allegany River. It is the island a short distance above the Glade Bridge. Scores of observers say the whole island -- trees and all -- moved downstream during the crest of the present high water. Estimates of the distance traversed range as high as three hundred feet.

One suggested explanation is that the island is of sand covered with topsoil on which trees and shrubs grow, and that the force of the high water, together with water seeping into the sand, caused the upper part to slide on the sand foundation.



Magnetism

In formulaic appearance, magnetic force appears to be closely akin to that of gravity.

$$F = \frac{\mu q_{m1} q_{m2}}{4\pi r^2}$$

where

F is force (newton)

q_{m1} and q_{m2} are the magnitudes of magnetic poles (ampere-meter)

μ is the permeability of the intervening medium (tesla-meter/ampere)

r is the separation (meter).

But here the respective behaviors part ways. Newton gave basis to the understanding of the solar system, how planets rotate about the sun in equilibrium. Samuel Earnshaw proved in 1842 that it is in fact impossible to suspend a non-moving permanent ferromagnet in space with the sole help of other such magnets statically placed around it. While it is conceptually possible to take each planet to be a magnet positioned in such a way about a magnet sun, that for a split second the solar system would seem to be in equilibrium, the entire configuration will fly apart or crash together.

Earnshaw showed that there is some direction in which there will be an instability, a magnet sitting above a magnetic track won't just float by itself. The forces that are balanced are all trying to pull it out of its "sweet spot." A mechanical constraint is required to keep it stable.

Earnshaw's theorem does not apply in certain conditions.

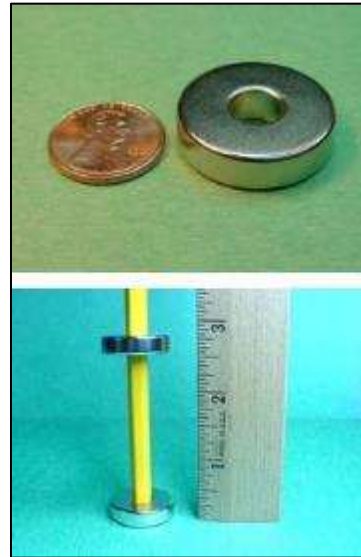
Spinning ferromagnets, such as the Levitron, can magnetically levitate permanent ferromagnets.

Switching the polarity of an electromagnet can levitate a system by continuous expenditure of energy, maglev trains being an application.

Earnshaw's theorem applies to materials having both repulsion and attraction, not diamagnetic materials, those which exhibit only repulsion against the magnetic field. An example of this is the famous levitating frog in which a magnetic field 100 to 1000 times greater than that of household magnets suspends the creature. In such a field, all atoms inside the frog act as small magnets repelled by the large magnet. All materials – including strawberries, water and gold – are diamagnetic to some extent, but some are more convenient to levitate than others. Frogs are convenient not only because they have a high water content, a good diamagnetic material, but also because they easily fit inside a tube-shaped Bitter electromagnet.

A neodymium magnet, the most widely used type of rare-earth magnet, is a permanent magnet made from an alloy of neodymium, iron and boron to form the $\text{Nd}_2\text{Fe}_{14}\text{B}$ tetragonal crystalline structure. One can be tied to a rope and used to drag lakes and streams for metal objects or be bolted to the wall or ceiling to hold tools or other objects.

To the right, an off-the-shelf example, 1-inch outside diameter, 5/16-inch inside diameter, 1/4 inch thick, weighing 21.8 grams. A pair of such magnets repel each other with about 25 pounds of force when touching, but only 5.4 pounds when 1/4 inch apart. The pencil sticking through the hole provides the needed stability.



Bogus Spatial Theories

We'll end our lesson in physics with two studies demonstrating how even our youthful imaginations tend to reflect physical understandings, which while misinformed, reveal our tendency to seek patterns reflecting mechanisms with which we are intuitively familiar.

Phenomenalism is the tendency to accept superficial appearances without inquiry as to what is transpiring underneath. From "Piaget and Subjects Peek Under Islands, The Student's Conception of the Physical World," Vassar Miscellany News, May 11, 1960,

What is under an island? Miss Katharine Taylor, retired director of the Shady Hill School, once thought to ask a third grade this question. She asked it by instructing the children to draw a picture of an island, not as it is shown on a map, but from the side, including whatever is under the water as well as what is above. Her subjects drew the island as a floating, unattached mass. Silly kids, you will say; anybody knows that islands are -- but wait. The same task was given to 70 Vassar students and to 65 male students from Yale, MIT, Princeton, and other citadels of higher learning. Twenty-eight of the Vassar students and nine of the men also drew floating islands.

One must not conclude, however, that everyone who did not draw a floating island therefore must have drawn a mountain thrusting up from the ocean floor.

Some people draw vegetation on the island and extend the roots down to the ocean floor, some merely draw a profusion of seaweed and count on this for anchorage, and others sketch in unidentified filaments joining island to bottom... Unanchored subjects, asked what keeps the island in one place, typically refer to its weight -- the problem of buoyancy just doesn't arise.

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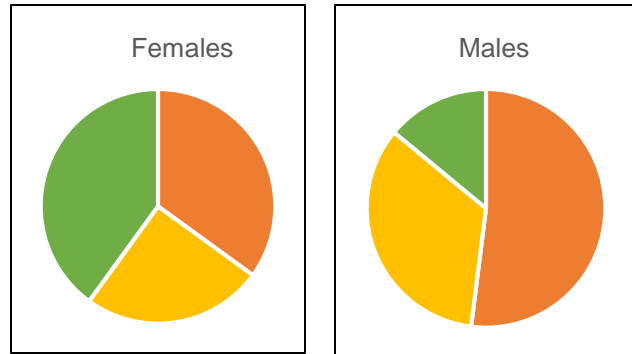
Some islands rest lump-like on the floor, others are partially embedded in it. Finally, some 52% of males and 36% of females depict truly mountainous islands.

Jean Piaget would class the floating island as an example of phenomenalism, a tendency to treat the surface appearances of things without inquiring into what goes on underneath.

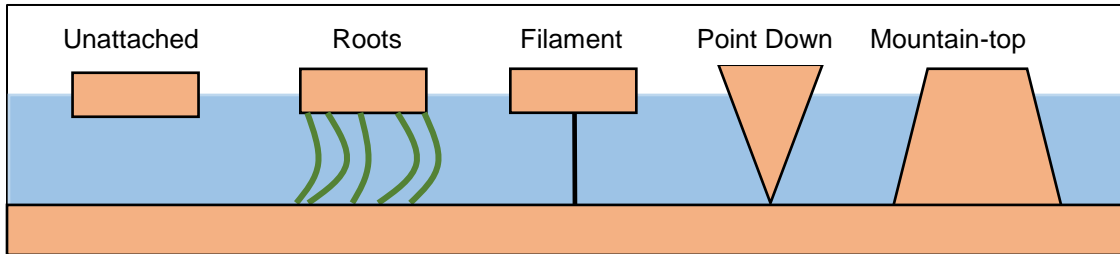
"Draw an island from the side, including whatever is under water," without suggestion that the island is floating or non-floating.

Responses are summarized to the right.

- Floating, unattached
- Floating, roots, filament or point down
- Mountain top



Schematics of Island-Placement Mechanisms



Although actual islands are, in effect, "mountain tops," roughly half of the surveyed males and roughly two-thirds of the females appear to think otherwise. Females are more likely to envision a freely-floating body; males, a buoyant object tethered by roots, a filament or a solid point. Such misperception may not be unanticipated for Miss Taylor's third graders, but is alarming for Ivy League undergraduates.

Susan Lowes' "Mapping the World: Freehand Mapping and Children's Understanding of Geography Concepts," Research on Geography Education, 10:2, 2008, documents how schoolchildren draw the arrangement of land masses upon the globe.



Three common arrangements.

Puzzle Map
Land masses fit together



Edge Map
Land masses clinging to circle's edge



Floating Island Map
Land masses scattered within circle

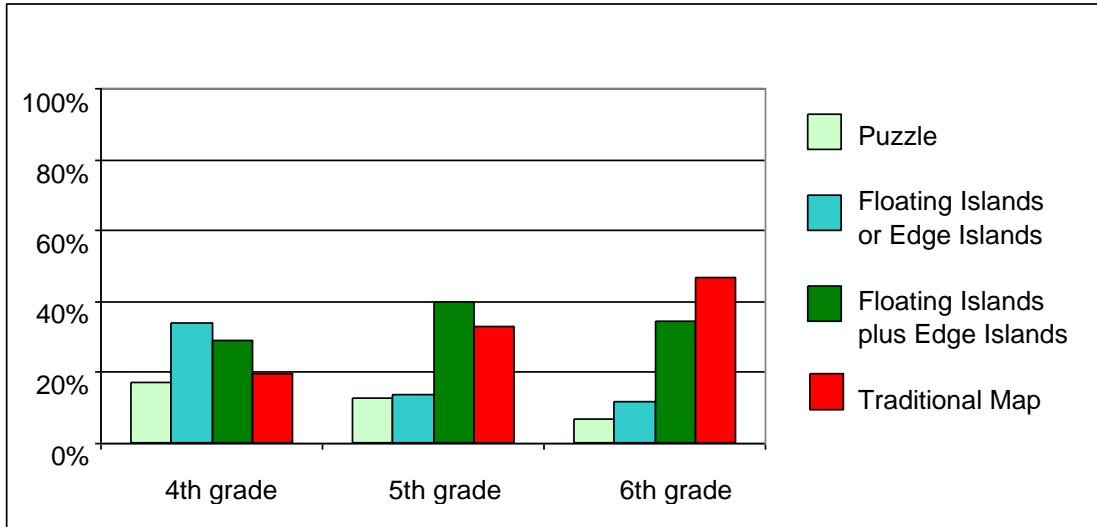
All three mappings illustrate a conceptual geometric regularity as a hint to an underlying physical causality, none of which is correct.

The puzzle layout seems to suggest an attractive pull, akin to a geographic gravity.

The edge arrangement hints of an earth-axis centripetal effect, an arrangement of land parcels around a central sea diametrically opposed the equally-imaginative surrounding-sea model of ancient civilizations (Chapter 1).

The floating Island arrangement brings to mind a dispersive force resembling that of gas molecules.

Classification of 229 maps collected in classrooms is shown below.



With age and education, perception tends to move away from the conceptual and towards the observed, not unlike the shift from a world of idealized Platonic forms to an earth of complex observed realities. What is disquieting, however, is that by 6th grade, roughly half the students are still befuddled.

CHAPTER 21 LOOK AGAIN

The metaphors of Chapter 15 include that of a floating island, but here we'll look at the floating island as an illusion of physical sight. That which the eye reveals may be other than truth.

An island can be physically altered to appear to float,
An island's representation can be altered to the same effect.
An island can seem to float in the mist.
Our eyes can affect the alteration for us.

Physical Deception

Limestone dissolution at a waterline can produce the illusion of floating.



Hundred Islands National Park and Surigao del Norte, the Philippines



Apple Canyon Lake, Illinois



Southwest Thailand

Perhaps the shadowing causes us to separate the feature from its foundation. Perhaps it is the fixity of the feature contrasted with the fluidity beneath. Perhaps our eyes wrap the convexity of the feature's lower corners into a lower boundary. Whatever trick our mind plays upon our eyesight, it's a trick for which we enjoy falling.

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Pomponius Mela, De Chorographia (c. 41) reports on an island situated in the Garonne, or perhaps the Loire River, in which flooding seems to alter the eye's judgement of landscape.

In this river there is an island, Antros by name, which the local inhabitants judge to be floating and to rise with the tide, because when the wave rises, it floods the lands before which the island is situated, even though they seem higher, while the river flows around the island as before; and because the areas which before were obscured by riverbanks and hills, stand clear as if seen from an elevated spot.

Inebriation

George Dennis The Cities and Cemeteries of Etruria (1883) Italian wine

Shall we not rather refer this unsteady, changeful character to the eyes of the beholders, and conclude that the propagators of the miracle had been making too deep potations in the rich wine of [the lake-side]? Now, at least, the islands have lost their erratic and Protean propensities, and, though still capped with wood, have taken determinate and beautiful forms, no longer plastic beneath the breath of Aeolus.

Representational Deception

When bent on trickery, a good ploy is to associate the deception with a deep-seated belief. Our example relates to a bit of illusion that would best be fostered upon a devout Moslem. From the Quran 17:1,

Glorious is He Who made his servant travel by night from Al-Masjid-ul-Haram to Al-Masjid-ul-Aqsa of which environs We have blessed, so that We let him see some of Our signs. Surely, He is the All-Hearing, the All-Seeing.

It is said (but not in the Quran) that when the Prophet ascended, a great stone also went up in the air until the Prophet ordered it to remain. Publicized on the internet without source attribution, the "Floating Rock of Jerusalem" is said to be the miraculous formation. To the right, photographic "proof."

An extension of this story say that the stone lies now under the Dome of the Rock, tightly guarded by Israeli soldiers.

Another version places the rock in Al Hassa, eastern Saudi Arabia, where it floats 10 centimeters from the ground at a specific time in the year and then sits back on the ground.



Some add that the rock tried to save a Jihadi, but when the Jihadi was martyred, his blood spilled on the rock where it can still be seen.

Clearly there are questions about the photo's authenticity.

Such a rock is not mentioned in historic Islamic sources.

The photograph's not in a building, albeit in Jerusalem or wherever.

If the rock is floating as shown, in open air near a village -- note the automobile, power lines and housing -- major media would surely have published confirming pictures.

The picture has been manipulated or doctored, "photo-shopped," in proprietary terminology. To the right, the source, a rock supported by at least three small nodules in Bayt al-Maqdis.



It is human nature to seek physical proof of belief founded in faith, but as we must ultimately concede, faith isn't faith if it's nothing more than physical observation. A faith in God is something different than a faith in gravity. Muhammad's message needs no graphically-altered gravity-defying stone.

Mistical (as opposed to Mystical) Apparition

The swirl of mist can make a stationary island seem to ethereally glide across the water surface. We've examples.



Wulingyuan, Zhangjiajie, Hunan, China

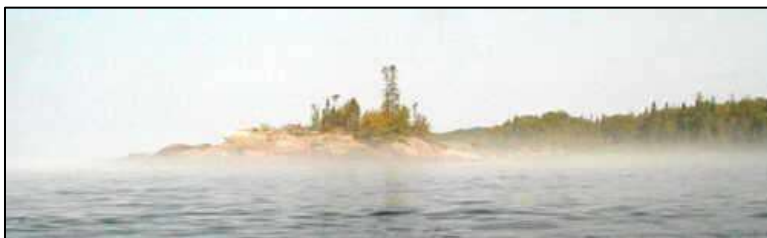


Guano-stained bird roost, "Misted," blog by Kay Cooke, 2013



Xin'an River, Huanshan, China

Michipicoten Island in northeastern Lake Superior is said by Ojibwa people to have once been a floating islands covered with flowers, trees, melodic birds, sparkling crystals and sweet fruits. Its ruler, a vexatious god Nanibojou, demand ornaments and tobacco thrown from off-shore and would throw up fog, causing any attempting to land to wreck on the shoreline.



According to Relation Particulière de ce qui s'est Passé dans le Voyage des Pères de la Compagnie de Jésus en la Nouvelle-France (1668) by Claude Dablon, the apparition was likely mist-induced.

It is a floating island, which is sometimes far off sometimes near, according to the winds that push it and drive it in all directions... The mists with which it is often laden, by becoming thin or dense under the Sun's rays, make the Island appear to the observer sometimes very near. and at other times farther away.

Alternatively, according to J. Disturnell in "Early French Discoveries in the Region of the Great Lakes," Sailing on the Great Lakes and Rivers of America (1874), geological change may have altered the distance to the mainland.

The savages say it is a floating island, which is sometimes far off and sometimes near, according as the winds move it, driving it sometimes one way and sometimes another. They add that, a long time ago, four Indians accidentally went there, being lost in a fog, with which this island is almost always surrounded.

There is both truth and error in this story, and this is most probably the explanation. When they said it was a floating island, it is probable they may have been misled by the vapors which surround it -- they being rarefied or condensed by the variable action of the sun's rays, made the island appear sometimes near and sometimes far off.

The southern entrance at Michipicoten Bay consists of a rocky promontory shaped like a Native American squatting with his feet in the water.

An unusual characteristic of Michipicoten is that it contains an island in a lake on an island in a lake on an island in a lake.



Visual Illusion

William Wordsworth's Guide through the District of the Lakes (1853) records an in Cumbria.

About eleven o'clock on the forenoon of a winter's day, coming suddenly, in company of a friend, into view of the Lake of Grasmere, we were alarmed by the sight of a newly-created Island; the transitory thought of the moment was, that it had been produced by an earthquake or some other convulsion of nature.

Marvelous was the illusion! "How little faith," we exclaimed, "is due to one sense, unless its evidence be confirmed by some of its fellows! What stranger could possibly be persuaded that this, which we know to be an unsubstantial mockery, is really so; and that there exists only a

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single Island on this beautiful lake?" At length the appearance underwent a gradual transmutation; it lost its prominence and passed into a glimmering and dim in version, and then totally disappeared -- leaving behind it a clear open area of ice of the same dimensions. We now perceived that this bed of ice, which was thinly suffused with water, had produced the illusion, by reflecting and refracting (as persons skilled in optics would no doubt easily explain) a rocky and woody section of the opposite mountain named Silver-how.

A patch of ice had produced the illusion by reflecting and refracting a section of the opposite mountain.

In Lake of Tears (2012), Paul Tomlin speaks of the unsettling question of an observer. Is he drifting toward an island, or is the island drifting toward him?

There was some soft thunder off in the distance. The sky kept getting darker and darker as if it was night. I did not notice at first that we had drifted toward an island. I did not even remember seeing it before. I could swear that it was alive because it came from nowhere. It was seemingly creeping ever so closely as being summoned by the serpent that lay beneath the murky surface. Now the water seemed to be getting a little rough. From nowhere, a cold wind came silently, chilling the body as it drifted by. Not to be seen, only felt as if to jar one's nerves.

There were small whitecaps forming, also checking my nerves that they were certainly starting to shake. The next thing I knew, I was getting even closer to that drifting island, or was I the one who was drifting? Did the island have legs and was walking toward me? The long roots looked like they were protruding out from the tall grass, and the cat of nine tails were tiptoeing throughout the mud on the bottom and darting out from under it.

In "The Island of Gotland and the Ancient City of Wisby," Sweden and the Swedes (1893), William Thomas suggests a visual misimpression due to the curvature of the earth,

Far out on the wild Baltic Sea, there floated, of yore, a wondrous island. Now and again, some adventurous or storm-driven mariner caught sight of the low and indistinct outlines of this fabled isle, shimmering in the moonlight. But, if the sailor laid to his craft and waited for day, lo! the island vanished with the dawn, and only a wide expanse of white-capped waves rolled where dark groves had stood all through the hours of night. For this strange island sunk beneath the sea every morning, and where it would reappear, when the night came again, no man knew, for it drifted about through the seas like a spectreship.

But, at last, a stalwart northern chieftain, Thjelvar by name, sailed forth from the coast of Sweden in quest of this ghostly holm. Fortune favored the valiant sailor. He succeeded in effecting a landing on the shores of this drifting, sinking no-man's-land. Instantly, he struck fire. The heaven-born flames, as they leaped on high, drove out the demons and trolls and powers of darkness that had bewitched this wandering isle, and it now became fixed and stable. So was Gotland located and settled.

Now this is only a myth, to be sure; but it may embody history for all that. The island, drifting about -- now here, now there -- may mean only that it was difficult for seafarers to hit upon an isle lying so far away from shore, as, indeed, it must have been, before the discovery of the mariner's compass. That it now floated on the waves, and again was lost beneath them, might well signify that, as you sailed away from such a low-lying island, it soon sunk beneath the sea.

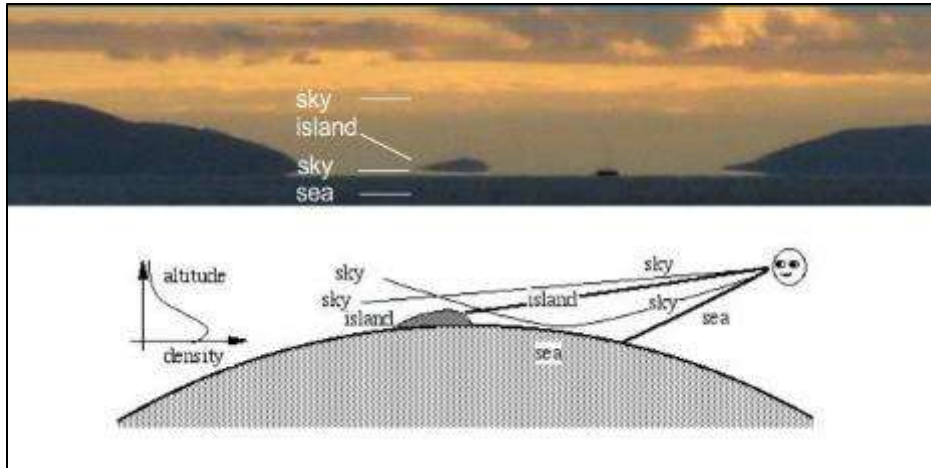
It is hard to fathom, however, how a landform falling beyond the horizon would be so misconstrued by a sailor.

The visual illusions most likely to occur are due to the bending of light.

A mirage is a product of atmospheric refraction. When the sea is warmer than the atmosphere in late summer, the lowest layer of air is heated which decreases its density to a value less than that of the air above. As denser air slows light slightly more than does air less dense, the denser air's higher refractive index causes light to bend as it passes from the warm air into the cool. Light travelling roughly parallel to the sea is thus curved slightly upward. Watching a seascape from an

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eye level between 2 and 3 meters above the water surface, a thin slice of sky above the horizon and the inferior mirage below become welded together and the observer sees sky where the water should be, an "inferior mirage."



The higher the view, the less visible the mirage. The lower the view, the thicker the slice that the mirage "cuts" off the horizon.

"The Gulf Idyll," *Antipodian*, Christmas 1887, by George Evans, describes such a sighting.

There was not a cloud in the sky; scarcely a blade of grass on the baked earth; everywhere the sun poured down a Hood of blinding light; and heat. Away to the west the vague summit of a mountain rose faintly above the horizon -- a dim, blue isle afloat in a sea of mist.

To north a few scattered groups of cattle, nibbling at the grass roofs, were distorted by the quivering haze into beings of fantastic shape and size

Three photos of Isokari Lighthouse, Finland



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George Hutchinson, in [A Treatise on Limnology](#) (1957-93), mentions a 100-meter floating island in Kingston Harbor, Lake Ontario, around 1951. Such sightings had occurred before, though as we will see, may have been illusions. In July 1866 mirages of boats and islands were seen from Kingston. From the [Kingston Daily News](#), July 9, 1866,

The atmospheric phenomenon known as "mirage" might have been observed on Sunday evening between 6 and 7 o'clock, by looking towards the lake. The line beyond which this phenomenon was observable seemed to strike from about the middle portion of Amherst Island across to the southeast, for while the lower half of the island presented its usual appearance, the upper half was unnaturally distorted and thrown upward in columnar shape with an apparent height of two to three hundred feet. The upper line or cloud from this elevation stretched southward, upon which was thrown the image of objects. A barque sailing in front of this cloud presented a double appearance. While she appeared slightly distorted on the surface of the water, her image was inverted upon the background of the cloud referred to, and both blending together produced a curious sight. At the same time the ship and its shadow were again repeated in a more shadowy form, but distinct, in the foreground, the base being a line of smooth water. Another bark whose hull was entirely below the horizon, the topsails alone being visible, had its hull shadowed on this foreground, but no inversion in this case could be observed. It may be added that these optical phenomena in regard to the vessels could only be seen with the aid of a telescope, for the nearest vessel was at the time fully sixteen miles distant. The phenomena lasted over an hour, the illusion changing every moment in its character.

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Floating Island is an isolated mountain surrounded by mud flats in the heart of Utah's Bonneville Salt Flats.



The mountain can "float" for either of two conditions:



When rainfall accumulated on the surrounding plains causes reflection.



When mirage causes the mountain to seemingly hover above the horizon.

Fiction

A writer of fiction has license to float landforms in the eyes of characters.

From John Powys' Weymouth Sands (1934),

But Portland, as it lay before them, rising tier by tier over its terraces of old walls and grey roofs, seemed to be tugging at its tether in that luminous and liquid haze, seemed to be straining at this gigantic rope of transparent stones, agates and carnelians, which bound it to the mainland. The huge limestone rock seemed to have no roots, under this enchanted light, in any solid earth. It seemed to be riding, just as the battleships in the harbour seemed to be riding, upon a liquid abyss of opalescent water that sank down to the antipodes. And the Jobber got the impression that this stupendous mass of oolite was really afloat today in this translucent calm; not only afloat, but longing to drift off, to sail out and away, over the surface of that halcyon sea.

Joe Christopher, in "A Second View of "Castleview," review of Gene Wolfe's Castleview (1990), Quondam et Futurus 3:3, Fall 1993, suggests a floating island as explanation for befuddling sightings.

The fact that this island lies in an ocean in its supernatural world explains the scene in which a human, Judy, on the island sees waves between her and her home. There are probably other possible explanations for the way in which the castle on the island is sometimes seen from the

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town from one angle, sometimes another, but the most likely is that the island is a floating island, restricted to a general area but moving freely within it.

Castleview being science fiction, things can be a bit strange

System of Reference

An island can be perceived to move, not as a visual misinterpretation, but for reasons of practical advantage. Our example is that of a traditional way of Micronesian navigation in the open-sea setting described by T. Gladwin in East Is a Big Bird (1970)

Picture yourself on a Puluwut canoe at night. The weather is clear, the stars are out, but no land is in sight. The canoe is a familiar little world. Men sit about, talk, perhaps move around a little within their microcosm on either side of the canoe, water streams past, a line of turbulence and bubbles merging into a wake and disappearing into the darkness. Overhead there are stars, immovable, immutable. They swing in their paths across and out of the sky but invariably come up again in the same places. You may travel for days on the canoe, but the stars will not go away or change their positions aside from their nightly trajectories from horizon to horizon. Hours go by, miles of water have flowed past, yet the canoe is still underneath and the stars are still above, back along the wake however, the island you left falls further and further behind, while the one toward which you are heading is hopefully drawing closer. You can see neither of them, but you know this is happening. You know, too, that there are islands on either side of you, some near, some far, some ahead, some behind. The ones that are ahead will, in due course, fall behind. Everything passes by the little canoe -- everything except the stars by night and the sun in the day

In "Why the Islands Move," Perception 13, 1984, Edwin Hutchins and Geoffrey Hinton describe the moving system of reference by which the paddlers envision their unseen destination to be traveling to a celestially-indicated point on the horizon, while they, the voyagers, are situated in a fixed place under that same starry sky.

Micronesian navigators judge distance in a way that seems odd. When they are out of sight of land, they imagine that the canoe is stationary and that the islands move back past them. For each voyage, they "attend" to an island off to the side of the course which is out of sight over the horizon. As they sail, they imagine the island moving back along the horizon changing in hearing until it is imagined to be under the bearing it is known to have from the destination island. Then they know they are near their destination.

A linear constellation is a group of stars which when observed from any fixed latitude all rise at nearly the same bearing (azimuth) in the east, and all set at about the same bearing as each other in the west.. While the stars themselves make their nightly journeys across the sky, the arcs of the linear constellations remain stationary. Seeing the night sky in terms of linear constellations is a simple representational device that converts the moving field of stars into a fixed frame of reference. Caroline Island navigators have assembled thirteen of these linear constellations, plus the North Star and live positions of the Southern Cross, into a sidereal compass which has thirty-two compass points defined by star bearings.

Courses between islands are defined in terms of this abstract sidereal compass. For every island in a navigator's sailing range, he knows the star point under which he must sail to reach any other island in the vicinity.

The notion of the changing bearing of the reference island can be accommodated by our usual way of thinking in which the canoe is in motion while the islands are still. Why then would Micronesian navigators insist on what they know to be a fiction and imagine that the canoe is stationary with the islands in motion about it?

The last sentence encapsulates the genius, negotiating "what they know to be a fiction" to achieve very-real nautical accomplishment.

This solution is in complete accord with the perceptual evidence and, furthermore, updating the representation requires moving only one of the three frames. The islands move in the Micronesian method because having them do so accords with the direct perceptual evidence, minimizes the number of moving systems, and organizes the navigator's perception of the world in a way that permits him to answer directly the question "When will the reference island have the same star bearing from my canoe that it has from the goal island?"

This technique minimizes the number of moving systems by allowing the two systems that are directly visible during the main part of the voyage (canoe and stars) to have zero linear velocity while requiring the system that is unseen and only imagined for most of the voyage (the islands) to move.

The traditional paddlers follow the same oceanic route that a modern ship's captain would steer, but do so without need for cognitive mathematics.

Conclusion

Visual deception is common in the mythology and literature of floating islands, and in fact, can be employed for seagoing advantage. We've tales in Chapters 3-5 of mist-shrouded islands visible to but a selected few. Modern literature, prone to the explicit introspective, not uncommonly broadens an account of an island's sighting into the confusion regarding what is being seen.

While mirages can lead to a variety of illusionary sightings, we suggest that no category is more cited than that of an island hovering just above the horizon.

The concept of floating islands can guide our eyes as much as our eyes inform our concept.



Insel Trimelone, Lago di Garda, Italy



Fentol Lake, Ontario

CHAPTER 22

CHECK FOR ORGANIC CERTIFICATION

Also called "tussocks," "floatons," "floating bogs" or "sudds," floating islands are buoyant mats of aquatic plants, peaty soil, sphagnum moss and organic detritus ranging in thickness from a few centimeters to several meters and can be as large as several hectares.

As the genesis of many floating islands is in wetland biology, let us note some of the terminology.

Camalote or Camalotale	Newly-formed floating islands in South American lakes and rivers where Eichhornia typically composes the floating substrate, having not yet been replaced by organic soil.
Baceiro or Batumen	Paraguayan term for camalote
Embalsado	Floating islands in the later stages of succession in South American lakes and rivers in which organic soil serves as the substrate binder, often dominated by <i>Cyperus giganteus</i> .
Floating Bog	North American term equivalent to schwingmoor
Floating Mat	General term for a floating vegetation structure
Floating Meadow	General term for a floating vegetation structure, most often one with minimal soil content
Flotant	Louisiana term for floating vegetation in the Mississippi River Deltaic Plain. Early French settlers dubbed the city of New Orleans, itself, "Le Flotant."
Shore Fen	Littoral wetland on the Great Lakes region, but also used to specifically refer to a floating sedge mat at a lake inlet
House	Consolidated peat island developing from a battery, specific to the Okefenokee Swamp in Georgia
Kragge	Floating fen rafts on Dutch turbaries
Phumdi	Floating masses of soil and vegetation, Loktak Lake, India
Quaking Bog/Fen/Mire	General term for mire with an undulating surface when walked upon; includes floating formations but also terrestrial peatlands where the underlying substrate has a high water content
Schwingmoor	Used loosely in the context as a quaking mire, but normally applied more strictly to peat-forming mires floating over free water within a basin
Scragh	Irish term equivalent to quaking mire
Sudd	Floating tropical swamp, usually dominated by <i>Cyperus papyrus</i> or <i>Miscanthidium</i> . Mainly used in an African context
Turf Pond	Peat cutting re-colonized by fen vegetation, often as a floating or semi-floating mat; specific to the East Anglian Broads

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Tussock	Floating vegetation raft, generally with little or no organic matter, and more often dominated by smaller plants
Mud Tussock	Floating vegetation raft in which large amounts of organic matter are entrapped within the root mat. Specific to Florida.

Pioneered by free floating plants whose stoloniferous habit creates a compact floating mat of plants and organic debris, the formation spreads from sheltered marginal sites onto calm open shallows. Rhizomes and roots do not anchor, but form a stable raft a few centimeters thick. The formation is gradually overgrown by floating or submerged aquatics.

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Most floating islands are composed of aquatic flora and/or floated peat. We'll sort our examples accordingly, realizing, however, that few cases are truly monolithic. Organic mats rich in water lilies, such as the Okefenokee Swamp or the Everglades, for example, usually have both peat and roots within the mat matrix. These floating mats are then colonized by shrubs, bushes or even trees, material which, both standing and fallen, enhances the island's structural integrity. Composed vegetation from the surface of a buoyant mat contributes to the growth of fresh peat.



In Florida, vegetation ranges from soft tissue herbaceous plants to trees 10 inches in diameter and 50 feet tall. Drifting masses of peat, mud and plants can range in size from a few feet across to hundreds of acres with trees more than 50 feet tall and 8 to 12 inches in diameter.

According to Dan Thayer, head of land and vegetation management for the South Florida Water Management District,

It looks like there's all this potting soil floating on the surface. You have all the ingredients for plants to grow rather rapidly.



A 35 acre i islands drifting in Lake Pierce.

Aquatic Flora

Most floating islands are comprised, of vegetation that grows upon the waterbody or on the banks thereof.

Nymphaeaceae, the water lily family, consists of about 70 flowering species. Lilies root in the bed of bodies of water, with leaves and flowers floating on the surface.



Such plants can dominate large areas, "Soldiers Work to Clear Water Lilies Causing Philippines Flooding," Voice of America, June 20, 2011, serving as an example.

Soldiers in the Philippines are using chain saws and machetes to clear thick mats of water lilies that are clogging the nation's second longest river, causing floods that submerged more than 30 villages.

Officials said Monday they had cleared about eight hectares out of about 20 hectares of lilies that have caused severe backups in the 320-kilometer-long Rio Grande River on southern Mindanao Island. They said the action has reduced the number of flooded villages from more than 30 to about 15.

A regional military spokesman told the French news agency the growth was about 3 meters thick and so tightly packed in places that the soldiers could walk on top of it.

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Mrs. W.F. Fuller brought *Eichhornia crassipes*, the water hyacinth, from the 1884 New Orleans Cotton Exposition to her Florida home, where they quickly overran her garden pond. She tossed excess plants into the St. Johns River and within a decade the hyacinth became a "lovely plague" of purple-blossomed floating mats impeding navigation. The hyacinth may rise above the water surface by as much as 1 meter.



Blaming Mrs. Fuller may be not totally fair, however, as we've steamboating reports that predate her aquatic contribution.

"Six Weeks in Florida," Harper's, October 1870,

Now and then the steamboat would shoot out into a more open space, and where there did not appear to be any outlet, where the bow of the boat seemed about to be crushed against the land; but it parted before us, and what appeared to have been the solid earth was but a floating island, which went dancing and torn in the wake behind us, its long roots thrown up to the troubled surface of the water.

"Florida Correspondence," Bloomfield Citizen, January 24, 1874,

Now and then the Rover would shoot into a more open space, and where there did not appear to be any outlet where the bow of the boat seemed about to be crushed against the land, but it parted before us, and what appeared to have been the solid earth was but a floating island which went dancing and torn in the wake behind us, its long roots thrown up to the surface of the water, at every turn in the river, and it had an endless twist and turn, the tall forms of the blue and white herons would rise from the shallow water and fly before us.

It is a fact however, that the infestation quickly exacerbated.



Three small steamers attempt to make their way through St Johns River.

"Collision with a Gator, Running into a Florida Monster with Serious Damage to the Vessel," New York Evening Telegram, March 26, 1889,

The steamer Comet came down from Crescent City the other morning with her bow stem broken and several planks sprung, says the Patatka (Fla.) Herald.

It seems that while coming around a sharp bend in Dunn's Creek, known as Danger point, she struck a huge alligator, which is claimed by the captain to have been about eighteen feet long. This creek connects Lake Crescent with the St. Johns River, and is famous for its floating

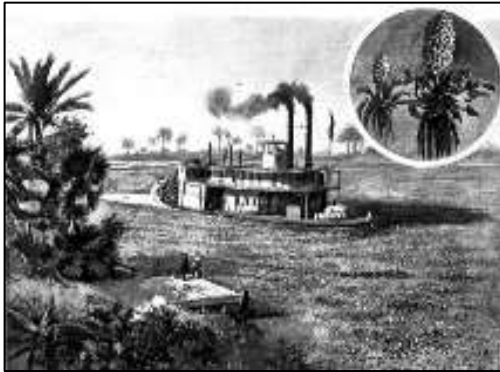
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islands, which are composed of bonnets, water lilies and other vegetation as grow in Florida. The Comet is in the habit of running into these floating islands without checking her speed.



Boat stuck in the Oklawaha, 1892



Lake Monroe, in the early 20th century

The state now spends more than \$11 million annually to control the problem. See Chapter 82.



John E. Mathews Bridge, Jacksonville, 1963 and today

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Salvinia molesta, kariba weed, sometimes coalesces into floating substrate for successional development of floating wetlands but the species more typically occurs in large aggregations of free-floating individual plants.



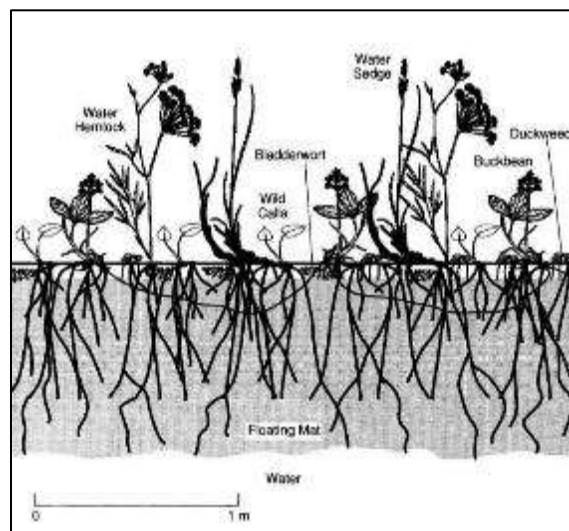
Myriophyllum spicatum myriophyllum, milfoil, grows in water that is 3-12 feet deep



Hydrilla verticillata, esthwaite waterweed, can grow and mat in 20 feet of water and is capable of forming a surface mat 2 to 3 feet thick. The stems below are virtually without leaves due to lack of sunlight.



A sketch from Tanana Flats, Alaska



Frequency of occurrence of major types of floating islands on Orange Lake, Florida, October 1997.

BCS: Bur marigold, cattail, and smartweed; one of these taxa dominant with 50% coverage.

CBWP: Cuban bulrush and water pennywort; Cuban bulrush dominant with 50% coverage, or water pennywort the only plant with 50% coverage.

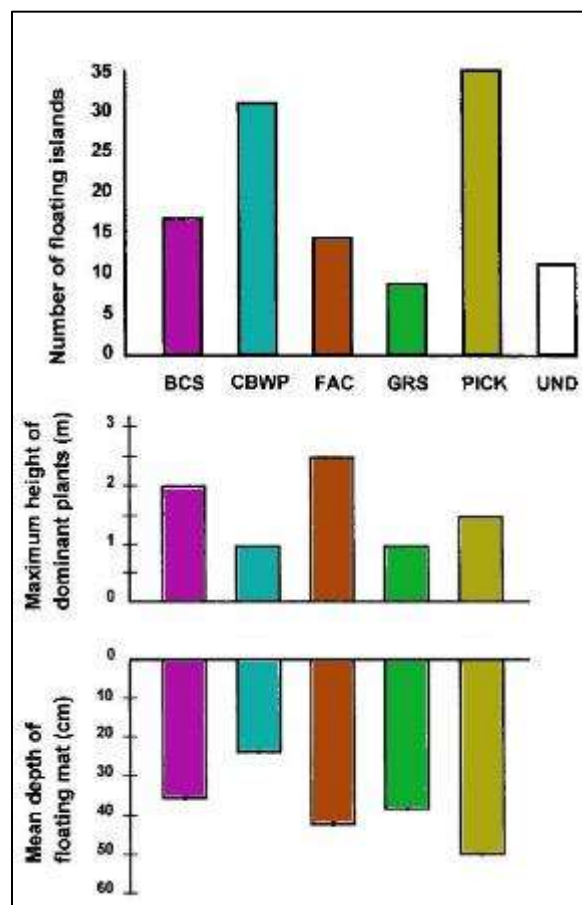
FAC: Facultative; 50% combined coverage of facultative and facultative-wetland taxa, and one of these taxa dominant or co-dominant with 40% coverage.

GRS: Grasses; American cupscale grass or maidencane dominant with 50% coverage.

PICK: Pickerelweed; pickerelweed dominant with 50% coverage.

UND: Undefined combination of above; types or dominated by arrowhead, frog's-bit, swamp loosestrife or wild taro with 50% coverage.

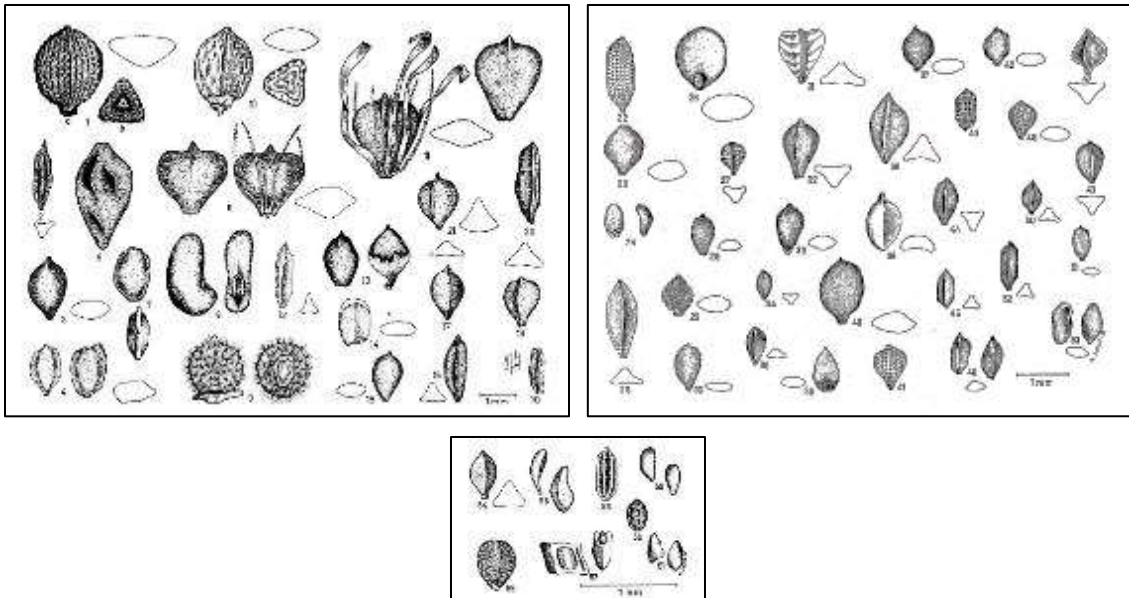
Source: "Physical and Vegetative Characteristics of Floating Islands," *Aquatic Plant Management* 39 (2001), by Craig Mallison, Randall Stocker and Charles Cichra





Orange Lake

What may appear to some of us to be just another floating salad bowl can be a treasure chest to those who look more closely. Ichiroku Hayashi, Juan Pancho and Soetikno Sastroutomo, in "Preliminary Report on the Buried Seeds of Floating Islands and Bottom of Lake Rawa Pening, Central Java," *Japanese Journal of Ecology* 28.4 (1978), illustrate the catalog of seeds discovered in one survey.



Growths of cattails, bulrush, sedge and reeds often extend outward from a wetland shoreline, the decomposing vegetation releasing gases that create buoyancy, the surrounding vegetation supporting upright orientation. Buoyant vegetation extends onto open water, the roots and rhizomes bind together to form an organic mat, which in turn can capture water- or wind-borne sediment as soil for further flora. Such floating wetlands can cover hectares. Rates of expansion are illustrated below.

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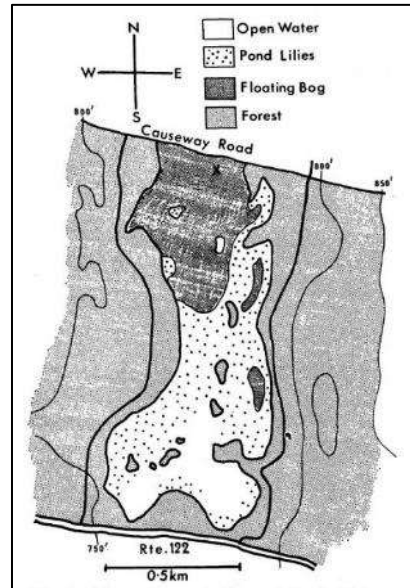
Site	Habitat	Rate of spread
Harvard Pond, Massachusetts	Chamaedaphne/Sphagnum raft on shallow dam pond	7 cm/year
Thoreau's Bog, New Hampshire	Ombrotrophic, acidic Sphagnum-dominated	5 cm/year
Okovango Delta, Botswana	Tropical <i>Pycreus nitidus</i> sudd	146 cm/year

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Some additional detail on the Harvard Pond example:

A wetland forest was cut about 1830 and *Charmaedaphne calyculata* invaded the tree stumps between 1830 and 1890 when they were located in a sedge meadow.

The pond was formed about 1890 and the floating mat developed as the *Chamaedaphne* spread across the water surface between stumps. In 30 years, the bog advanced approximately 2 meters.



1938 and 1968

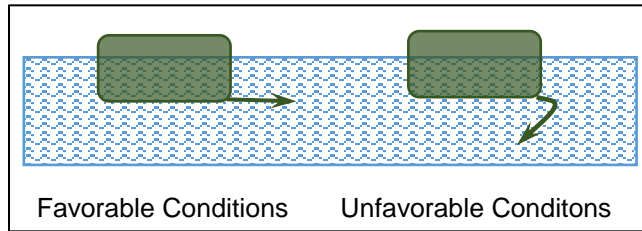


In "The Vegetation of Connecticut IV. Plant Societies in Lowlands," Bulletin of the Torrey Botanical Club 42.4 (1915), George Nichols, notes the progression of sedge roots.

*In Michigan... the most important mat-forming plants are the sedges, particularly *Carex filiformis*. This species is capable of spreading rapidly by means of rhizomes. As pointed out by Davis, these subterranean or subaquatic stems will often grow horizontally a foot or more in length during a single season, producing at the nodes an abundance of tough, slender roots,*

and bearing at their tips terminal buds from which new plants rise to send out in turn a new series of horizontal stems.

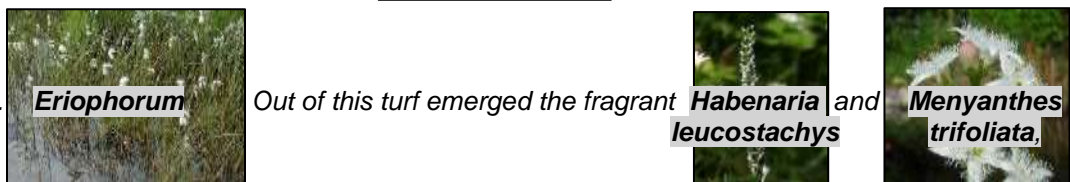
When conditions are unfavorable for the rhizomes to grow outward into open water, they sometimes grow diagonally downward over the edge of the mat, and thus the mat is strengthened as well as extended by the growth of the plant.



Following are several examples of the propagation of aquatic flora.

For those who appreciate picture books, we'll botanically illustrate a portion of H.H. Behr's "Botanical Reminiscences of San Francisco," *Erythea* 4 (1896) regarding biotic succession in the marshy area that once existed between Mission Creek and the Second Street Cut.

Where the water collected into small rivulets, it became hidden under the dense, mossy, and



These were the most conspicuous and at the same time the most frequent plants of the formation.

Where the rivulets approached and extended to the serpentine courses of the tidewater creek, the formation changed; the Azolla carpet dissolved into floating islands before disappearing entirely, the grasses and Cyperaceae lost their dens turfy appearance and developed higher stems with more conspicuous in florescence and fewer leaves.

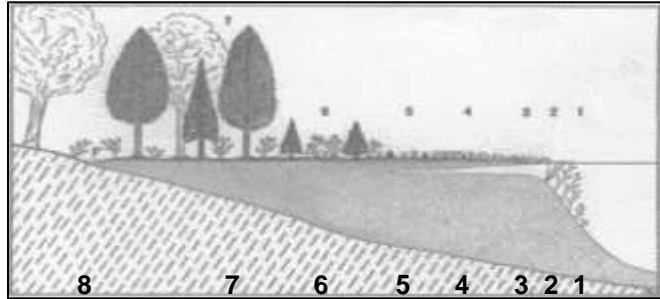
From the *Manual of the Geology of Connecticut* (1906) by W.N. Rice and H.E. Gregory,,

Certain mosses, particularly those of the genus *Sphagnum*, have a habit of growing out on the water surface and forming a mat of intertwined stems connected with the shore. At this stage

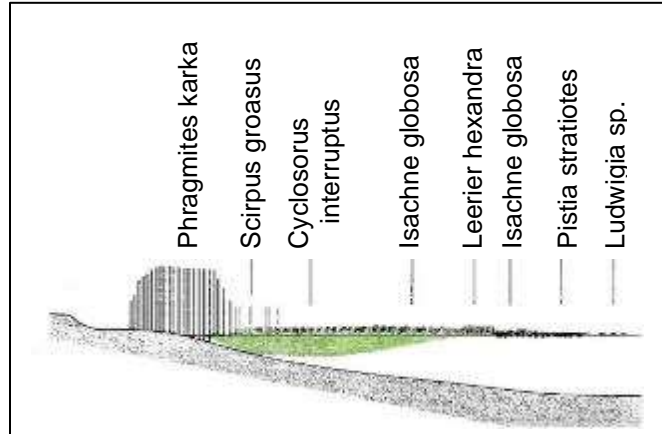
the lake is an open water body with a border of vegetation floating near the rim. Gradually this rim of moss creeps toward the center of the pond until it is completely closed in and covered over with a layer of vegetation. The lake is now a swamp; and such a swamp, with a floating layer of aquatic plants, is known as a "quaking bog." It is possible in some cases to walk across an old lake on a mat of vegetation while the water remains below. These mosses have a habit of growing at the top while the old stems are dying below, and the rotted fragments drop to the bottom of the pond and help to fill it up.

Bog formation in Connecticut.

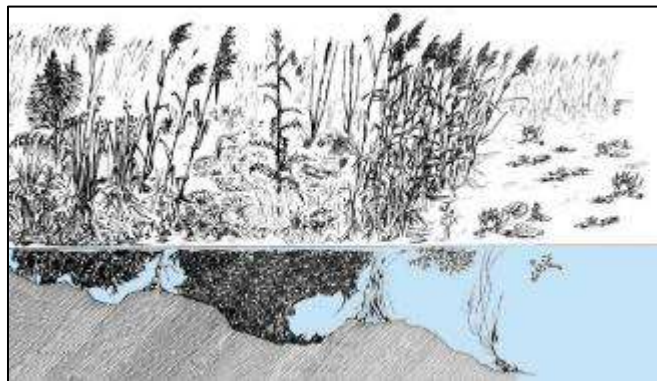
1. Pondweed
2. Water-lily
3. Decodon
4. Cassandra-Sphagnum
5. Cassandra-Sphagnum-Sedge-Low Spruce
6. Tall Shrubs
7. Bog Forest.
- 8 Marginal Ditch or "Fosse"



A third Connecticut example.



Lago di Sibolla, Italy



Oxbow billabongs in the Australian Northern Territories

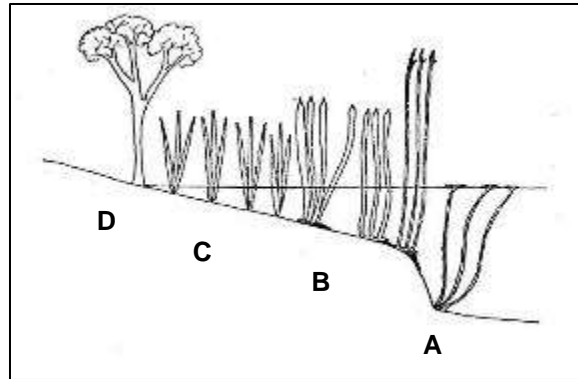
1. Banks lined by the intrusive Phragmites karka up to 4 meters tall, interlaced with vines.
2. Scirpus grossus zone, mostly floating, complemented with vines, young Phragmites karka, a reedy grass growing to 4 meters high and occasional Cyclosorus interruptus.

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3. Belts of the bullrush, *Typha* sp., extend into floating vegetation further out, dominated first by sedge, then fern, and then the grasses *Isachne globosa* and *Leersia kemandra*
4. Cyclosorus zone characterized by the fern *Cyclosorus interruptus* growing among *Isachne globosa* and *L. hexandra* grasses. Also are a number of vines, sedges 1 to 2 meters tall, and *Coleus scutellarioides*, a small, erect herb rooted in the mat. Here the mat thickness can exceed 1 meter and easily support the weight of a person.
5. Where the mat meets open water is a space community of such free-floating vascular saprophytes as *Pistia stratiotes* and *Ludwigia* sp.

Thirlmere Lakes, New South Wales.

Zone	Species	Depth (m)
D	<i>Melaleuca linariifolia</i>	0-0.3
	<i>Lepyrodia muelleri</i>	0-0.1
C	<i>Lepidosperma longitundinale</i>	0-2
B	<i>Lepironia articulata</i>	2-4
	<i>Eleocharis sphacelata</i>	1-2
A	<i>Brsenia scheberi</i>	4



Free-floating plants in tropical floating wetlands can become sufficiently aggregated to provide a platform for colonization by sedges or semi-aquatic grasses.

In the Okovango Delta, sudd-forming sedge colonizes on submerged detritus or masses of the aquatic spike-rush.

The above mats are not "islands" in a landform sense until they detach from the shore, and this can happen in several manners, two common mechanisms being flood and ice.

Oft-reported stories of flood-freed islands of uprooted vegetation are those of the South American "camalotes," Chapters 28 and 42.

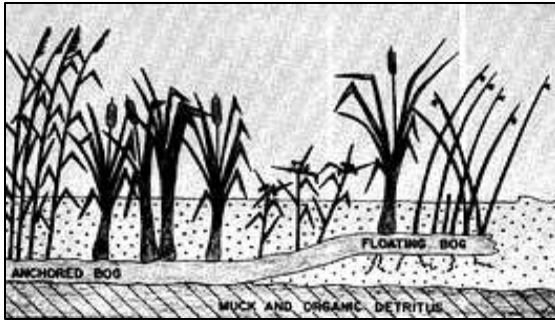
In 1993 on Florida's Lake Istokpoga and in 1994 on Lake Okeechobee, rapid increase in water level tore loose hydrilla, hyacinth and other aquatic plants, and wave action shredded the product, to form a floating mat several feet thick and compacted enough to walk on.

With decomposition at the surface, the mat supports new aquatic and wetland plants whose roots further bind the matter. In the case of Lake Okeechobee, the product was a floating island 15 miles long and several hundred feet wide.

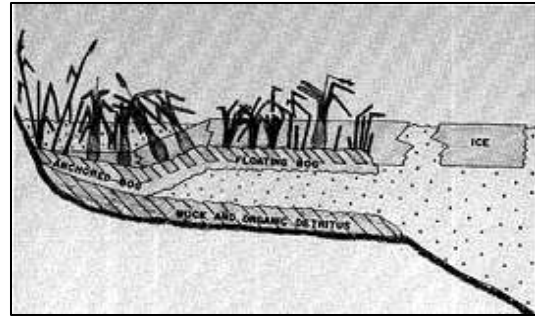


In temperate northern latitudes where the winter temperature varies, when lake ice contracts, it either pulls away from the shore or cracks and the exposed water immediately freezes. When the temperature rises, the ice expands and the solid cover pushes onto the shore. "Floating Island-Forming Mechanisms from Rich Kahl," *Aquatic Macrophyte Ecology in the Upper Winnebago Pool Lakes, Wisconsin*, Technical Bulletin No. 182, Wisconsin Department of Natural Resources, (1993) illustrates the sequence.

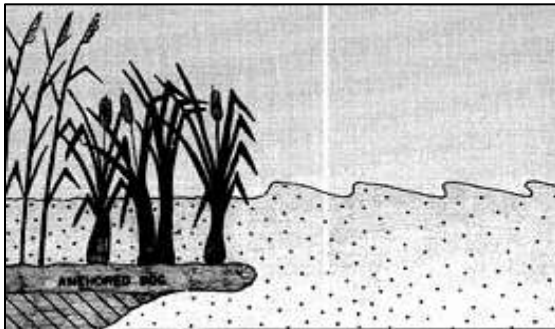
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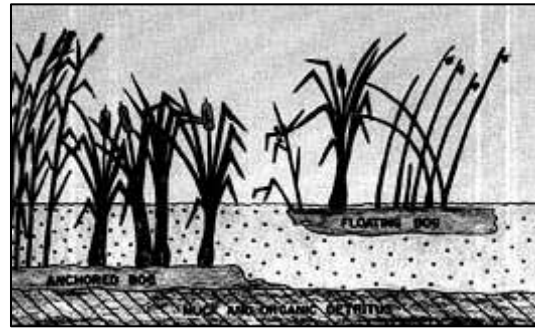
(A) Fluctuating water lifts rhizomatous away from underlying substrates.



(B) Water lifts ice within rhizomatous mat, tearing it free from substrates.



(C) Substrates under rhizomatous mats scoured away



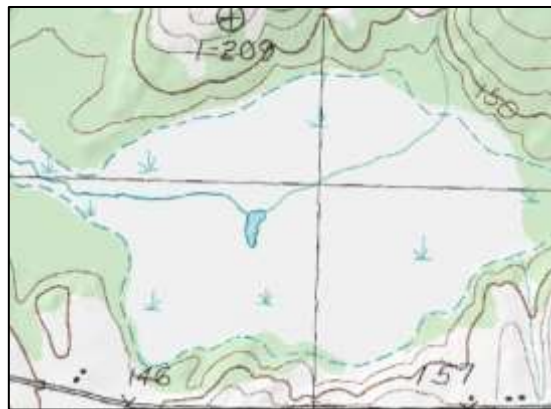
(D) Wave and ice action break mats into mobile islands.

In some lakes and ponds, mat encroachment from the margins may eventually overwhelm the water surface.

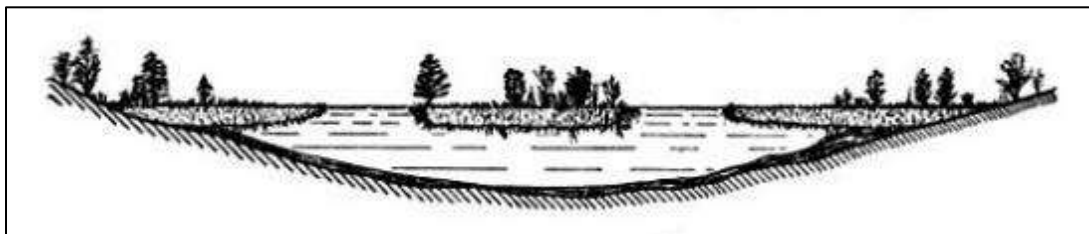
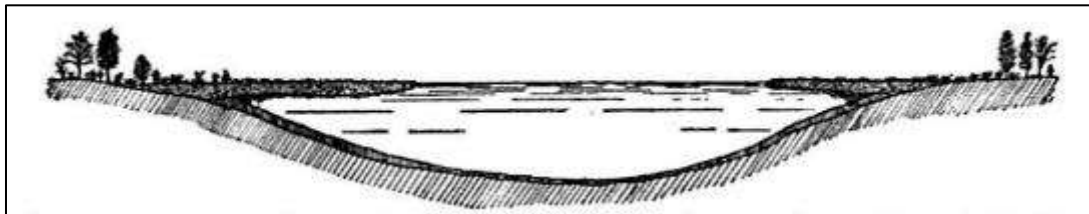
Early stage. The pond portion of Vermont's Molly Bog, approximately 2.2 acres and more than 12 meters deep, is surrounded by a floating peat mat approximately 15 meters wide and up to 1.5 meters thick.



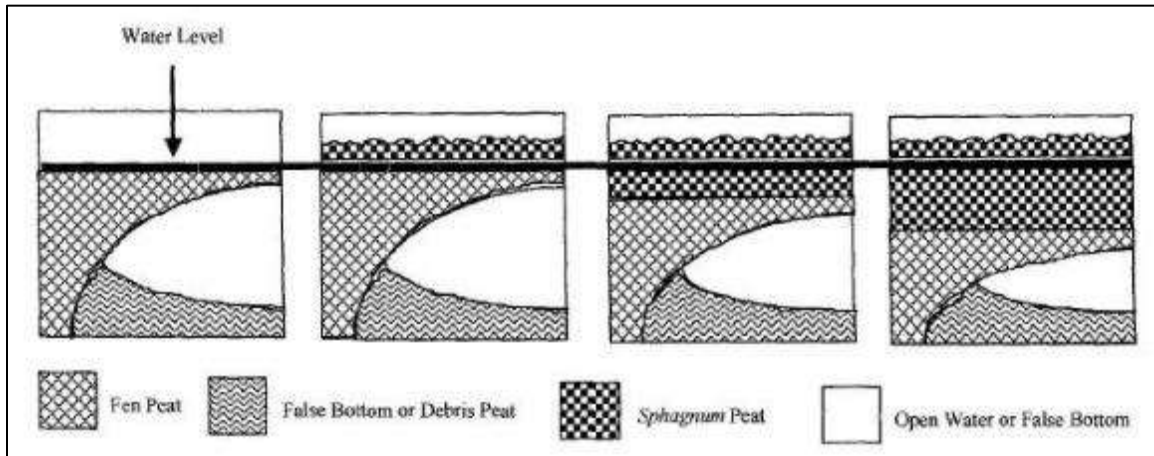
Later stage. Further north lies Franklin Bog, nearly overwhelmed by a mat of sphagnum moss and leatherleaf.



Below are illustrations of bank accretion and subsequent island formation from "Floating Islands," *Popular Science*, September 1911 by Sidney Powers.



A representation of how the process may conclude,



A fen is one of two types of mire (the other being a bog). It is usually fed by mineral-rich surface water or groundwater. Fens are characterized by a pH which is neutral or alkaline, with relatively high dissolved mineral levels but few other plant nutrients. Fens are usually dominated by grasses and sedges, and typically have brown mosses.

Coarse sediments carried into a waterbody by tributaries tend to quickly settle, leaving particles remaining in suspension for a period more likely to be incorporated into a floating island.

"Some Ecological Observations on Floating Islands," *Hydrobiologia*, 60:2 (1978), by R.K. Trivedy, K.P. Sharma, P.K. Goel and B. Gopal, describes a 2 by 0.4-kilometer eutrophic impoundment, 6 to 8 meters deep, near Jaipur, India, that contains floating islands of *Typha* or *Phragmites*, 1 to 15 square meters in area and 50 centimeters thick.



Note the difference between lake bed and floating islands.

	Soil	Clay	Silt	Fine Sand	Coarse Sand	Organics
Lake Bed		5.9	4.5	13.9	56.0	19.7
Floating Islands		2.8	13.2	25.2	5.1	46.9

George Nichols, "The Vegetation of **Connecticut** IV. Plant Societies in Lowlands," Bulletin of the Torrey Botanical Club 42.4 (1915),

*Along the western shore of one of the Twin Lakes is a beautiful example of a floating mat which thus owes its origin to *Carex filiformis*, and similar mats are frequently encountered in other sections of the state. Toward its lakeward margin such a mat is usually thin, but farther away from the edge it reaches a thickness of two feet or more and becomes firm enough to support considerable weight. For some distance from its outer margin, in cases where it is typically developed, the mat is actually floating and is underlain by clear water.*



But in proceeding from the margin shoreward the water underneath is found to become more and more full of finely divided matter until, at a variable distance from the water's edge, the deposit is nearly solid and the mat no longer floats. The filling up of the open water underneath, and the ultimate grounding of the mat is brought about very largely in the manner already suggested, namely, by the dropping down of debris from the lower surface of the raft.

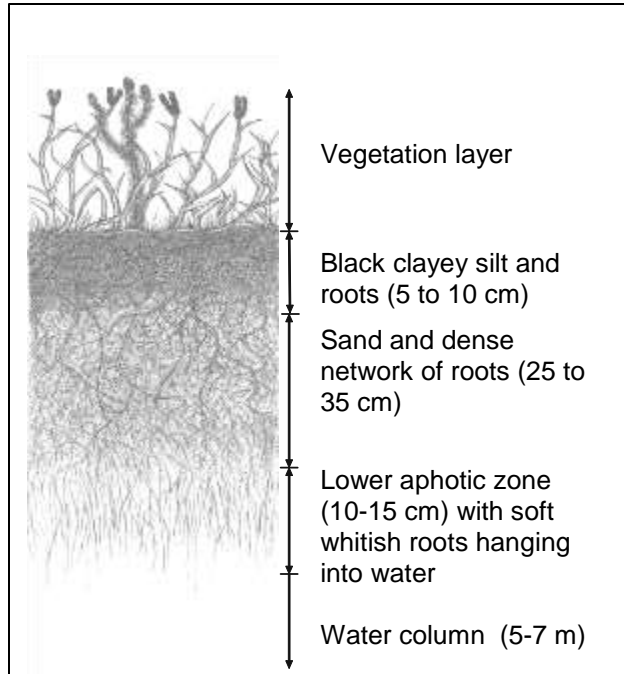
For different type of succession, we can turn to southern India, where rice fields abandoned in the past 30 years -- nearly 30 percent of the total area -- have substantially contributed to the recent formation floating islands in the Kuttanad–Vembanad Wetland Ecosystem, as documented by C.M. John, Joby Paul, V.P. Syllas and K.S. Unni in "Floating Islands in a Tropical Wetland of Peninsular India," Wetlands Ecology and Management 17:6 (December 2009). The authors describe the process in terms of three types of floating islands.

A Type III floating island is a seasonal floating mat that appears in cultivated rice fields and canals during the off-season, mostly a product of decomposing organic matter in the irrigation channels, ditches and nearby fallow areas that floats when water is introduced into the field. Discontinuous pieces of these mats, cut free to expedite the drainage through openings in the earthen bunds, float in the following season to downstream waterbodies, where they establish themselves as a permanent feature leading to Type-II sudd.

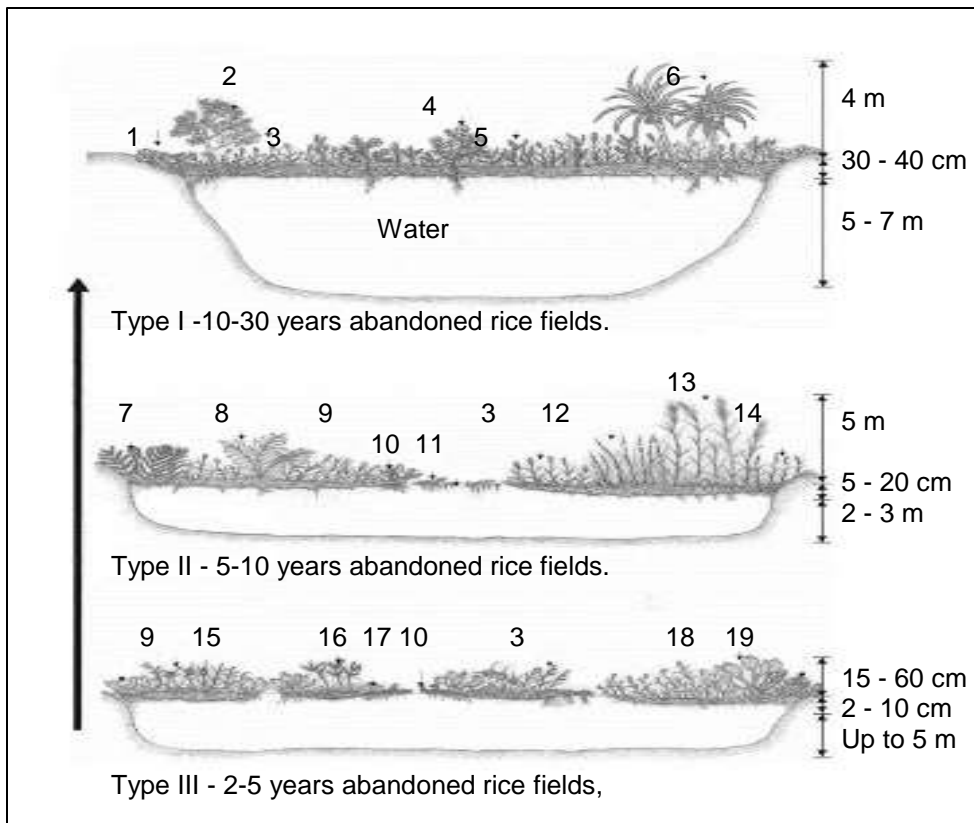
A Type-II island is a permanent 10 to 15-centimeter-thick mat of partially decayed organic matter with greenery above and roots below. The landscape is one of blocked canals. Stepping on such a mat, one's feet become submerged, but the problem can be avoided by a 1 to 2 meter board on the mat, the method by which the local people stand to cut fodder grasses.

Type-I islands evolve from type-II mats as a climax community formed in comparatively deep and old rice fields abandoned for 30 to 40 years. The floating mass is 30 to 40 centimeters thick. Earthworm castings can be seen on the surface. Stepping on the floating island makes a 2 to 3 centimeter depression.

To the right is a sketch of a Type-1 composition, not to scale.



The arrow indicates the direction of succession



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1. Colocasia esculenta	11. Azolla pinnata
2. Shizigium travancoricum	12. Typha elephantina
3. Ischaemum travancorense	13. Phragmites karka
4. Melastoma malabathricum	14. Sacciolepis interrupta
5. Lycopodium cernum	15. Cyperus cephalotes
6. Pandanus odorattisimus	16. Cyperus platystylis
7. Cyclosorus interruptus	17. Pistia stratiotes
8. Acrostichum aureum	18. Limnocharis flava
9. Eichhornia crassipes	19. Ceratopteris thalictroides
10. Salvinia molesta	

The Norfolk Broads are a network of mostly-navigable rivers and lakes in the English counties of Norfolk and Suffolk. Floating fringes of reeds, locally known as "hover," are common, in which a *Glyceria maxima* mat is protected by an offshore fringe of *Phragmites*. Below the hover, autogenic peat accumulates. Toward the raft's inland edge, build-up and compaction, together with deposition of tidal mineral sediments, establishes conditions for terrestrial fen. The mat's ability to move 50 centimeters vertically encourages vegetation by reducing both surface drying and deep inundation.

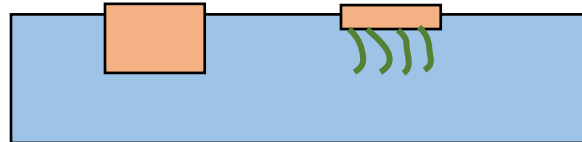
Once formed, mats can increase in thickness, as noted by William Garstin in Report as to Irrigation Projects on the Upper Nile (1904).

A strong gale may set hundreds of acres of these floating masses moving in one direction. When the surface of the water is blocked, the succeeding masses get sucked down, until at last the whole becomes wedged into one solid block... not infrequently attaining a thickness of 5 meters.

"White Lake," Milwaukee Daily Sentinel and Gazette, February 21, 1856, provides a set of overall dimensions.

Just back of Mr. Grover's house is a remarkable spring about 100 feet in diameter, and with water 22 feet deep... In the spring is a floating island some 15 or 20 feet in diameter, with soil of the depth of 12 feet, and a fine thrifty tree about 4 inches in diameter growing upon it just as natural as life. The island floats from one side of the spring to the other, and is frequently used as a boat to sail on this miniature lake.

As the 15 or 20 x 12 cross-section seems uncommonly blocky for a floating island, most of the reported thickness is probably trailing roots.



As the mat's lower stratum decomposes and becomes unbound, entrapped particulates fall free, as noted in "Village Brevities," Cooperstown Glimmerglass, August 9 1915, a report about Goodyear Reservoir, New York.

An attempt was made on Saturday to dislodge the, obstruction by breaking it up and allowing it to go over the dam. The most serious interference is caused by the gravel and small stones dropping from the bottom of the island and getting into the turbine wheels.

Mat thicknesses approaches a steady-state.

Some floating islands, in fact, persist for long period with little more than seasonal change. For aq example, we'll go to India.

The floating island in India's Lake Khajjiar is about 15 meters long, 10 meters wide, and 2 meters in thickness, of which 50 centimeters rises above the water surface. Pollen samples indicate that the island dates before 700 AD.

The mat consists of the reed *Phragmites communis*, vegetation that does not now grow on the fringes of the lake, but may have been harvested for thatching at the establishment of Khajjiar village, or consumed as fodder for domestic animals.



The lake cavity has shrunk by infill of peaty sediment, but the island itself has changed little over the past decades. Below, 1970 and today.



What changes over the year is the island's greenness



Some travel commentary,

1999, *The lake, which used to be in the middle of the saucer-shaped meadow with a floating island, is today nothing but slush.*

2014, *There is a small lake in the center of the saucer shaped meadow which has in it a floating island. Much of lake has degenerated into slush because of heavy silting during rains still the landscape of Khajjiar is picturesque & a photographer's delight.*

2015, *There is a clump of reeds and grasses exaggeratedly called an island floating on this lake adding charm to the eye of the viewer.*

As the lake itself may be in dire straits, its floating island may be in jeopardy through no fault of its own.

J.M. Lambert's "The Distribution and Status of *Glyceria maxima* (Hartm.) Holmb. in the Region of Surlingham and Rockland Broads, Norfolk," Journal of Ecology 33.2 (1946) describes another mechanism of island formation.

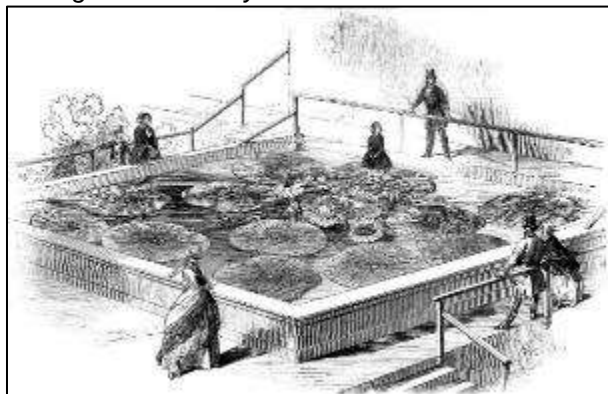
Patches of free-floating hover may become temporarily stationary in several successive places, caught by local shoals or entangled among Phragmites reedstools, before finally reaching positions where they can obtain firm lateral anchorage. Even while still unattached, they may increase considerably in extent, although their exposure to natural mechanical forces on all sides renders them still more liable to disintegration in this state.

*A floating *Glyceria* island of this type, originally some 8 m. in diameter, which was noted in October 1939, in a sheltered region of The Bays, Wheatfen, persisted and increased in extent until it was finally removed and disintegrated by the high flooding tides of January 1943 already referred to a similar, much more extensive island was observed, in the summer of 1943 lodged on a shoal towards the northern end of the present Surlingham Broad.*

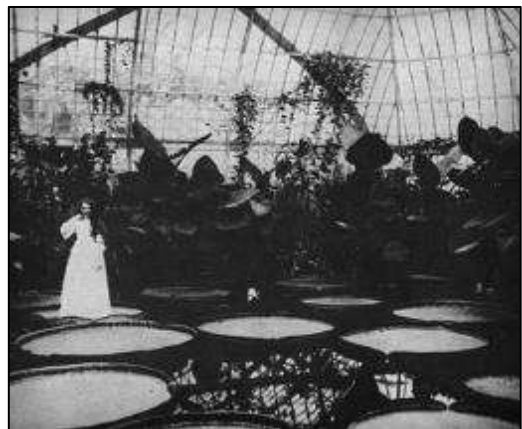


This remained in position throughout the winter of 1943-4, but at some time during the following summer became detached from the shoal, and the whole mass (estimated to be at least 25 m. long by 10 m. wide) drifted about the Broad until in August 1944, it finally broke up into two separate portions which eventually became lodged in relatively sheltered corners.

A class-unto-itself vegetative floating island would be the *Victoria Regia* water lily, up to 3 meters in diameter and capable of supporting as much as 70 pounds. The Amazonian plant was a great curiosity to Victorian Europe.



Illustrated London News,
November 17, 1849



When during high water, lakes within the floodplains of central Amazonia and on the upper Parana are connected by channels to the main rivers, the grasses form floating mats with submersed rhizomes and roots. Lago dos Patos is described as having a floating mat 200 meters wide, 3 kilometers long and more than 4 meters thick.



Near Manaus, a floating meadow dominated by *Paspalum repens* and another dominated by *Salvinia auriculata* and *Reussia rotundifolia*.

A few early reports, beginning with Frank Vincent's *Around and About South America: Twenty Months of Quest and Query* (1890),

The current is strong three or four miles an hour-and carries along fruits, stalks, huge logs, and a great many large islands of grass and reeds, like those in the Paraguay River to which I have heretofore alluded, save that here many of them were forty or fifty feet square.

The current of the Orinoco does not carry down the great number of grassy islands and tree-trunks that one sees always on the Amazon.

Richard Spruce, *Notes of a Botanist on the Amazon & Andes* (1908),

The Grass-islands of the Amazon... are compact masses of grass, in a growing state, varying from 50 yards in diameter to an extent of several acres. The circular Grass-islands are mostly the product of lakes, whose outlet has become silted up during the ebb of the river, and is not reopened until the waters, having already risen considerably, burst the barrier and rush like a cataract into the lake, liberating the Capim, whirling it round and round, and finally carrying it off to the Amazon. I have been in no small peril from the irruption of the Amazon into one of these closed channels, as I shall have occasion to relate shortly.

*Grass- islands are often of immense thickness. One which I examined on the upper Amazon consisted entirely of *Paspalum pyramidale*. After many futile attempts, I succeeded in drawing up an entire stem of the grass, which measured 45 feet in length and possessed 78 nodes, so that, making all allowance for the tortuosity of the stems, the island could scarcely be less than from 20 to 30 feet thick.*

In *The Sea and the Jungle* (1913) January 11 entry, Henry Tomlinson describes islands floating on the Amazon.

We passed numerous floating islands (Ilhas de Capim) and trees adrift, evidence, the pilots said, that the river was rising. These grass islands are a feature of the Amazon. They look like lush pastures adrift. Some of them are so large it is difficult to believe they are really afloat till they come alongside. Then, if the river is at all broken by a breeze, the meadow plainly undulates. This floating cane and grass grows in the sheltered bays and quiet paranas-miris, for though the latter are navigable side-channels of the river in the rainy season, in the dry they are merely isolated swamps. But when the river is in flood the earth is washed away from the roots of this marsh growth, and it moves off, a flourishing, mobile field, often twenty feet in thickness.

Descriptions of Africa's Lake Chad offer additional detail. "Kirtas" consist of an outer ring of *Vossia cuspidata*, a middle ring of *Cyperus papyrus*, and a central core of *Phragmites australis*, with the papyrus forming the buoyant islands' backbone.

Sylvia Sikes, Lake Chad (1972),

Due to the constant fragmentation of clumps and rafts of floating vegetation that break away from the anchored floating islands, one frequently encounters vagrant "mini-islands" in one's course, or as now when running before the wind, accompanying one alongside. Most of these, however, travelled more slowly than the yacht under full sail, and we quickly outstripped them.

Andre Ittis, and Jacques Lemoalle, "The Aquatic Vegetation of Lake Chad," in Lake Chad: Ecology and Productivity of a Shallow Tropical Ecosystem (1983), J.P. Cannouze, J.R. Durand, and C. Leveque, eds

*Some floating islands detach from the reed islands or from the vegetation borders of the islands and archipelago peninsulas and float away as they are pushed by the wind. Consisting most often of *Cyperus papyrus* and more rarely of *Phragmites* or *Vossia*, these islands are usually circular and are locally called "kirtas."*

Their size varies from a few meters to several hundred meters. At the time of the reversal of the dominant winds, during June and October and generally in the rainy season when the wind shifts are frequent during tornadoes, these islands move back and forth, modifying the aspect of the reed islands and closing the channels of the archipelagoes. The composition of the vegetation on these islands is similar to that seen on the reed islands.

The kirtas were very numerous especially in the archipelago of the south basin until 1967 and the boats in route to Bol were often blocked for several days by the floating papyrus. These islands disappeared fairly quickly when the average level of the lake decreased below 282 m.

The Future is an Ancient Lake Traditional Knowledge, Biodiversity and Genetic Resources for Food and Agriculture in Lake Chad Basin Ecosystems (2004), Caterina Batello, Marzio Marzot, Adamou Touré and Peter Kenmore

The floating islands are dense and compact enough to bear the weight of the timid standing gazelle, enough to support the weight of the cattle that graze here, and enough to support the weight of a fisherman, when the only way forward into the open water is to get out of the boat and physically push the islands away with long poles.

Sometimes the canoe gets entangled, squeezed between islands propelled by the wind, as if trapped by ice floes in the northern sea.



*Luckily, we moved forward, albeit at a painfully slow pace for kilometers, awe-struck by the giant papyrus that towers over our heads. We find ourselves constantly bumping into the light trunks of *Aeschynomene elaphroxylon*, covered with yellow flowers that open like butterfly wings. The sides of the canoe brush noisily against the thick reeds, grasses and rushes that grow around us.*

Referring to satellite imagery,

From up there, the immense masses of vegetation that you see seem like solid ground, but instead they are all kirta, the floating islands. Underneath them is water.

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CHAPTER 22.5 ASK IF PEAT'S THERE

Peat

Peat is an accumulation of partially-decayed densified vegetation. Sphagnum, a genus of more than 100 species of mosses, is typically the principal component in the formation of peat bogs and mires.



Peat cutting in Ireland

Undecomposed peats contain large pores which can hold water exceeding 20 times its dry weight. With increasing decomposition, the fiber content decreases, resulting in increased bulk density and a greater proportion of small pores. Highly decomposed peat yield less than 10 percent of its water to drainage, and slowly at that.


Sphagnum dominance results in biotic acidification within a raft's interior. Peripheral segments of the raft in contact with surface water have somewhat higher pH. Sphagnum and the peat formed from it decay slowly because of the phenolic compounds embedded in the moss's cell walls.

The range of bulk densities is reflected in the two tables that follow.

Species	Bulk Density, g/cc
Sphagnum moss peat	
Live, undecomposed mosses	0.010
Undecomposed mosses	0.040
Undecomposed mosses	0.052
Moderately decomposed with wood inclusions	0.153
Woody peat	
Moderately decomposed	0.137
Moderately well decomposed	0.172
Herbaceous peat	
Slightly decomposed	0.069
Moderately decomposed	0.156
Decomposed peat	
Well decomposed	0.261

Source: "Important Physical Properties of Peat Materials," Proceeding of the Third Annual Peat Conference, Quebec (1968), by D.H. Boelter

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	Zone	Species	Bulk density, g/cc
	Capitulum	S. Fuscum	0.0184 - 0.0620
		S. Riparium	0.0164 - 0.0392
		S. Warnstorphii	0.0145 - 0.0191
	Live Part	S. Fuscum	0.0104 - 0.0467
		S. Riparium	0.0046 - 0.0307
		S. Warnstorphii	0.0295 - 0.0328
		N.D.	0.0201 - 0.0388
	Dead Fabric	N.D.	0.1013 - 0.1196
	Humic Peat	N.D.	0.9700 - 1.0200

Source: "Moisture Content Measurements of Moss (*Sphagnum* spp.) using Commercial Sensors," *Permafrost and Periglacial Process* 15:309 (2004), by Kenji Yoshikawa, Pier Overduin and Jennifer Harden

Floating peat mats consist of thin, flat, loosely-consolidated skims of peat and vegetation coalesced along calm margins of lakes, ponds, and slow-moving streams. Peat mats are transitional between the aquatic bed or emergent marsh communities in deeper water and the thicker, more consolidated, peat landward.

The depth of the floating peat mat ranges from a few to more than 100 centimeters. The surface is flat with occasional low micro-relief.

Lokka Reservoir, the largest man-made lake in Finland, covers 41,700 hectares. Some 80 percent of the watershed has a peat horizon at least 2 meters in thickness. *Carex* and *Carex-Sphagnum* peat islands began to rise two years after reservoir construction and covered one-fifth of the water surface by the fourth year. Today's floating islands can be as large as several hectares, 30 to 120 centimeters thick, and support stands of birch.

As Lokka is well studied, we'll note few metrics for general reference.

Wet Weight	< 1 gram/cubic centimeter,
Dry Weight	< 0.110 grams/cubic centimeter,
Water Content	> 88 percent of wet weight,
Porosity	> 0.93
Gas Content	> 43 liters/cubic meter
Degree of Humification	< H5, where
	H4 is Slightly decomposed peat which, when squeezed, releases muddy dark water. No peat is passed between the fingers. Plant remains are slightly pasty and have lost some identifiable features.
	H5 is Moderately decomposed peat which, when squeezed, releases muddy water with a very small amount of amorphous granular peat escaping between the fingers. Plant structure remains indistinct, although it is still possible to recognize certain features. Pasty residue.

Schwungmooren comprise a floating raft of peat covered by mire vegetation. The dominant *Sphagnum* vegetation with its associated bog flora and partly ombrotrophic (rain-fed) hydrology represents a mature stage in the hydrosere and will usually have developed on top of a pioneering sedge raft in contact with groundwater.

As the bulk density of peat increases with decomposition and densification, peat's propensity to float decreases with age, and more so if soil particles are retained within the structure. When inundated, older peat remains on the bottom. Older peaty matter washed into a waterbody sinks to the bed.

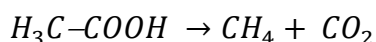
Were that the end of the story, we'd have no floating islands of peat.

But indeed we do have such islands, many of them, in fact.

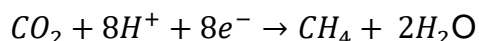
Peat islands float to the surface for two reasons,

1. Fluctuating water level. When lake beds with high organic (especially peat) deposits are exposed to air for prolonged periods, the sediments dry and the density drops. If the water level increases too rapidly for the sediments to re-saturate, the stratum can float to the surface.
2. Methanogenesis, the natural process of methane production within the mat. Entrapped gas buoys peat matrix to the surface.

Methanogenesis prefers an oxygen-poor environment. Because microbes dwelling in warm, moist environments consume oxygen more rapidly than can be diffused in from the atmosphere, wetlands tend to be oxygen-scarce, allowing archaea to ferment acetate and H₂-CO₂, a process known as acetoclastic methanogenesis.



The archaea then oxidize hydrogen with carbon dioxide, a process called hydrogenotrophic methanogenesis.



The right-hand side is peatland's contribution to global warming. Floating Peat Island Formation at an Experimentally Flooded Wetland: Impacts on Methane and Carbon Dioxide Production and Flux Rates to the Atmosphere (1997) by Christine Poschadel describes the flooding of the wetland in which gasses eventually released from floated islands contribute 70 percent of the entire flooded wetland's CH₄ "ebullition" to the atmosphere.

Methane production is inhibited by low pH, sulfate pollution, low bicarbonate levels and strongly humified peat matter.

In 1924, portions of a 500-year-old canoe, 4 feet in width and capable of 20 passengers, were recovered from beneath the floating mat of New Jersey's Glen Wild Lake. The mat was likely so densely affixed to the lake bed, 60 to 400 feet below the surface, that enmeshed detritus isolated the artifact from oxygenated water.

The component making the greatest buoyancy contribution of the Typha mats of the Hog Lake impoundment, New Brunswick, is the rhizomes, but in older and thicker mats, the living Typha becomes less important to buoyancy than the entrapped gas bubbles from decomposition, nitrogen and methane are the major products. There is less methane at cooler temperatures; samples of laboratory-incubated Typha mat reached a gas content of 13.7 percent of total volume at 22°C, but only 6.2 percent at 2°C.

Masses of buoyant peat arising from the inundation of peatland during reservoir construction can create significant management problems. The significant issue is the emission of methane from these buoyant masses, can shift a wetland from functioning as a carbon sink to becoming a source of greenhouse gas. In Ontario peatland, 65 to 90 percent of methane production is oxidized before being emitted to the atmosphere during pre-flooding conditions. The figure is falls to around 30 percent for floating peat islands formed as a result of impoundment.

In lakes with high sediment organic content, accrued gasses can lift small (generally less than 2 square meter) patches of decomposing peat and other fibrous material to the surface. The process may be favored by shallow water conditions. Initially isolated and mobile, the liberated masses tend to coalesce along shorelines or emergent vegetation boundaries to be eventually colonized by wetland or even upland plant species. Few peat rafts get thicker than 0.5 to 1 meter, a consequence of material being shed from the base.

In the Everglades, buoyant peat masses are called "pop-ups". In Okefenokee Swamp, they are known as "batteries."

A floated island may not be long lived, however, as the entrapped gasses will eventually escape and the matrix will become increasingly waterlogged.

Patricia Vorst, in Thirlmere Lakes, N.S.W.: Geomorphic Environment and Evolution (1974), describes the combination of water-level variation and methanogenesis.

1. Peat accumulation in the lakes proceeds via decay of stems and leaves of aquatic vegetation. As this is restricted to the margins of the lakes, then accumulation is more rapid here than in the center.
- 2a. Water level falls, exposing the peat; when water level rises again, islands break off at a level governed by some unknown factor; or
- 2b. Water level fluctuation causes the death of the reed rhizomes which had been binding the peat. Rhizome decay proceeds until the buoyancy due by the accumulation of gases in voids within the hollow reed is sufficient to float the peat to the surface.
3. Post-flotation processes, such as periodic wetting and drying and colonization by secondary vegetation, proceed. The dominant Sphagnum moss, with its associated bog flora including such species as cranberries (*Vaccinium* spp.), bog rosemary (*Andromeda polifolia*, *A. glaucophylla*), sundews (*Drosera* spp.) and sedges such as *Carex limosa*, represents a mature stage of vegetative succession.
4. As the peat subsequently decays, the air spaces become fewer and the accumulated gases dissipate, resulting in gradual submergence and possibly the sinking of the island. Creation, evolution and sinking of the peat islands is a cyclic process, the recurrence interval governed by changes in water elevation.

For another example, that of a floating mat formed around 1830, probably as a result of land clearing, we've "Post-Glacial Development of a Kettle-Hole Peatland in Southern Ontario," Ecoscience 4:3 (1997), by Daniel Campbell, Hamish Duthie and Barry Warner. Kettle-holes are landform depressions resulting from blocks of ice calving from the front of a receding glacier and becoming partially or wholly buried by glacial outwash. Floating marshy mats of thin, flat, loosely consolidated skims of peat and vegetation form along the calm margins of lakes, ponds, and slow-moving streams. The depth of such mats ranges from a few centimeters to several meters.

From The Peat Deposits of Minnesota (1919) by Edgar Soper,

At the margin of lakes and ponds, and shoreward from the rushes, cattails, reeds, or wild rice, there is usually a well-defined zone of sedges, of which various species of carex are most common.

The sedges, because of their strong, tough, branching, underground stems and roots, often take complete possession of the bottom around the shores, and gradually form a firm, tough turf. As this turf grows in thickness and strength by constant additions to its mass, it may finally become so strong and buoyant that it builds a floating mat or shelf around the margins of the lake.

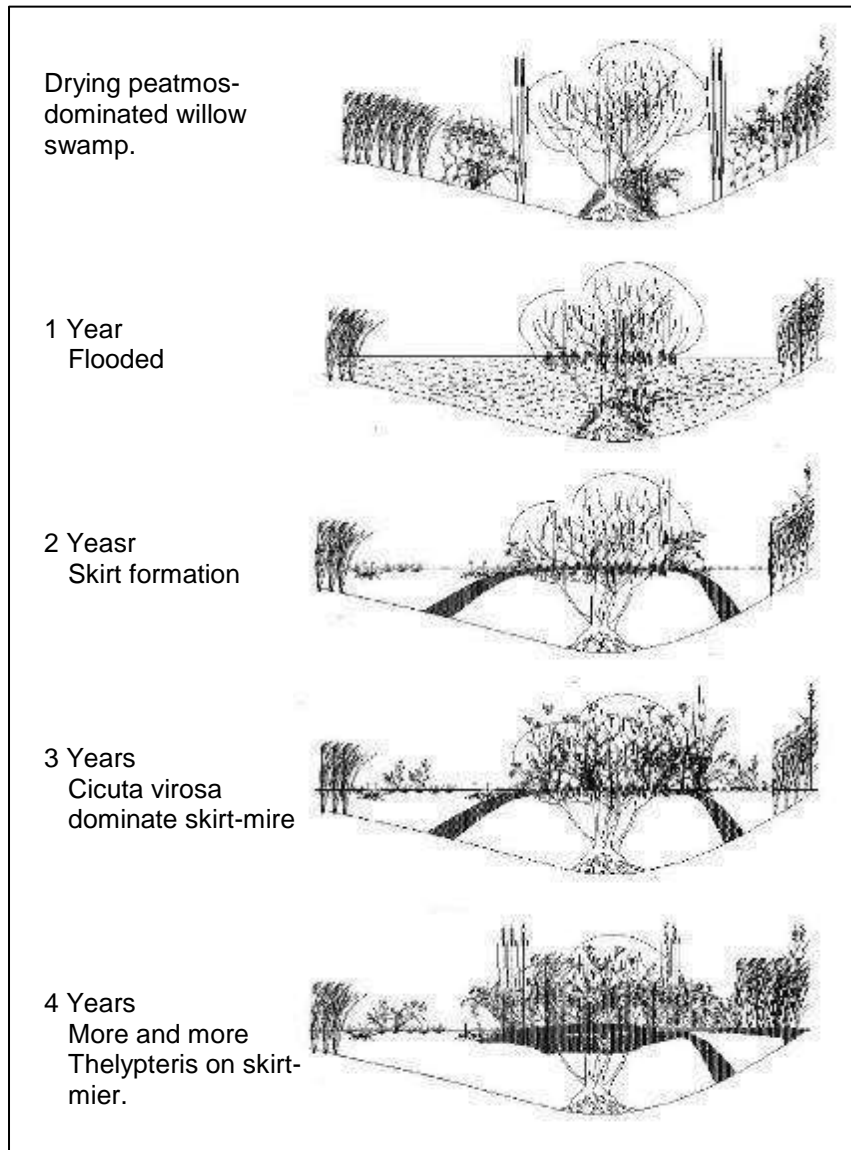
Upon this sedge mat other plants take root and the peat is thus built up as a thick mat floating on the remnants of the lake. Several such deposits were found by the writer in northern Minnesota. The floating peat mats varied in thickness from 1 to 15 feet.













Once active, peaty mats may encroach upon open water at a rapid rate. Surfaces of some Cheshire kettle-hole lakes were enshrouded within a within a decade. At Scouts Wood in Delamere Forest, a pool 100 meters wide and 2.5 meters deep became overgrown within 40 years.

Succession from peat cutting to a climax Sphagnum-Eriophorum vaginatum quaking mire has occurred in central Russia in just 30 years. Initial colonization was by aquatic macrophytes including Equisetum fluviatile, whose rhizomes provide the bog vegetation a substratum on which they can fix themselves. The colonization of Equisetum was often accompanied by the spread of a mossy carpet over the water surface, typically formed by Hypnum aduncum and Sphagnum teres. This eventually succeeded to a transition fen of Carex rostrata and C. lasiocarpa. Other pits were colonized from the edges by floating Sphagna and C. rostrata, forming rafts covering hundreds of square meters.

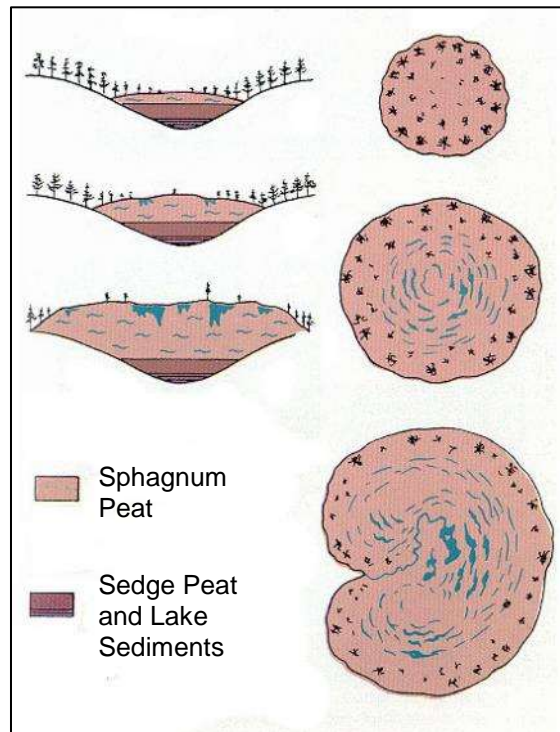
Northern European schwingmooren and the floating bogs of North American kettle-holes are functionally equivalent. Common flora includes many species in common including cranberries (Vaccinium spp.), bog rosemary (Andromeda polifolia, A. glaucophylla), sundews (Drosera spp) and sedges such as Carex limosa.

Formation as a successional of skirt mire, 4 years of Hungarian observation



 Peatmosses (<i>Sphagnum squarrosum</i> , <i>Sphagnum fimbriatum</i> supp. <i>fimbriatum</i>)	 <i>Polygonum lapathifolium</i>	 <i>Cicuta virosa</i>	 <i>Glyceria maxima</i>
 <i>Typha angustifolia</i> <i>Typha latifolia</i>	 <i>Carex pseudocyperus</i>	 <i>Phalaris arundinacea</i>	 <i>Thelypteris palustris</i> <i>Dryopteris cartusiana</i>
 <i>Lemna minor</i> <i>Hydrocharis morsus-ranae</i> <i>Salvinia natans</i>	 <i>Stratiotes aloides</i>	 <i>Utricularia vulgaris</i>	 Plant debris, peat

Repeated inundation can cause a poorly-drained waterbody becomes a marsh, and then a bog, as silt and peat fill the depression. When the buildup is high enough that ground or surface water cannot reach its center, the formation becomes wholly rain-fed (ombrotrophic) and the resulting acidic condition allows as much as a few meters of further peat growth. The resulting dome is often encircled by strips of fen or other wetland.



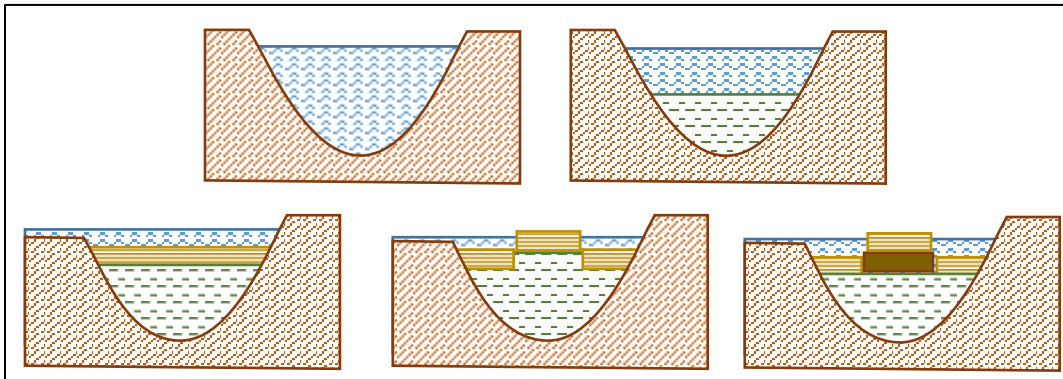
Of the 286 communities in the British National Vegetation Classification, 38 pertain to mires (the Ms), 28 to swamps (the Ss) and 25 to woodland and scrub communities (the Ws). Surprisingly to a casual observer -- though perhaps not to a botanical taxonomist -- a schwingmooren falls within the latter group. Below are the BNVC communities most-likely to feature floating vegetation.

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W2b Sphagnum	Peat levels isolated from effects of ground water; either where peat accumulation has raised levels, or on floating peat rafts where the peat level is above water level.
S9 Carex rostrata swamp	Shallow, oligotrophic to mesotrophic standing waters, usually with organic substrates.
S10b Equisetum fluviatile swamp	Sometimes occurs as a swinging, semi-submerged vegetation.
M5 Carex rostrata – Sphagnum squarrosum mire	In mildly acidic, moderately calcareous and nutrient-poor waters. Frequently, the mat is bound together by robust rhizomes and rises and falls with water level.
M9 Carex rostrata – Calliergon spp. mire	In mesotrophic conditions. Vegetation often develops as a floating or semi-floating raft which can rise and fall with water level.
S27 Carex rostrata – Potentilla palustris tallherb fen	As above

"A Layer of Sand Raised above Water Level by Gases," *Bulletin of the American Geographical Society of New York* 43:1 (1911) describes the floating and subsequent fixation of an island in northwestern Germany.

On Oct. 23, 1910, an island, 230 by 100 feet in dimensions, appeared on the surface of the Ogel Sea, a small lake near Beeskow in the province of Brandenburg. The investigations of Prof. Potonie, the botanist, showed that it owed its origin to the buoyancy of gases. The lake originally did not drain into the Spree River. Its depth amounted to about 100 feet, which was gradually decreased to 13 feet by the accumulation of decomposed vegetable and calcareous matter. Subsequently a connection was established between the lake and the Spree. This resulted in the deposition of a stratum of sand, which gradually accumulated to such a degree that the gases forming in the mud at the bottom of the lake could no longer escape. The pressure of the gas finally became so great that it was able to raise the layer of sand above the level of the water, thus creating an island. Mud flowed into the void caused by the uplifting of the sand stratum. The island is thus not a floating island, as has been proved by boring.



"The Stratigraphy and Development of a Floating Peatland, Pinhook Bog, Indiana," by Douglas Wilcox and Howard Simonin,

Pinhook Bog is an acidic, weakly-minerotrophic peatland that occupies an ice block depression in the Valparaiso Moraine in northwest Indiana. It has a floating mat approximately 22 ha in area but no central pond.... Stratigraphic data along four transects identified a clay-lined basin with three major sub-basins, 18, 14 and 14 m deep. The deeper parts of the sub-basins contain fibrous limnic peats with some intermixed lacustrine sediments deposited between 12000 and 4200 years ago. The younger upper peat layers are composed primarily of Sphagnum and consist of the fibrous surface peat and two underlying layers of fluid, fibrous peat separated by

a water layer about one meter thick. Peat materials from above the water layer have fallen through the water to form the lower layer of detritus peat.

Atolls

Our next mechanism of formation is but a particular form of peat and buoyant vegetation activity, but one with a unique spatial characteristic in the succession. A sphagnum atoll is a bog surrounded by a trench of stagnant water. In the center of the bog the remains of the original pond may or may not be present. Most mats grow outward from the shore. Atolls form as a vegetative ring within the waterbody.

G.F. Atkinson, in Elementary Botany (1898) describes a "plant atoll" in a small, protected basin near Ithaca, New York. There was a small pond in the center and a shallow ditch around the perimeter. The zone near the ditch was moored to the bottom, but the inner zone floated.

The entire basin was once a large pond, which has become nearly filled by the growth of a vegetation characteristic of such regions. Now only a small, nearly circular, central, pond remains, while entirely around the edge of the earlier basin is a ditch, in many places with from 30-60 cm. of water. There is a broad zone of land then lying between the central pond and the marginal ditch. Just inside of the ring formed by the ditch is an elevated ring extending all around, which is higher than any other part of the atoll. On a portion of this ring grow certain grasses and carices. The soil for some depth shows a wet peat made up of decaying grasses, carices, and much peat moss (sphagnum). In some places one element seems to predominate, and in other cases another element. On some portions of the outer ring are shrubs one to three meters in height, and occasionally small trees have gained a foothold.

*Next inside of this belt is a broad, level zone, with *Carex filiformis*, other carices, grasses, with a few dicotyledons. Intermingled are various mosses and much sphagnum. The soil formation underneath contains remains of carices, grasses, and sphagnum.*

A floating inner zone. -- But the innermost zone, that which borders on the water, is in a large measure made up of the leather-leaf shrub, cassandra, and is quite homogeneous. The dense zone of this shrub gives the elevated appearance to the atoll immediately around the central pond, and the cassandra is nearly one meter in height, the "ground" being but little above the level of the water. As one approaches this zone, the ground yields, and by swinging up and down, waves pass over a considerable area. From this we know that underneath the mat of living and recent vegetation there is water, or very thin mud, so that a portion of this zone is "floating."

The inner, or cassandra, zone is more unstable, that is it is all "afloat," though firmly anchored to the intermediate zone. The roots of the shrubs interlace throughout the zone, firmly anchoring all parts together, so that the wind cannot break it up. Between the tufts of the cassandra are often numerous open places, so that the water or thin mud on which the zone floats reaches the surface, and one must exercise care in walking to prevent a disagreeable plunge. No resistance is offered to a pole two to three meters long in thrusting it down these holes.

Atoll moor, central pond, elevated ring and ditch at original shore line



In the early formation of the atoll, it is possible that certain of the water-loving carices and grasses began to grow some distance (three to four meters) from the shore, where the water

was of a depth suited to their habit. The stools of these plants gradually came nearer the surface of the water. As they approach the surface, other plants, not so strong-rooted, like mosses, sphagnum, etc., find anchorage, and are also protected to some extent from the direct rays of sunlight. Partial disintegration of the dead plant parts and mingling with the soil gradually fills on the inside of the zone, so that the depth of the water there becomes less. Now the zone of the carices can be extended inward.

Murry and Hellen Buells' "Moat Bogs in the Itasca Park Area, Minnesota," Bulletin of the Torrey Botanical Club 102.1 (1975) provides another description.

The rising water table has had its effect on all of these depressions. Where there was a lake surrounded by a bog, the lake level came up and the bog floated up with it. At the older forested margin the water may have flooded the area and killed the trees, as bog forests back on the older part of the bog are often not free to float up with the rising water table.

Where the depression was occupied by a sedge meadow, there were two types of response. In some depressions the sedges were too firmly anchored to the substratum to break loose, and the meadow became flooded, forming a new body of water. But in a large proportion of cases the sedge meadow broke loose and floated up with the rising water.

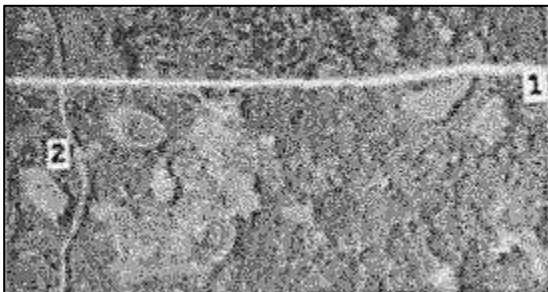
*In 1973 it was easy to cross the moats to the floating mats in both bogs. The moat of **bog 1** was about 5-10 m wide and the depth of the water about 0.5 m, with a soft oozy bottom which needed only a small mass of sticks to support our weight. In 1974 on the same date the moat was wider -- 2.5 meters at one point and 37 centimeters deeper.*

Bog 1 is roughly oval in outline and about 50 m wide at its shortest diameter... A small beaver house 4-5 m in diameter stands on the west side of the mat adjacent to the moat and partly surrounded by a narrow moat. The general aspect of the bog is influenced by the density and vigor of growth of the woody species on it. Shrubs are more abundant and more vigorous adjacent to the moat than at the center of the bog where they are lower and more open. It is probable that the peripheral shrubs had their origin in the near-marginal sedges of the old mat and had not yet anchored firmly in mineral substratum when the water level rose.

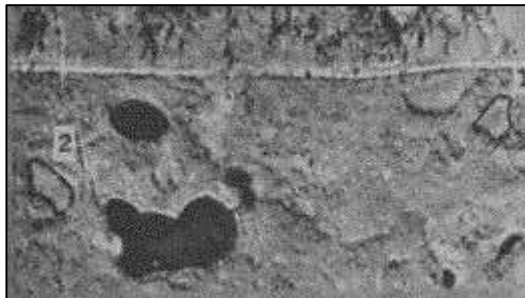
The presence of the three upland species, jack pine, white pine, and red maple was especially interesting. When were they established in this bog? We dug the tallest jack pine, which was thrifty enough to have two good cones on it. Its lower portion was buried by 0.4 m of sphagnum that had grown up around it. A count of the growth rings showed that it became established in or about 1963, probably after the sphagnum had come in and had reduced the vigor of the sedge.

Between 1.5 and 1.8 m depth the deposit was very loose-so loose a sample could not be obtained-the depth remaining constant until close to the periphery of the mat. The peat both above and below this layer was compact. It is our assumption that the zone of loose deposit is the place where the floating part broke free when the water level rose. The greatest depth of the depression was at its center, where it was 3.7 m relative to the present level of the bog surface. The depth was approximately 3-3.4 m half way between center and moat, decreasing to 1.2-1.5 m at 0.5 m from the moat, and to about 0.5 m in the moat at the point of crossing.

The aerial photos are of the site. Bog 1 is to right. Note the successive progression of Bog 2.



August 1939, Dry conditions



October 1951,
Open water due to groundwater rise



August 1966, Atoll formation



Today. Atoll merged with shore

A few other atolls in various degrees of succession.





Rock Lake, with only fringe vegetation, and adjacent Moor Lakes, almost complete atoll-covered.



"The Development of Vegetation in the Morainal Depressions of the Vicinity of Woods Hole", Botanical Gazette 33:6, June 1902, by Charles Shaw, describes an instance Massachusetts.

The Origin of Pond-Islands and Atolls.

In frequent instances the filling-up of the pond takes place in a fashion seemingly paradoxical. Instead of the deposit gradually encroaching from the margin, an island forms in the center and leaves a narrow belt of open water about the edge of the pool.

Fig. 6 shows a case of pond perhaps 15 meters in diameter, near Quisset harbor. That a pond should begin by filling up in the middle is a fact calculated to arouse the curiosity of a layman.

If the pond were larger and deeper than the one shown in fig. 6, a pool would remain in the center and we should have a ring of vegetation between the ditch and the central pool. Indeed there is at least one such veritable atoll in the vicinity at present in question, and it is found in a larger basin, perhaps 100 meters in diameter.



A pair of Minnesotan ponds provide further documentation. We'll draw from both "On the Occurrence of Sphagnum Atolls in Central Minnesota," Minnesota Botanical Studies 9:12 (1898) by Conway MacMillan and "The Origin of Sphagnum Atolls," New Phytologist 15:9/10, November-December 1916, by Harvey Stallard. Unfortunately (and somewhat perplexedly), while the

locations are specified down to the quarter-section by MacMillan, aerial imaging yields no evidence of either pond, past or present. Thus, we cannot bring the reports up to date.

Ballard's atoll in 1898 was in a pond about 450 feet in diameter and almost circular, 4.5 feet deep near the outer edge of ring, 12 feet deep in the center. Black vegetable matter mixed with decomposed sphagnum covered the pond bed. The atoll itself was about 75 feet in diameter and 10 feet wide, one place broken by a channel 12 feet wide.

*When seen from the shore, early in July, the atoll was aflame with the crimson flowers of *Sarracenia purpurea* Linn -- the side-saddle flower, or as more commonly termed in Minnesota, the pitcher-plant. Mingled with the red, and scarcely less abundant, were the white and cottony inflorescences of three different species of *Eriophorum* (cotton-grass).*

In addition to these and forming a matrix upon which they had developed were the same three undetermined species of sphagnum which had been found in small patches outside of the atoll. The general texture of the atoll was loose so that one standing anywhere upon it soon sank into the soft and spongy moss up to the knees

By 1916, the bog was a *Carex-Calamungrostis* meadow in which a few small spruce and tamarack trees remained on sphagnum hummocks.

In 1898, Anderson's atoll was situated in a in a pond 150 feet across and 4 feet average depth. The atoll was 60 feet in diameter. Sphagnum, ledum and black spruces were its most-noticeable plants.

Twenty-seven young black spruce had established themselves upon the atoll. The largest was but four and one-half feet in height, while the smallest noted was not over eight inches. These trees, evenly distributed, occupied the middle of the ribbon of sphagnum and presented a most attractive and unusual appearance, forming as they did an almost perfect ring about the open, placid and central lagoon.

*One could stand anywhere upon it without sinking in above the insteps. This was doubt less due to the firmer interknitting of the roots of *Picea* and *Ledum*.*

By 1916, Anderson bog was a wet meadow with a few sphagnum hummocks here and there, which vary in size from a few square yards up to a few square rods.

MacMillan attributes atoll development to the rise and fall of water.

The origin of the sphagnum atolls in the cases studied may be ascribed to a season of gradual recession of the waters of the pond, followed by a season of comparatively rapid increase in area and level. The atolls first appear as annular floating bogs separated from the shoreward turf as a result of the original zonal distribution of littoral plants and the rise of the waters together with the favorable concurrence of a group of special and necessary conditions.

MacMillan's conditions for atoll-formation:

- A maximum size and depth of the parent pond,
- A considerable height and regularity of the banks of the parent pond,
- A regular and gentle slope of the pond bottom from shore to center,
- A definite original character of littoral vegetation when the pond was at low level,
- A reduction within minimum limits of the lateral pressure and tension of winter ice, and
- A comparatively prompt anchoring of the atoll upon the bottom.

In "Peat," Michigan Geological Society Annual Report (1906), C.A. Davis accounts for atoll in like manner.

In the numerous examples of this [the marginal] part of swamps and bogs of Michigan examined by the writer, it has seemed that the efficient cause in their [the fosse's] production was the fluctuation of the water level through rather brief intervals and the constant recurrence of such fluctuations. These are attendant upon the variations in the rainfall, and the water level

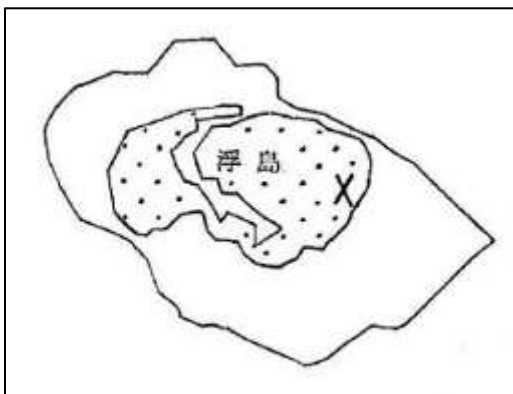
in the lakes, may vary one, two or more feet every few years, and may remain at the low water stage for several years. It is also a matter of observation that, during dry times, the water does disappear from these marginal ditches for long periods during the summer and fall, the bottoms becoming quite dry and this has the effect of destroying much of the hydrophytic vegetation which has established itself and also of thoroughly decomposing and disintegrating the organic matter which has accumulated during periods of high water, thus lowering the surface below that of the area directly above the zone of permanent water, which, being covered by a thicker layer of vegetable debris, is kept wet by the upward capillary movement of the water from below its surface.

Stallard arrives at a different conclusion, one involving fire.

The only agency capable of both denuding and destroying the edge is fire. Fire occurs during or at the end of a prolonged period of drought when the water-level is low. The surrounding soil has no direct influence on the atoll formation, but since desiccation occurs more frequently and to a greater degree in sandy areas than in clay, atolls are more frequent in the former because fires are more likely to occur there.

Carbon-14 Dating

Carbon-14 dating has been applied in both the case of an existing floating island and one evidenced by stratigraphy. "Absolute Age of Floating Island on the Swamp of Futanuma, Fukushima Prefecture," Earth Science 24:1, January 1970 (in Japanese), by Ryosaku Otake, deals with an island currently observed.



Collection point X, 1970



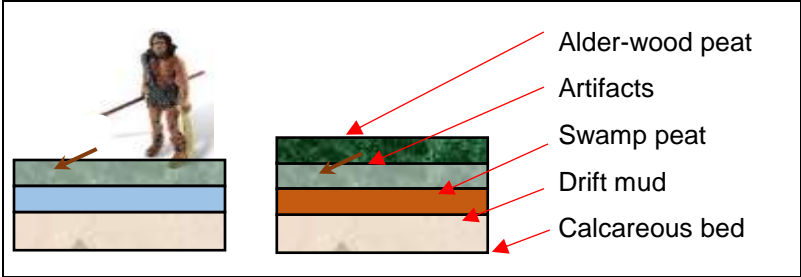
Today

The pond area is 7,000 square meters, with a maximum depth of 5 meters. The sphagnum island is approximately 2,000 square meters, with a thickness between 1.2 and 1.8 meters. Carbon dating suggests an age of 850 AD \pm 90 years.

As exposed peat formations experience ongoing degeneration and regeneration, however, the age of the formation may not be the age of materials now in it. Older detritus may have sloughed off. Sequestered bed material predating island formation may have uplifted into the mass. The millennium-plus estimate should not be taken as island-specific.

J. Troels-Smith, in "Neolithic Period in Switzerland and Denmark," Science 124:3227, November. 2, 1956, dates a once-floating island in Denmark's Aamosen bog to 2740 BC \pm 90. An over-layer of alder-wood peat has preserved the artifacts -- probably deposited in a short period, according to the author -- upon a strata of swamp peat, which in turn overlies 10 to 40 centimeters of drift mud sitting on a floor of calcareous sediment. As the drift mud interposed after the artifacts were deposited, the early humans were dwelling on a floating mat.

Chapter 22.5 -- Ask if Peat's There



Sequence: flooding, peat mat, artifacts, mud intrusion, peat cover.

CHAPTER 23

MIND THE MUSKEG

Muskegs are ombrotrophic to weakly minerotrophic peatlands, receiving inputs of water and nutrients primarily from ion-poor precipitation.

The term is broadly applied to North American boreal swamps or bogs consisting of partly dead vegetation, frequently covered by a layer of sphagnum or other mosses. Muskeg produces floating peat deposits of variable thicknesses because of incomplete decomposition in the wet, acidic environment.

A muskeg may cover large areas, such as in the Hudson Bay lowland, or occur as small, isolated pockets.



Essentially a surface mat floating on a soggy bottom, a muskeg can be treacherous to traverse, as evidenced by the D-6 Caterpillar breaking through a deceptively-secure planar landscape in Alberta



In this chapter we'll visit several such formations

Lake of the Woods, Ontario

For understandable reasons, the town of Rat Portage, Ontario, on the northern end of Lake of the Woods, has renamed itself as Kenora.

Adolph White and Arthur Meyer, Final Report of the International Joint Commission on the Lake of the Woods (1917)

In taking elevations on floating bog..., the rod was pushed down through the floating surface mat or sod by a sudden pressure of from 10 to 50 pounds, depending on the toughness of the sod, until the rod reached the firmer bottom below the underlying muck or ooze. The rod was then raised up by an amount equal to what the rodman, from his experience in pushing the rod downwards, had estimated the thickness of the floating sod to be.

Along other portions of the southerly shore of the Lake of the Woods, the floating bog is continually being broken up by the waves and carried away, partly finely divided, and partly as large floating islands that do much damage to the pond net fishermen.

DRAFT 3/30/2018



Indefinite Shoreline at Edge of Floating Bog or Muskeg -- Stoney Point



Typical "Island" of Muskeg Anchored by Pound Net

"A Floating Island in Rat Portage Bay," Annual Report of the Ontario Department of Mines (1897),

A little way from the mill is the floating island which caused a mild sensation during the past summer at Rat Portage, taking the place of the sea serpent of seaside watering places. The island, which is about four and a half acres in extent, belonged in a bay of Coney Island opposite Rat Portage, but this year's high water lifted it so far off from its moorings that a high wind drifted it right across the harbor to the north shore near the railway. Here the thrifty city fathers had a boom stretched around it to prevent further wanderings.

This movable bit of real estate is said to be twelve feet thick in the middle, but near the edges it thins out to about a foot. The support is of driftwood supplied by the mills, etc., in the harbor. On this foundation reeds and coarse grass with some bushes have taken root, giving the expanse quite the look of a bit of damp meadow. At most points the floating power is scarcely sufficient to support a man. I saw another such floating island on Snake Bay, an arm of Whitefish bay, earlier in the summer, but it was of much smaller dimensions.

"Read Estate Adrift," Ottawa Citizen, August 19, 1897

A floating island has been giving the people of Rat Portage no end of trouble. Recently a rise occurred in the waters of Lake of the Woods, caused by continuous rains. Several acres of a peat bog broke loose from its natural moorings, and was carried out into the lake. It drifted around for some days and finally floated into Rat Portage harbor, blocking up the waterfront so that boats could not reach the main wharf.

The authorities, after wrestling in vain with the unwieldy visitor, appealed to the Department of Marine, and instructions were accordingly wired to the departmental agent to raise the blockage by whatever means he might be able to devise.

Yesterday the Deputy Minister received a telegram from him announcing that he had the island towed out of the harbor and securely moored upon the lake shore, where it will probably give no further trouble.

Ottawa Journal, August 19, 1897

A floating Island from the Lake of the Woods drifted Into Rat Portage harbor and had to be towed out again by the marine department so as to permit boats getting into the wharf.

"Geologists in Canada," Nature, November 18, 1897,

The enormous water-power which the Lake of the Woods contains, has to a slight extent already been utilized at one or the other outlet, in the production of an electric supply for the city, and for driving extensive flour-mills at Keewatin. But a fine dam is now nearly finished by which the whole outflow will be made available for industrial purposes... The navigation of the lake between Rat Portage and Keewatin had lately been much impeded by a floating island of vegetation, but this, as we saw, had been surrounded with a boom of logs, and fixed to the shore.

"The News of the Day. A Few Brief Paragraphs for Busy People," Qu'Appelle Progress, August 26, 1897,

Major Gordeau, deputy minister, has ordered the Rat Portage floating island to be towed to a place of safety.

"Hydraulic Power Development by the Town of Kenora," Engineering News Record, July 18, 1908

A great deal of trouble was experienced in the construction of this dam, as the current was fairly swift at this location and the cribs were placed on a deposit of gravel and boulders of unknown depth, which washed out more or less and caused very extensive undermining of the cribs. This difficulty was at length overcome by the ingenious expedient of collecting large sections of a floating island, consisting of entwined roots and weeds, which had formed the top of a muskeg and had floated down the lake to a point near the development, and sinking these sections in front of the coffer dam.

"Island Appears in Rainy Lake," Lethbridge Herald, August 16, 1949, near Fort Frances,

Persons familiar with the area rubbed their eyes in disbelief. But, that still didn't change the situation -- here stood an island where only open water had been before.

The oddity occurred this last week-end on the north arm of Rainy Lake here. Fishermen reported on return that the island had lodged in the 10-mile open stretch in the north arm. It was about the size of a city block. Investigation showed the island was a floating bog that had broken away from its main body in one of the large bays. The bog had trees seven to eight feet tall growing in the center.

Winnipeg Free Press, September 14, 1950

The dominion department of public works has promised to anchor Lake of the Woods' floating island. The seven-acre muskeg, which floats around with every change of the wind, is a menace to navigation.

Jumping to the recent past, "City Thanks Volunteers for Bog Clean-Up," KenoraOnline.com, June 20, 2014,

City crews work with local businesses and residents, in order to help clean-up the bog on Laurensen's Creek. The floating mats have been an issue for navigation in recent years.

The City of Kenora is thankful to the great partnership formed for the removal of the bog from Laurensen's Creek on Wednesday. Citizens from Laurensen's Lake, Laurensen's Creek, and businesses such as K-Sports and Green Adventures are working diligently today to work with the city on the removal.

Citizens assisted with their boats in pushing the bog as well as financially to assist with the cost of the removal. This truly is a display of a great community partnership with the city.

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This citizens group along with the city will be working on a proactive plan once this main removal is complete.



"Floating Island Makes It Through Norman Dam," KenoraOnline.com, June 25, 2014

A massive piece of detached land floating down Lake of the Woods has made it through the Norman Dam.

Public works crews from the City of Kenora and firefighters were aware of the problem, and they followed the island through the dam. There was concern that if it got lodged in the gates of the dam, it could cause damage.



Fortunately, there appears to be no harm, because the island broke up into smaller pieces, before slipping through the dam.



Video footage of a fragment



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Chapter 23 -- Mind the Muskeg



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From "Levels on LOW Slowly Declining,"
KenoraOnline.com, July 8, 2014,

A giant mud bog crashed into a dock due to high water levels causing large chunks of bogs to break off and float around Lake of the Woods..



July 8, 2014, a larger floating island



July 19, 2014, a 6 foot long floating island

"Mudd Portage Blocked by Giant Mud Bog," KenoraOnline.com, July 10, 2014,

Kenora OPP and the Marine and Trails Unit are reporting that Mudd Portage is completely blocked by a mud bog. The bog is approximately 200 meters by 200 meters in diameter.

"Floating Bog Blocks Narrows on Lake of the Woods," KenoraOnline.com, July 15, 2014,

Members of the OPP are advising the public to use caution, while travelling in the area of French Portage Narrows on Lake of the Woods. At this time, French Portage Narrows may be blocked by a mud bog that's approximately 80 m x 80 m in diameter.

The OPP is reminding boaters that with the high water and wind conditions, bogs have been breaking off and they may affect your travels.



Island Falls, Ontario

The Island Falls Generating Station is a four-unit hydroelectric station built in 1925, 30 kilometers north of the confluence of the Abitibi and Frederickhouse Rivers.

When the dam was completed in 1925, an flooded island tore loose from the bottom and floated downstream.



From W.R. Carr, "Floating Island," Canadian Magazine,

The dam was completed, the stop-logs inserted and the water, checked in its course, began to rise. Gradually it crept back to the island and those who watched said to one another, "Poor old island, to have guarded these rapids so long and now be forced to submit to such an inglorious end as drowning!"

But the Island was determined to make one last stand against the inroads of modern civilization. Summoning all its strength for one mighty effort it tore its roots free from the rocks to which they had clung for centuries and rose to the surface in triumphant protest.

And then, carried slowly by the river current it moved majestically downstream, like an advancing army, toward the dam. But it battered against the walls of the fortress in vain. Gradually it was rent and broken asunder by the force of the river and passed over the spillway in disintegrated helplessness. Its timbers, passing on down the Abitibi, into the Moose and then into James and Hudson Bays, have now joined the shapeless mass of derelict that forever strews the shores of our northern seas.

Rose to the surface in triumphant protest



Moved majestically down the stream,



But battered against the dam in vain



Island Falls, Saskatchewan

Why Canada has two Island Falls hydroelectric stations on entirely different rivers, we're not informed, but such is the case. "Flin Flon, The Story of Its Finding and Position Today" Miniota Herald, March 1, 1938, by Pratt Kuhn, speaks of the facility built between 1928 and 1930 on the Churchill River in Saskatchewan.

I must tell you of the floating islands that sometimes appear. One came down in the summer of 1932 that was a quarter acre in area and ten feet thick with trees on it six inches in diameter.

Of course, the double booms in front of the intake gates stopped it, but it took some maneuvering to move it to the spillway section by man power. Two traveling cranes took out stop logs and fed it through the openings of the dam.

The Churchill River is remarkably clean in this section though, considering the bush territory throughout which it flows. However, I got a photo of the floating island from a resident and here it is as a natural curiosity.



The floating island approaching boom in front of Island Falls power house dam



Floating island being pulled in-shore to be broken up and shot over the dam outlet outside the danger point to the power plant.

A close-up of the floating island. Many feet thick and with trees eight inches in diameter. It rests against the boom at Island Falls before being broken up and washed down.





Island Falls
hydroelectric
station today

Journal of Marvin Huffaker, Assistant Superintendent of the Churchill River Power Company, Island Falls, 1930 to 1944,

Churchill River and the consequences of building a dam at Island Falls.

Raising the elevation of the river here caused the river to back up about 30 miles upstream which caused muskeg bogs to float and in some cases large pieces as islands to break away and float downstream. Some of these would be two to three feet thick and up to fifty to one hundred feet in dimensions with growing trees on up to 6" in diameter.

I think it was in 1938 when there was still an occasional island coming down the river that broke away upstream, caused by high water and perhaps wind from its original location. This time Rees Davis and I and a Cree were in our inboard engine boat on the forebay and after tying ropes on the trees on the island and the Crees taking the other ends of the ropes to the north shore to help influence the island in that direction Rees steered the boat to the dam where I stood ready on the front of the boat to grab the dam handrail and pull myself onto the dam. Then I planned on removing the stop logs and open the spillway and have the water take the island thru the dam and down the river.

I walked across the south end of the dam, thru the gate house to the north end of the dam and opened the spillway in time to get the island floating thru the dam with a rush. The trees on the island hit the top of the concrete dam and broke like matchsticks as they went thru with the current and sounded like shot gun shells bursting. The tailrace became red or brown with the muskeg which made up perhaps 50% of the island, for a minute or two as the island broke up and went downstream.

Ten years later, "Floating Island, Four Acres Appear in Churchill River," Lethbridge Herald, October 14, 1948,

Anybody lost four acres of land?

If so, they should apply to B.W. Davis, superintendent of the Churchill River Power Company at Island Falls, Sask.

He's impounded four acres for trespassing in the Churchill River.

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The wandering tract of land, complete with spruce trees and other vegetation, suddenly appeared above the Churchill River dam, extending 500 feet upstream and greatly altering the known scenery with its moving panorama of towering trees.

It was not the first floating island to drift along with the river's current, but Mr. Davis said it was by far the largest.

It bobbed around above the tumbling spillway at the dam, while the suction of the water tore and churned at the muskeg mattress which formed its foundation.

Workers prodded and pulled at chunks of the island until it was reduced to small enough pieces to go down the spillway and ultimately be deposited in one of the countless lakes below the dam.

Damming the river is reported to have caused a rise of 15 feet in the water level, with sufficient pull being exerted on buoyant muskeg to detach considerable portions from the shoreline.

Barrier Lake, Saskatchewan

Empty Hands (1924), by Arthur Stringer, fiction, but a good description,

She realized, when she came to small tussocks islanded by mucky-bottomed pools that she was in the midst of a northern muskeg... She pushed on, seeking for a footing along the soggy tundra which grew spongier and spongier under her guarded steps. Instead of walking, she was finally compelled to leap from hummock to hummock of wire-grass, to veer from sustaining willow-clump to willow-clump, stepping over open water which bubbled with marsh-gas at the weight of her body.

She stooped over one of these black-bottomed pools and tested it with her spear-handle. The wooden shaft, she found, sank into the ooze as far as she could reach with it, sank into it with no promise of coming into contact with anything solid. This filled her with a momentary small horror that sharpened her eagerness for solid ground under her feet. She knew, as she started forward again, that she could get none too soon out of that floating and bubbling quagmire which was more treacherous than open and honest waterways.

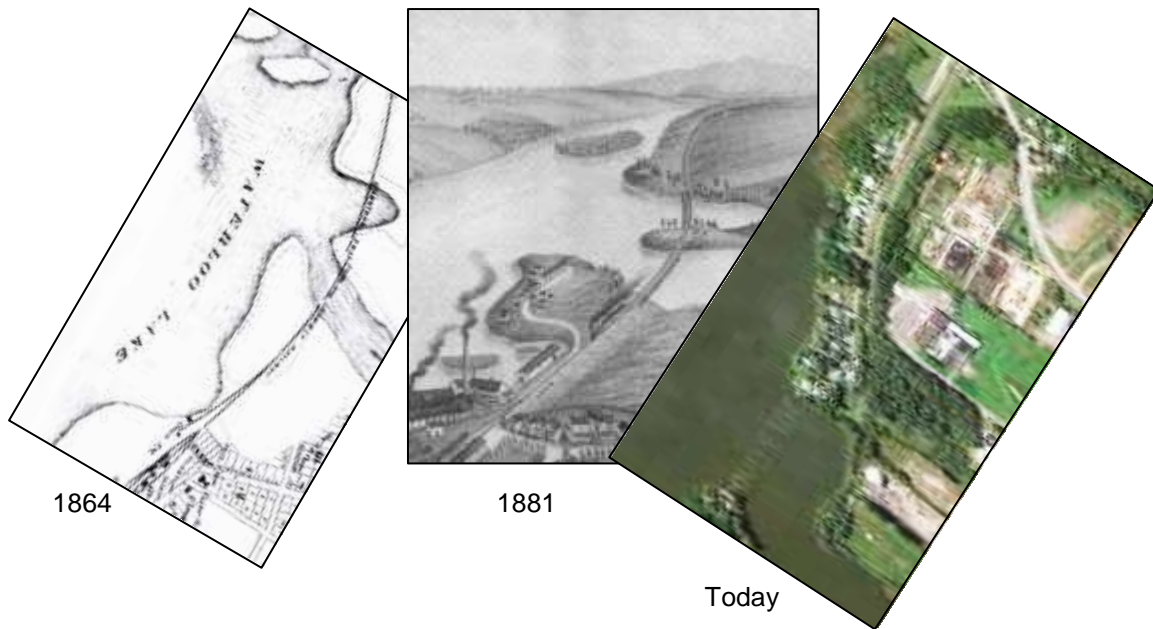
Her advance even took on a touch of the frantic, her close-bound hamper pounding on her shoulders as she leaped and dodged from sedge-tuft to sedge-tuft. With another hundred feet, she could see, she would be safely on wooded ground. But she was less deliberate, by this time, in her choice of stepping-spots. She landed on a larger island of turf which subsided slowly under her weight, as a raft might. She could feel it go down, sickeningly, as she ran across it. And as it went she leaped from it to a smaller hummock which seemed to dissolve like a melting chocolate mousse under the impact of her feet.

She went floundering down through it, knee-deep in the ooze which blackened with her struggles as she fought to release herself. That ooze received her and held her in its velvety softness, drawing her deeper inch by inch as she fought to free herself from it. Inch by inch, she continued to sink. She went down until she was thigh-deep, waist-deep, in a batter that sucked at her as greedily as quicksand might have done.

Her eye fell on the end of her spear-shaft, which she had dropped in the struggle. That, too, was slowly going below the surface. So she withdrew it from the sucking batter. Reaching out with it, she was able to pole closer to her body the floating island of turf through which her feet had first broken. Across this she placed her arms. But when she attempted to impose her weight on it the sodden mass invariably sank. It supported her shoulders, however, so that she could lean forward without being sucked entirely under the surface. And when she held the end of her spear-shaft in her outstretched right hand she found that she could just reach a clump-willow on a soil-knoll ten feet in front of her.

Waterloo, Quebec

While the 1881 drawing below suggests an island floating down a channel, the formation was much the same 17 years before in what's today, a largely-sedimented cove of Lake Waterloo.



The 1881 "floating island" later broke into several parts, the largest being 200 x 75 feet with trees said to be up to 50 feet high. The greater island was last seen in 1915, when it drifted to the middle of the lake. Small break-away masses remained mobile into the 1960s.

Challenges remain, as noted in sales literature from Canadianpond.ca.

At a fishing convention last year my husband was speaking with an "old-timer" about these new floating islands. In the 1950s when he was young and foolish, this man remembered blowing up several natural floating islands on Lac Waterloo in Quebec because, as he recalled, "they freaked us out."

LaSalle, Ontario

Medicine Hat News, July 8, 1952,

This bit of marshy real estate, looking like a pile of bull-rushes (which it is), is an unwelcome visitor to LaSalle, 10 miles east of Windsor, Ont. It's a floating island, measuring 50 by 30 feet and is big enough to support a cottage. It dropped anchor at LaSalle and residents say it is one parcel of real estate, they would like to dispose of in a hurry.



Wisconsin

Milwaukee Sentinel, December 10, 1893,

Most curious perhaps of all the islands is Milwaukee's floating island. This migrating piece of real estate embraces several acres in extent, but owing to its boggy character and frequent change of location is not likely to be platted by even the wildest real estate boomer. It drifts hither and thither with every change of wind, and sometimes annoys the cottagers by displaying unwarranted familiarizations.

One time last summer, the city campers who are wont to come to Milwaukee every morning waited in vain for the excursion steamers that ordinarily convey them to the depot. Later they learned that during the night the floating island had drifted to the head of the lake and imprisoned the steamers as surly as if the lake had been drained. The only alternative seemed to be to wait till the island shifted its position or to cut channels through it.

Life, July 25, 1938,

These pictures were taken of a piece of land that floated three miles across Lac Vieux Desert in Wisconsin.

The first picture was taken when I first discovered same. It landed at the summer estate of the Carroll brothers of Chicago.

It is almost half an acre, has 20 tamarack trees on it and is now an ideal rock bass fishing ground.



The floating island boathouse is visible far out in Lake Vieux Desert

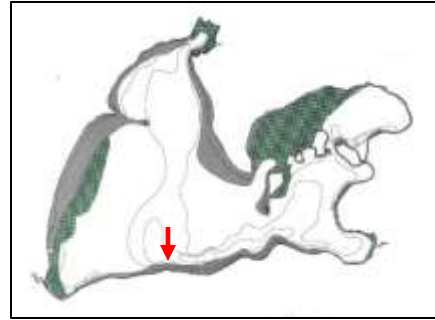


Buoyed by tamarack roots, it drifts closer to the shoreline



The half-acre island comes to rest off the Carroll boathouse.

Green tinted areas indicate fibrous peat on Lac Vieux Desert lakebed. Boathouse indicated by the arrow.



Below, floating islands with *Carex filiformis* in the foreground, Big Bay Lake, Madeline Island, Wisconsin, Library of Congress American Environmental Photographs, 1891-1936



Big Bay Lake today

Minnesota

"Island Floats in Mid-Lake," Virginia Enterprise, July 24, 1914, regarding Chisholm, Minnesota,

The acre patch of dense vegetation which has acquired much local fame during the past week, as Longyear Lake's new floating island, after drifting for five days about the lake, has been driven by a brisk wind into almost the identical spot from which it was dislodged by the unusually high water a week ago.

The island has several trees and bushes growing upon it, and is sufficiently dense to support a man, as was evidenced when one of a boating party clambered upon it, while it was floating in shallow water at the eastern side of the lake, its slow westerly course along the interurban bridge occasioned much astonishment among passengers who had never seen an island in that vicinity before.

Chapter 23 -- Mind the Muskeg

We'll end with a pair of references regarding Native Americans, first from "Medicine Songs of George Farmer," American Anthropologist 24, 1922, by Albert Reagan, an anthropologic study of the the Bois Fort band of the Chippewa Tribe.

Na-na-mi-ga-mig is the "muskeg" (peat) in the swamps rising up out of the water, a sort of floating peat, the Indians believing that the land surface of the earth is a floating muskeg -- "lots of islands on the surface of the big ocean."

They base their belief on the fact that a piece of muskeg will tear loose from the bottom of the shallow lakes in that northern country and float around bearing upon it quite a bit of vegetation, even small trees. I have used such floating islands as concealments in the fall when hunting ducks on Nett Lake... but I had to be careful lest my island sink under my weight and leave me in the water.

Traditional Ojibwa Religion and Its Historical Changes (1983), by Christopher Vecsey,

The Ojibwas viewed their worlds as a float place or earth, like a muskeg floating in a lake. Below the water was another flat earth, above was the dome of the sky on which a third world was located.

Conclusion

As the term "muskeg" is regional -- as opposed to denoting a particular biological classification -- we could augment our survey by raiding other chapters for Canadian or northern US sites. But as North America has sufficient peat flotations for any number of lists, we we'll leave the other chapters as they are.

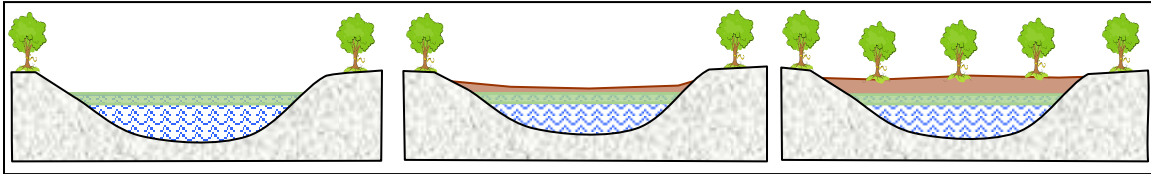
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CHAPTER 24

CHECK THE CRUST

It's what a baker would advise if our floating island were the surface of an incrustated lake.

Lake incrustation is the process in which a water surface is progressively matted with biomass, which in turn accumulates earth, which in turn grows to resemble the terrestrial terrain.



As indicated in the prolog, our study of floating islands is sequel to Underground Rivers, From the River Styx to the Rio Buenaventura with Occasional Diversions. As to which volume best suits a particular water-under-earth subtopic can be an interpretative determination. Is an instance terrain over unseen, quiescent water more about the floating surface or more about the underlying fluid? The fully-encrusted surface is no longer an island, but what's beneath is not likely a flowing river -- it's probably a muck. The Underground Rivers chapter "Railroads and Incrusted Lakes" thus has much in common with the chapter before us..

Jahrbücher der Preussischen Monarchie (1799) mentions a subterranean lake near Rhaude in West Friesland, a report repeated by A. Barrington in A Treatise On Physical Geography (1851),

West Friesland has a subterraneous lake which appears to have been covered with floating islands that gradually united together, and ended in forming a solid crust.

As for the practical issues of land suspended upon water, we've the authority of those forced to surmount the obstacle, the railroaders.

"Subterranean Lake," Scientific American, April 29, 1848,

The [Ohio] Mud River Railroad was originally laid out and graded across this prairie, but the workmen one morning discovered that a portion of the track had disappeared; large timbers were laid across the "hole," and the superstructure again completed, when about six hundred feet of the road dropped down.

Across this prairie runs a small stream -- the soil is rich, consisting of decayed vegetable matter, some six or eight feet in depth, which is evidently crust over a small lake; the water under this crust is thirty feet deep and fine fish are found in theses subterranean waters.

"Subterranean Lake Recovered," Scientific American, November 18, 1848,

On the Michigan Railway it became necessary to carry a grading or embankment of fifteen feet high across a low piece of ground, containing about 100 acres, nearly dry enough for plowland. When they had progressed with the grading for some distance, it became too heavy for the soil to support, the crust of the earth broke in, and the embankment sunk down into seventy nine feet of water! It appears that the piece of ground had been a lake, but had collected a soil of roots, peat, muck, &c., on its surface, apparently from ten to fifteen feet thick, which had become hardened and dry enough for farm purposes.

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"The Subterranean Lake on the Central Railroad, Michigan," Scientific American, December 30, 1848,

It appears that the piece of ground over which the grading was to be made had once been a lake, but was not covered by a soil of roots, muck, &c. to the thickness of from ten to twelve feet.

"Growing over of Lakes," Michigan Farmer, January 1, 1849,

There is a small Lake, called Bear Lake, between here and Marshall, which is not far from half a mile across, and which is rapidly growing over. Mr. P. remarked, that during the seventeen years he had been in the country, more than one half of its entire surface had grown over, by means of the gradual accumulation of leaves and other decaying vegetable remains, which floated upon its surface, thus forming a productive marsh.

This reminds us of the discovery of an underground lake by the Central Railroad Company, to their cost. A few miles West of Niles, they came to a marsh which needed to be raised to a grade of twenty feet. It is some seventy rods across it in the narrowest place, and here they commenced their grading, but they had not extended it more than forty feet from the bank, when the entire mass of earth, twenty feet in depth, which had been hauled upon the marsh, sank down and disappeared. Upon examination it was found, that the marsh, consisting of common muck, of some ten or twelve feet thickness, rested upon a lake, whose greatest depth is about eighty feet, and whose waters are clear as crystal.

"A Subterranean Lake Beneath a Missouri Town," New York Times, August 18, 1871,

The roof of the lake, composed of red clay and flint gravel, had fallen until only a thin crust remained. This was broken through by the hoof or a horse or cow, and the vapor arising one frosty morning attracted the attention of a colored man who reported it.

"Rails in Unstable Spots, Building over Morasses and Underground Lakes, Instances where Portions of Roads Have Disappeared from Sight," New York Times, September 5, 1871,

Last fall one of these phenomena occurred near Basket Station, on the Erie Railway, in Sullivan County. About three acres of land, heavily timbered with hemlock occupying an elevated position, suddenly sank below the surface. The tops of the highest trees in the tract could not be seen above the banks. The sinking was not accompanied by a crash, as in a landslide, but the land appeared to sink gradually and easily. The trees stood, and are still standing in their natural positions, as if nothing had occurred. In close proximity to the scene of this phenomenon there is a lake, which no doubt was once much larger, and over which this plot of ground had formed, as in the other cause.

Near a point on the line of the New-Jersey Midland Railroad, known as Port Tuttle, the workmen were greatly surprised one morning a week or two since, to find that several rods of grading that they had left overnight had entirely disappeared, and water and loose mud of unknown depth was all that could be seen... The general appearance of the surrounding country would seem to indicate that there is here an underground lake, which was once a natural sheet of water coveting a large area of country which is now a swamp. By the filling in for ages of earth and rocks from the hillsides, and the growth of vegetation, a crust has been formed over it, which has eventually closed the lake, and its surface is now entirely overgrown... A team passing over its surface will shake it for yards around, which gives strength to the surmise that it is floating ground.

New York Times, June 12, 1880,

In 1870, when the Monticello and Port Jervis Railroad was being graded near Gilman's, it was noticed that the ground for several rods was moist and "shaky." It required much filling to make a solid road-bed. A year afterward, the road having been in operation several months, the watchman of that section of the track was walking along the railroad just after the passenger train to Monticello had passed the spot. Suddenly he saw the railroad embankment gradually

sinking for a long distance ahead of him. He ran to a high bank at the side of the road just as the railroad dropped, with a loud noise, 15 feet below the surface.

The phenomena of the incrustation of sheets of water, which, in the lapse of time, became solid earth apparently forms an interesting subject for scientific investigation. The process of this incrustation may be witnessed at Amber Lake, in the Town of Bethel, Sullivan County. A large of the shores of that delightful little sheet of water is a floating morass, which, near the water's edge, is too thin to sustain the weight of a grown person, but seems firm and solid as the shore is approached.

Locomotive Engineers Journal, July 1892,

Another curious instance of this kind occurred in 1872 on the Whitehall and Plattsburgh Railroad, near Crown Point... The earth on all sides opened in fissures from four to eight feet wide and 50 feet deep, and the level surface of the ground for 400 feet around was changed into an area of rounded hummocks and cup-shaped hollows.

"A Wonderful Lake: A Small Lake Filled With Floating Islands," Indiana Progress, September 25, 1889, describes the dozen or more floating islands in Pennsylvania's Cajah Pond, a.k.a. Cajaw or Cadjaw Pond, Note the closing prediction.

A lake a mile from Honesdale... is filled with floating islands. This lake is known locally as Cajah Pond. It is dotted with a dozen or more islands. These are covered with trees, some of them twenty feet high, and a dense growth of thick-foliaged bushes.

If the wind happens to be strong and variable, as it generally is on the lake, the visitor who looks upon the lake for the first time can hardly help being startled to see these islands moving about from the point of the compass to another as the wind shifts. On one day these islands may be seen huddled together in one spot, and on another day, perhaps, they will be seen scattered widely apart.

One day while three pickerel fishermen were fishing from the island's outer edge it suddenly was seized with a whim induced or prompted only by a gentle wind and before the fishermen knew it they found themselves fifty feet from shore. The island floated slowly across the lake until it had almost reached that shore, when a counter breeze struck it and sent it down the lake. It finally landed near the spot where it started from a year ago, and it has remained in that vicinity ever since, simply taking a short trip now and then to and fro across the lake, but always returning to or near its old moorings.

There are six or eight of them, and the scientific theory is that in time the roots of the trees that cover them will extend down into the water so far that they will anchor the islands in the lake, and that by the slow but sure progresses of nature they will be increased in size until the surface of then lake will become solid again.

"Built Over a Flood, Philadelphia Someday May Tumble Into Underground Lake" Mount Vernon Daily Argus, October 17, 1913,

Engineers in charge of the excavations for the foundations of the addition to the Ritz-Carlton hotel, at Broad and Walnut streets, asserted that central Philadelphia, with its skyscrapers, is resting on a floating island and may at any moment be engulfed in quicksand.

Forty-five feet below the street level workmen poked their picks through the shell-like covering of an underground lake, the waters of which rise and fall with the movements of the tide. The engineers assert that far underground this "lost water" is ebbing and flowing, just as at the open seashore.

Mineral Incrustation

Apart from bio-induced incrustation are mineral incrustations of geothermal origin, examples readily seen in Yellowstone National Park. The film tends to be brittle, rather than deformational



From The Discovery of Yellowstone Park (1905), by Nathaniel Langford, the first Superintendent of Yellowstone National Park,

Around them all [the hot springs] is an incrustation formed from the bases of the spring deposits, arsenic, alum, sulphur, etc. This incrustation is sufficiently strong in many places to bear the weight of a man, but more frequently it gave way.

And back to the railroads. "A Study of Harriman, Master of Railroads, and his Methods of Work," New York Times, August 1, 1909,

The best illustration of Mr. Harriman's constructive gift is not so much the plan of the Lucin cut off, involving the construction of a viaduct across the Great Salt Lake, as the fact that Mr. Harriman ventured where other railroad managers had only sighed and hoped. He dared to sink millions in the then unmeasured abyss of that salt sea, never wavering, not believing that he was throwing good money after bad, fighting constantly against nature, until at last, having sunk some thirty million in those incrustated waters, he conquered nature, stretched his viaduct across the sea, and was able to reckon that the saving in time and cost far more than met the interest upon the cost of this investment.

Mr. Harriman is, of course, the monopolist of Chapter 33.

Bermuda

For what it's worth, Sketches of Bermuda (1835), by Lloyd Susette

Sailors have a notion that the Bermudas are floating islands, encrusted with so slight a covering that there would be but little difficulty in breaking it.

CHAPTER 25

CHECK IF IT'S AN ISLAND FLOATING ON AN ISLAND

We've no exogetic theory for our observation, but islands seem to breed islands. Chapters 2 and 33 describe islands floating upon the British Isles and Chapter 62 does the same for Australia. Chapter 25 includes the floating fishing islands of Madagascar and the Philippines.

We'll add to the list.

Indonesia

"Verschlag van een onderzoek naar het outsaan van een eilangje," Natuurk. Tijdschr. v. Ned. Indie 45 (1886), by A. Stoop, notes the formation of a floating peat island the Rawa Pening. The modern Lake Rawa Pening, created by construction of a barrage in 1916, provides central Java with power, irrigation, flood control and fish. Floating mats composed of water hyacinth, grasses, sedges and rice paddies cover up to 60 percent of the water surface.



A 1989 survey revealed,

A 50-percent decrease in species on the islands in one decade due to the grass cutting and peat soil removal,

Increased water loss and siltation, and

Decreased fish population.

The water uptake of aquatic plants may cause Lake Rawa Pening to dry out by the 2020s.



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Japan

Ohnuma National Park in Hokkaido encompasses lakes Ohnuma and Konuma, created when mudflows due to Hokkaido Koma-ga-take eruptions dammed the depressions at the base of the mountain. The ponds are dotted with *Brasenia*, a perennial aquatic plant with floating peltate leaves and rhizomatous stems.

By one count, Lake Konuma has 127 bio-mass islands floating on its surface,



Lake Ohnuma. 600 meters long, 150 to 350 wide, and 3 meters deep, has high banks and small bays covered with thick vegetation. Shinto priest En-no-Shokaku discovered the floating islands of Lake Ohnuma in 681. Ohye Hiromoto, Lord of Sagaye, built the Uki-shima ("Floating-Island") shrine in 1193.

Ohnuma's islands consist of sod and decomposing plants. While the largest is 10 by 2 meters, the majority are only a meter or two in dimension, covered by reeds in turtle shapes. Early photographs of the larger islets show luxuriant shrubs resembling mountains and trees.



The islets move, usually in the morning or toward evening on a sunny day. Difference in water temperature is said to provide the propulsion.

In Scenic Spot: The Floating Islands of Onuma (1927), Manabu Miyoshi notes 60 floating formations. Recent tourism publicity ups the claim to 300.

The 5000 square-meter peat island Uki-shima no mori ("Forest on Floating island") in the Shingu-Isawa wetlands, Wakayama, once rose and fell with the pond level, was moved by strong winds and swayed when trod upon. In the past decades, however, its surroundings have urbanized, groundwater has been depleted, and soil has eroded into the waterbody. The island is now partially stranded.

Shingu City has worked to revive the island by augmenting inflow from the Kumano River and reducing biological oxygen demand and turbidity.



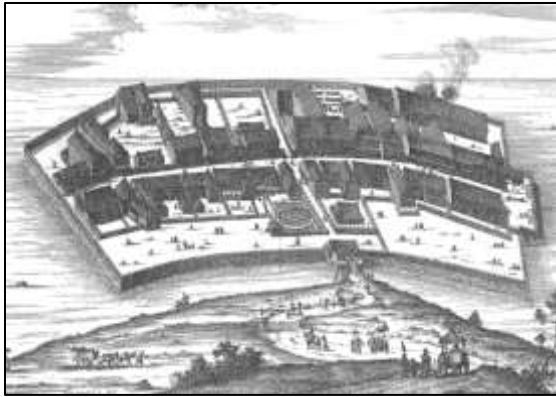
The Oze plateau, 1,400 to 1,700 meters above sea level, and straddling Fukushima, Gunma and Niigata prefectures, was created when lava from Mt. Hiuchi-ga-take dammed the Tadami-gawa

Chapter 25 -- Check if it's an Island Floating on an Island

River. About 400 shallow pools nourish such bog plants as mizubasho (Japanese skunk cabbage) and nikko-kisuge (yellow alpine lily).

Within Otowa Pond, Sado, is the largest floating island on Japan's high marshy wetlands. Over 200 species of vegetation grow luxuriantly round about it.

As the Japanese government opposed Christian missionary work because the Revolt of Shimabara-no-ran by Japanese converts in the 17th century, Dejima, literally "out island" or "exit island," was constructed by landfill in Nagasaki Harbor in 1634 to confine Portuguese traders. A few years after the completion of the island, the Dutch East India Company replaced the Portuguese.



1669



1852

David Mitchell's bestselling The Thousand Autumns of Jacob De Zoet (2010) has brought Dejima to more-recent attention.

A high-walled fan-shaped artificial island, some twelve-hundred paces along its outer curve... by eighty paces deep, and erected, much like Amsterdam, on sunken piles.

Reviews,

Dave Eggers, <u>New York Times</u> , July 1, 2010	<i>Because Edo-era Japan is closed to all foreigners, and no Japanese national is allowed to leave the island, this port is actually a detached and FLOATING CITY, anchored off the mainland near Nagasaki.</i>
James Wood, <u>New Yorker</u> , July 5, 2010	<i>It is 1799, the Japanese, enforcing their policy of isolation, confined the Dutch to their post at Dejima, a kind of FLOATING VILLAGE connected by a bridge to the mainland, and strictly monitored them.</i>
Matthew Flaming, Goodreads June 17, 2012	<i>With apparently effortless strokes he breathes life into the FLOATING ISLAND-settlement, and the cast of Dutch traders anchored there like a barnacle on the hull of worryingly foreign Japan, an impossible distance from their homes.</i>
Blair Mahoney, <u>Fancy Goods</u> , June 21, 2010	<i>Mitchell travels back in time, to the FLOATING ISLAND of Dejima in Nagasaki Bay in the years 1799 and 1800</i>
Marty Moss-Coane, <u>Radio Times</u> , July 13, 2010	<i>"The Thousand Autumns of Jacob De Zoet," immerses readers into a unique time and place: a tiny, manmade FLOATING ISLAND off the Nagasaki coast of Imperial Japan in 1799</i>

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<p>Ching-Chih Wang, <u>Dejima as an Imaginary Homeland: The Imagination of Gaijin in David Mitchell's <i>The Thousand Autumns of Jacob de Zoet</i></u> (2013)</p>	<p><i>When the Dutch Empire was transported to Nagasaki Harbor in the East, Jacob de Zoet could not but recall his memory of home on the FLOATING ISLAND and live up with the reality of being a displaced other who had to constantly confront with the "differently different cultural abnormality" in the floating world.</i></p>
<p>Jimee Choi, <u>Cultural Performance of the Margin: Alternative History and Politics of Identity Among Tsushima Islanders in Japan</u> (2008)</p>	<p><i>It was a FLOATING ISLAND on the waterfront of the Nagasake domain, about two-hundred and fifty yards square, linked to the mainland only through one small bridge which was under twenty-four hour surveillance by samurai officials. Merchants from the Dutch East India Company were literally locked up on this island along with a small number of their servants, interpreters and officials. They were never permitted to go outside Dejima.</i></p>


The plethora of "floating islands" in the reviews might suggest that Mitchell makes such an allusion for Dejima. The author does not; the novel's only "floating" metaphors being to a warship and an opera.

The captain imagines a floating city of British men-of-war and frigates.

"A well run ship," Captain Golding used to say, "is a floating opera."

Perhaps the reviewers' collective picture (and by no means an incorrect one) of 17th-century Japan as a xenophobic island floating beyond Western accessibility added words to their reading.

A few other references to Dejima,

<p>Itsuko Hasegawa, <u>Itsuko Hasegawa: Selected and Current Works</u> (1997), on the architecture of Yokohama's International Port Terminal</p>	<p><i>The floating tubular space, which spans from the city to the sea, is poetic machine that reminds us of exotic foreign lands and stories, such as Kew Gardens in England, Dejima (the FLOATING ISLAND near Nagasaki, Japan) and the Black Ships from America that came to Japan in 1853 opening the country to various influences.</i></p> 
<p>David Murphy-Shigematsu, <u>Transcultural Japan at the Borderlands of Race, Gender and Identity</u> (2007)</p>	<p><i>Today's Dejimas, cosmopolitan elites who live in special FLOATING ISLANDS of transnational communities, usually centrally situated around an international school.</i></p>

Dejima was incorporated into the shoreline in the 19th century. Today, Nagasaki is in the process of restoring historic Dejima, with plans to trench around the site and make the island "float" once more.

Papua New Guinea

Sisum anthelminticum at the margins of the Embi lakes forms a dense raft of horizontal stems extending 5 or 6 meters into open water, a platform for such species as Limnotherum indicum, the fern Thelypteris interrupta and a Cyperus species whose ramifying roots provide buoyancy.



Charles Lane-Pool's The Floating Islands of Lake Embi (1922-1925) describes the reverence accorded to the lake and of having visited one of the floating islands before the lake was drained by an earthquake, but it is questionable if the account is based on personal experiences.

Sirinumu Reservoir flooded both tropical forest and rubber plantation, with suddification among the flooded trees.



Lake Kutubu, Lake Tebera and the Nurank Swamp also have significant vegetative overgrowth.

The Philippines

"A Natural Wonder," Newtown Register, February 19, 1891, referring to Marinduque Island,

Over in a small pond just east of the road leading to Moriones, there is a peculiar formation of soil, or rather there is a bit of real estate which has a most uncommon habit of roaming about without a fixed habitation. It is really a floating island about an acre in extent, which goes from one side of the pond to the other according to its own sweet will. When the water in the lake is low the island gently subsides and rests on the bottom, but when the heavy rains come, and the lake is full, this eccentric kind of real estate calmly sails away to other scenes. Though the island is not of very solid matter, taken as a whole, there is yet soil enough upon it to support a pine tree 15 to 20 feet in height.

Off the shore of Marinduque, and thus not the above location, is yet reported to be a floating island accessible at low tide, suspiciously sounding like anchored seaweed.

The Gems of the East: Sixteen Thousand Miles of Research Travel among Wild and Tame Tribes of Enchanting Islands (1904), by Arnold Landor, reports on the Liguasan Marsh of Mindanao,

When you walk upon it you have to walk pretty lightly and be careful where you put your feet, or you go right through the island into the water below; but otherwise it is an enchanting place.

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Charles Brent, "A Strenuous Vacation," Outlook, June 3, 1905, mentions the same formation.

What are called floating islands clothe its black, malodorous bosom. They are so compact that the Moros who were employed to cut a passage through at times could walk on them, though it was a surprise neither to the Moros nor ourselves when they fell through. The natives are so near to being web-footed that they seem quite at home in the water.

Fiji

Lake Tagimaucia, a freshwater crater lagoon, is mostly covered by a peat-accumulating floating mat of sedge and algae.



Berthold Seemann, Viti: An Account of a Government Mission to the Vitian or Fijian Islands in the Years 1860-61 (1862),

After another hour's scramble we reached the summit, and found it to all appearance a large extinct crater filled with water, and on the north-eastern part covered with a vegetable mass,

This jelly-like mass is several feet thick, and entirely composed of some microscopic cryptogams,

A tall species of sedge was growing among them, and gave some degree of consistency to the singular body. We were not aware until it was too late that these strange productions were only floating on the top of the lake and forming a kind of crust, or else we should not have ventured upon it. On the contrary, we took it to be part of a swamp, that might safely be crossed, though not without difficulty, for we were always up to our knees, often to our hips in this jelly. All this caused a great deal of merriment.

The first symptoms of danger were several large fissures which occurred in the crust we were wading through. The water in them was perfectly clear, and a line of many yards let down reached no bottom. These fissures became more and more numerous as we advanced, until the vegetable mass abruptly terminated in a lake of limpid water full of eels. The border was rather more solid than the mass left behind, and all sat down to rest, from the great exertion it had required to drag ourselves for more than a mile and a half through one of the worst swamps I ever crossed.

Palau

A reed mat of *Hanguana malayana* along the shoreline covers 58 percent of Lake Ngardok. A section of mat has separated and floats freely.



Easter Island

The three volcanic crater lakes have extensive floating wetlands, 80 percent of the 100-hectare Rano Kui being covered by peat-accumulating mats of *Scirpus californicus* and the endemic moss *Campylopus turficola*.



Tasmania

Prior to 1964, Tasmania's Lagoon of Islands, a 9-square-kilometer wetland roughly 2 meters deep, was nearly covered by a mat of intertwined rhizomes of fine twigsedge and southern bristlesedge "whose interlacing rhizomes form a network firm enough to allow a man's cautious passage," according to Peter Tyler, Tasmanian Year Book 1976).

The mat was dotted with sedge hummocks colonized by herbaceous plants and eventually by woody shrubs. A few flotations even supported eucalypts, but the weight eventually caused a moat to surround them as they subsided.

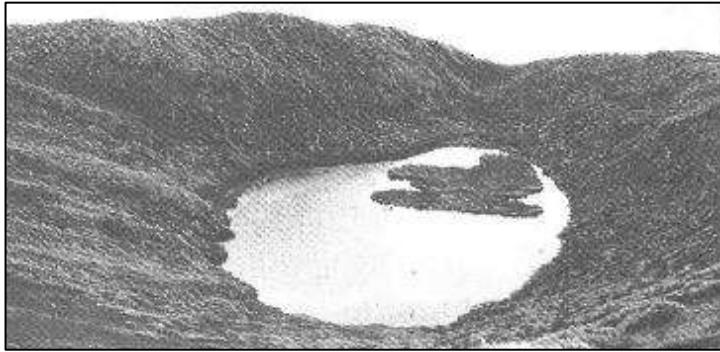
After the lake was dammed in 1964, the 2-meter increase in water level led to the decline of the mat, which by 1988 had fully disintegrated. Hypertrophic conditions followed, with a massive algal bloom from 1989 to 1992. Meanwhile *Triglochin procerum* (greater waterribbons), which had always been present, began to expand across the lagoon, and soon covered much of the area. Improvement in water quality after 1992 was short-lived and by the end of 1996, the lake was once more eutrophic.



Today, large clumps of black organic remnants of the algal bloom litter the beaches.

Macquarie Island, half-way between New Zealand and Antarctica.

Photos from "Subantarctic Macquarie Island," Environment and Biology (1990) by Patricia Selkirk, Rod Seppelt and David Selkirk,

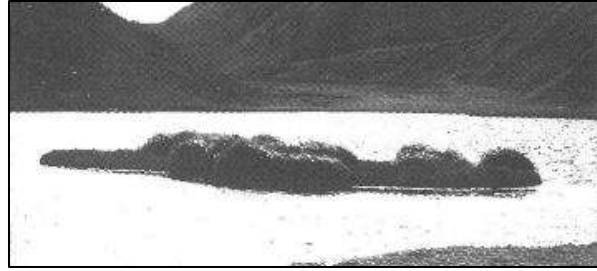


Lake with floating island near Mt. Elder, 1976



Arrow indicates from where island-forming vegetation may have slipped

Floating tussocks, Brother's Lake, 1980.



Iceland



Kattarauga Pond

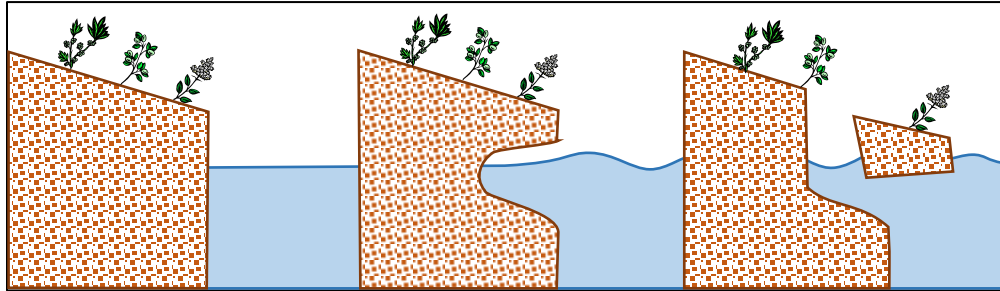
Conclusion

Our survey of islands floating upon islands has identified what are otherwise-unremarkable biological mats, but at least we got to many islands. It may be that insular observers are prone to see island forms -- fractal mapping, we might say -- while more-continental types might see little more than aquatic proliferation. In any case, there can be little doubt that a good place to look for a floating island is on an island itself.

CHAPTER 26 WASTE AWAY

Mass Wasting

Floating island can be created when flood waters rip assemblages of roots, soil and up-grown vegetation from river banks, in geologic terminology, "mass wasting."



Unlike biomass that originates upon water, vegetation on a mass-wasted floating island is of terrestrial origin and once torn free of that environment, is not likely to survive. The entire formation will likely soon disintegrate.

Wholesale mass wasting has long been observed from the banks of the Missouri and Mississippi. Francois-Rene Chateaubriand's Voyage en Amerique (1838) describes floating islands at the confluence of the two rivers.

The confluence of the Missouri and the Mississippi presents a sight perhaps still more extraordinary. The Missouri is an impetuous stream, with a white and muddy current, which precipitates itself with violence into the clear and tranquil Mississippi. In spring it detaches from its banks vast masses of earth: these floating islands are hurried down the Missouri, bearing along with them their trees, covered with leaves or flowers; some standing, others half fallen, they exhibit a wonderful spectacle.

Some scholars suggest, however, that Chateaubriand did not travel the Mississippi, but borrowed the passage from The Travels of William Bartram (1791), a description from Florida (Chapter 45).

Mrs. Monkland, in Life in India; or, The English at Calcutta (1828), describes a Ganges riverbank undermined by the monsoon, floating downstream with huts, a clump of trees, and natives upon it.

One night, a great alarm was spread by the falling in of a large mass of the precipitous bank near their mooring, which had been undermined by the action of the stream, and washed from its foundation. Fortunately it fell at some distance from the boats, which must otherwise have been swamped by its weight. It came crashing down with the noise of a cataract, shaking the bed of the river like an earthquake, and throwing up the water in the air, while the boats rocked about, and were in danger of getting foul of each other in the commotion.

They perceived that it was in motion actually coming towards them, and Julall at the pitch of his voice, shouted to the dandies of Captain Bently's boat, to inform their master of what had happened, while the rest of his brethren, screamed in concert, "O Sahib! Dukee bearer! Dukee bearer!"

The floating island still approached, borne along by the fury of the stream. The pressure of the water upon this side the river, a thing not uncommon, had separated the little promontory from the main land, and carried it away in the manner already described. Two or three native huts stood under the shelter of a clump of trees, whose long roots entwined together held the island afloat. A man of the gualier (cow-keeper's) caste, who had been on the bank when it became an island, no sooner perceived his danger, than with the usual indifference of natives to the fate of the rest, he snatched up two of his empty earthen pots, one under each arm, and jumped into the river with them, taking care to keep the mouths above water, by which means he sailed away very much at his ease without the fatigue of swimming, until he made a convenient landing place, a mode of travelling gualiers are often in the habit of adopting when following their cows.

"The Voyages and Discoveries of Father James Marquette, in the Valley of the Mississippi," by Jacques Marquette, in Discovery and Exploration of the Mississippi Valley (1852), John Shea, editor, likewise mentions such islands at the junction.

We heard the noise of a rapid into which we were about to fall. I have seen nothing more frightful; a mass of large trees, entire, with branches, real floating islands, came rushing from the mouth of the river Pekitanoui, so impetuously, that we could not, without great danger, expose ourselves to pass across. The agitation was so great that the water was all muddy and could not get clear.

"How a Hill Traveled," Marion Daily Star, September 4, 1882, describes a whole hill sliding into the Mississippi River at the rate of 10 feet every 24 hours, with occasionally pieces breaking free and floating down the river, standing trees and all.

Just below Saverton, Rail County, Missouri, is a very high, steep hill. Between the foot of this hill and the Mississippi river is a very narrow space -- only a few feet. Along this space runs the Long Line railroad track. One day recently some tremendous power tore the hill loose from the balance of the range, and the whole hill, comprising several acres of ground, began to move slowly into the river, pushing seventy-five yards of railroad ahead of it. This tore the track up for several hundred yards on each side. The whole earth seemed to tremble, and strange noises were heard in the bowels of the earth.

The spectacle is said to have been grand one, and hundreds of persons flocked to see it. The hill moved at the rate of ten feet every twenty-four hours. Occasionally a small piece would break off and float down the river with large trees standing erect on it, presenting the strange spectacle of a miniature floating island going down the river.

"It Beats the Sea Serpent. A Floating Island Story That Downs the Historic Reptile Yarn," New York Evening Telegram, June 14, 1892,

A strip of land nearly half a mile long and an eighth of a mile wide is said to be floating in the Pacific Ocean off the point of Cape Flattery. Captain George W. Torrey, of the fishing schooner Alice, which arrived at Seattle, Wash, a few days ago, reports that two weeks ago his vessel was almost run down by the floating island.

The captain and crew went on it and made a partial examination. There was a hut and a small farm on the island and other signs of habitation, although there were no signs of life.

"Farm Lost, Strayed or Stolen," Poseyville News, May 11, 1900,

The Bangkok Times announces that a large floating island on the Mekong or Cambodia River, in Siam, recently slipped its moorings, and has not been seen or heard of since. There were a number of trees three feet in diameter on the island, and the land was under cultivation. The owner has been hunting diligently for his property, but has not been able to hear any tidings of it. It undoubtedly went down the river with a freshet and has either stranded or gone to pieces.

"Currents Move Wandering Isle," Reno Evening Gazette, June 16, 1965, describes a floating island in Lake Mavrovo, Macedonia.

There's a wandering island in the lake which supplies a hydroelectric power station here in Macedonia. It was started by a landslide which fell into the lake, complete with grass and a few willow trees. Currents gradually moved it 12 kilometers across the lake to the shores of Ibis village. Farmers roped it to beech trees on the shore to keep it where it is.

We'll note more of the process in other chapters, e.g., the camalotes of South America (Chapter 28) and islands found floating in the high sea (Chapter 49).

Bog Bursts

A mountain-side landslide would not likely be called a "floating island," but a related form of mass wasting, a "bog burst," has at times been so labeled. An "ombrogenous" bog is a peat-forming vegetation community lying above the water table, and thus dependent on rain water. Should the water content approach saturation and mass has low cohesion to its substrate, the weight of liquid may cause the formation to "erupt," or more accurately put, to abruptly slide. To the observer, the "island" of land may seem to have "floated." Such eruptions can occur on relatively-gentle slopes after heavy antecedent rainfall.

On November 1771, the Solway Moss peat bog between the Cambrian rivers Sark and Esk suddenly and overwhelmingly erupted. As recounted in "Traveling Moss," Living Age, March 25, 1882,

Why it should have been so fast moored, age after age, and now have moved away from its native place like a floating island, nobody could tell, and, indeed, they had not time to cogitate that question.

Those who resided where the vast mass of eruptive matter broke forth, filled with consternation and dread, had to flee almost naked from their houses to find shelter and safety on higher ground from the desolating, foul, muddy flood, leaving furniture and cattle behind them -- a prey to the black and nauseous stream.

W. Gilpin, Observations on Several Parts of England, Particularly the Mountains and Lakes of Cumberland and Westmorland Relative Chiefly to Picturesque Beauty (1808) describes the fluid on which such a landmass "floats."

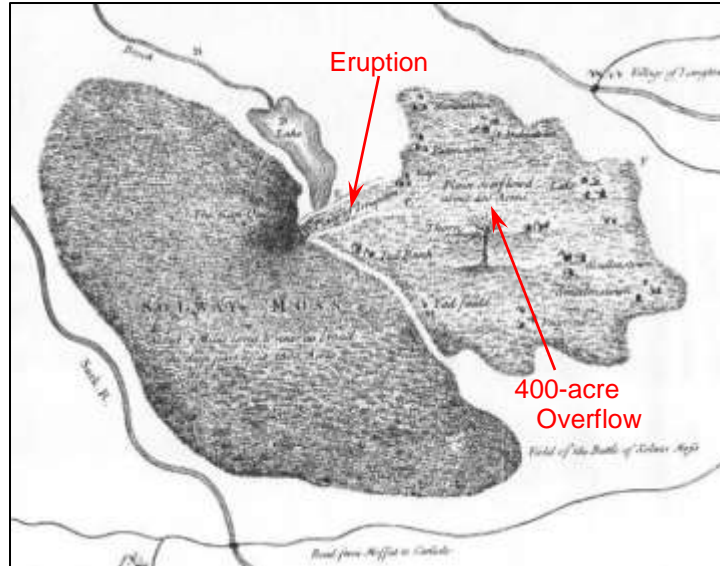
The substance of it is a gross liquid, composed of mud, and putrid fibers of heath, diluted by internal springs, which arise in every part. The surface is a dry crust, covered with moss, and rushes; offering a fair appearance over an unsound bottom - shaking under the least pressure.

From "Account of the Irruption of Solway Moss in December 16, 1772; In a Letter from Mr. John Walker, to the Earl of Bute, and Communicated by His Lordship to the Royal Society"

The Solway flow contains 1300 acres of very deep and tender moss, which, before this accident, were impassable, even in summer, to a foot passenger. It was mostly of the quag kind, which is a sort of moss covered at top with a turf of heath and coarse aquatic grasses, but so soft and watery below, that, if a pole is once thrust through the turf, it can easily be pushed, though perhaps 15 or 20 feet long, to the bottom.

If a person ventures on one of these quags, it bends in waves under his feet, and if the surface breaks, he is in danger of sinking to the bottom... The moss being quite over- charged with the flood, burst at these quags, about 11 o'clock at night, and finding a descent at hand, poured its contents through the gully into the plain.

About 400 acres of the flow, next the place of its evacuation, appear to have sunk from 5 to 25 feet, and this subsidence has occasioned great fissures upon those parts of the moss which refilled to sink. These fissures are from 4 to 8 feet wide, and as much in depth. The surface of the flow, consisting of heath and coarse grass, was torn away in large pieces which still lie upon the surface of the new moss, some of them from 20 to 50 feet long.



A massive block of Solway peat was initially transported 2 to 300 yards, while large numbers of smaller blocks were transported further. Portions of the eruption site were lowered 25 feet.

Having no picture of the 1771 event,, we've a photo from a bog burst in Shetland Islands, 2003.



"Solway Moss Described," Gentleman's Magazine, February 1779, describes spectator draw akin to that of the "Greatest Log Jam Ever" of Chapter 27.

People from all parts flocked to see this wonderful phenomenon, which continued moving slowly for several days.

CHAPTER 27

KNOCK ON WOOD

This chapter is about floating islands of wood.

For those content to settle with the bare-bones story, it's rather simple. From "Nature's Wonders," Utica Daily Press, December 20, 1939,

Mother Nature tries hard to cover ugly scars, and in the tropics this is accomplished very quickly. Fallen trees speedily turn to soil, aided by the action of plant roots. A floating log turns into a veritable flower box, and oftentimes it is the beginning of a floating island where birds may nest among the rank foliage.

For those wanting a story, there's "Mississippi River," Putnam's, May 1868, by Jas Noyes

But here is a floating trifle that will carry imagination as far into the dim future. Mark, from your seat on deck, that drift-log which the surging wave in the steamships wake has fastened into the mud of that almost floating island. Its gnarled and twisted trunk shows us how bravely and stubbornly it fought for life on some beetling crag of the Alleghany or Yellowstone. Its twisted and contorted roots even hold, in their firm embrace, a fragment of the rock upon which it grew a talisman that, myriads of years hence, may tell some wondering geologist the locality whence it came. Vegetable matter from these dank lagoons will accumulate around and bury the solitary trunk, with, perhaps, the skeleton of one of those fierce ganoid fishes, whose order is now well-nigh worn out in creation.

The floating island will in time become a trembling prairie -- a marsh -- a bed of peat -- a bed of lignite. Let ages after ages pass away, and the pressure of superincumbent strata will convert the lignite-bed into a layer of coal.

For those wishing to know the rest, we'll begin with natural islands, and then look at ones assembled by men. (They could be assembled by women, of course, but there's no record of them having done so).

Woody Debris

Charles Dickens, American Notes for General Circulation (1850), reflecting on the Mississippi River at Cincinnati.

If the coning up this river, slowly making head against the stream, be an irksome journey, the shooting down it with the turbid current is almost worse, for then the boat, proceeding at the rate of twelve or fifteen miles an hour, has to force its passage through a labyrinth of floating logs, which, in the dark, it is often impossible to see beforehand or avoid.

All that night, the bell was never silent for five minutes at a time; and after every ring the vessel reeled again, sometimes beneath a single blow, sometimes beneath a dozen dealt in quick succession, the lightest of which seemed more than enough to heat in her frail keel, as though it had been piecrust.

Looking down upon the filthy river after dark, it seemed to be alive with monsters, as these black masses rolled upon the surface, or came starting up again, head first, when the boat, in ploughing her way among a shoal of such obstructions, drove a few among them for the moment under water. Sometimes, the engine stopped during a long interval, then before her and behind, and gathering close about her on all sides, were so many of these ill-favored obstacles that she was fairly hemmed in the center of a floating island and was constrained to

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Chapter 27 -- Knock on Wood

pause until they parted somewhere, as dark clouds will do before the wind, and opened by degrees a channel out.

"Snakes of the Orinoco," New York Tribune, March 14, 1897, tells of a sighting in a South American river.

The low, flat island was abreast of us. It was floating down to the sea -- a real; floating island with vines and bushes in flower growing on it. It had also tracts of luxuriant grass, and around its edges, great masses of water lilies and lotus bloomed and flourished. High in the center of it was the prostrate trunk of an old tree which had flourished as a sapling, perhaps hundreds of years ago in some far-away valley near the Andes. Now it was a worm-eaten, spongy log, the backbone of a floating island, and on top of it, like an angel on some little spot of heaven afloat, a white egret stood, tall and stork-like.

Floating islands on Columbia's Rio Magdalena, "Voyage a la Nouvelle-Grenade," Le Tour du Monde 24 (1872) by Charles Saffray.



"A Few Odd Islands. Described by the Wayne County Man," New Ulm Review, May 3, 1899, comes from Pennsylvania.

Way back in the twenties the Delaware and Hudson Canal Company gouged a channel in the face of the earth from Rondout to Honesdale and called it a canal. For reservoirs and feeders to this canal the level of ponds and lakes along the route was raised by means of dams from 12 to 20 feet. While the dams were in process of building the timber about the ponds was felled up to the artificial water line, and in many cases really valuable lumber was left to decay where it fell. These dead trunks formed, when the water rose to its newer level, the basis of these floating islands, which may be found in so many of the lakes of Wayne county. Intertwining branches and twigs of the trees, themselves and large quantities of underbrush served to bind the logs together in something like a solid mass, thereby forming rafts of more or less buoyancy and size. In the course of time water weeds of various kinds attached themselves to the raft, and eventually became a part of it. Gradually a light, thin mold accumulated on the island, and in this mold birds planted seeds and grain, which, sprouting, growing and finally dying and rotting, did their part in the making of the whole. All of the larger islands bear from one to a score of trees, many of which have attained a considerable growth.

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As noted by A. Hyatt Verrill in Islands and their Mysteries (1920),

Where the vegetation grows luxuriantly throughout the year..., a floating island usually starts with a dead tree, a floating log, a mass of leaves, or grass or, in fact, any object which is floating on the surface of a lake or sluggish river. Upon this foundation seeds are dropped by birds, other seeds, drifting about, find lodgment upon it, and with the marvelous rapidity and virility of tropical plants they sprout and grow until, presently, the bit of flotsam is hidden by a little mass of greenery which constantly increases in size as grasses, brush, and vines are added to it.

If fortune favors, the little island continues to drift hither and thither at the will of wind and current, ever increasing and growing and eventually supporting a forest of good-sized trees whose interwoven roots form a stable and tough framework upon which the decaying fallen leaves build up a solid mass of vegetable mould.

Trees on a Floating Island, Showing how the roots spread above ground and bind the fallen leaves and dead trees together.



Mangrove trees, however, are far too heavy for floating islands. Verrill's photo comes from a saline swamp.

Floating logs and branches often enhance other formations. The Kapowsin Lake floating bog in Washington State formed over a mass of debris, penned behind a "flotilla" of timber. Sudd rafts have formed around drowned trees in Volta Lake, Ghana, and around the stumps of flooded rubber trees in Sirinumu Reservoir, Papua New Guinea. At Harvard Pond, Massachusetts, *Chamaedaphne calyculata* spread over the shallow lake from points of establishment on flooded tree stumps.

In terms of board-feet, however, nothing surpassed the Great Raft, a gigantic log-jam that clogged the Red and Atchafalaya Rivers, flooding an area equal to Georgia's Okefenokee Swamp.

The Great Raft probably began forming between 1100 and 1200 in heavy forest between what's now Shreveport and Paris, Texas. As the river meandered, green trees would fall from the caving banks. After a season or two of drying, the wood would be carried downstream by spring floods, losing most of the branches on the way and producing well-trimmed materials for the log jam downstream.

The raft was composed primarily of cottonwood logs and branches, but also of smaller amounts of oak, ash, willow, sweet gum, cedar bois d'arc. As the oldest materials tended to be located at the foot and the youngest at the head, the raft was not homogeneous, the upper portion, composed of floating islands, the lower portion of water-logged material extending to the river bottom and choked with sediment and detritus. Vines and small willows grew on the surface.

The raft grew more quickly at its upstream end than it decayed or washed out at the lower end, thus progressing upstream, sometimes at a mile per year.

The raft was not continuous, but rather with segments tending to form at river bends. The raft acted as a dam, flooding the alluvial overbank and further inviting additional debris to accumulate. When at last the decayed wood at the lower end began to slough off at the rate that new logs accumulated at the head, the wooden jumble extended 165 miles from Loggy Bayou to Carolina Bluffs.

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In 1806 Thomas Freeman and Peter Custis led 22 men in two flat-bottomed boats and a pirogue out of Fort Adams, Mississippi. Freeman's encounter with the Great Raft provides us an early description.

The first raft is not more than 40 yards through. It consists of the trunks of large trees, lying in all directions, and damming up the river for its whole width, from the bottom, to about three feet higher than the surface of the water. The wood lies so compact that...large bushes, weeds and grass cover the surface of the raft.

Next morning we came to the second raft, which crosses the river here 100 feet in width, and extends for 200 yards along its course... With great exertions we opened a passage for the boats, through this raft on one side, by floating the large trees down the river.

On the evening of the ninth [of June] we arrived at the third raft... This raft extends up the river nearly 300 yards.... With much difficulty a passage was effected through this; as the vacancy, occasioned by the removal of any part of the logs, was soon filled by others. The labor incident to the formation of a passage, through these small rafts, is so great, that the navigation of this part of the river is never attempted; for it would require to be repeated every time a passage was attempted.

The inundation area in the 1820s was described by Timothy Flint, as quoted in [A History of Navigation on Cypress Bayou and the Lakes](#) (2001) by Jacques Bagur.

There are places where the water can be seen in motion under the logs. In other places, the whole width of the river may be crossed on horseback, and boats only make their way, in passing these places, by following the inlet of a lake, and coasting it to its outlet, and thus finding the channel again. Weeds, flowering shrubs, and small willows have taken root upon the surface of this timber, and flourish above the waters. But in all these places the course of the river, its outline and its bends are distinctly marked by a margin of forest trees, which grow here on the banks in the same manner, as they do where the channel is open.

In the mid-1830s, steamboaters began systematically removing the blockade, a task that was continued until the latter part of the century. From "Raft of Red River," [Rochester Republican](#), September 5, 1837,

One of the most interesting enterprises which this age has witnessed in the way of internal improvement, is the removal of the raft which has for centuries been accumulating on the surface of Red River -- leaving the stream to flow beneath it for a space of nearly 150 miles.-- Capt. Shreve, one of the most skillful steam navigators of the Western waters, has been employed upon this important work -- and the task is now nearly accomplished... Capt. Shreve is well known in those parts as Uncle Sam's toothpuller:

The Great Raft is described as a chaotic mass of timber, confusedly heaped together, in some places trees of the largest size standing on or in it -- in others the body of the platform is 40 feet deep, the consolidation of ages, implanted in which are the roots of the trees of immense, magnitude that have shot up on this naturally-formed floating island.

Dead trees 6 feet in diameter are torn up by Capt. Shreve's steamboats from the beds where they had been reposing for ages, and sawed out into pieces as manageable as if they were walking sticks.

From [Principles of Geology, Or the Modern Changes of the Earth and Its Inhabitants](#) (1868) by Charles Lyell,

The Atchafalaya being in a direct line with the general direction of the Mississippi, catches a large portion of the timber annually brought down from the north ; and the drift trees collected in about thirty-eight years previous to 1816 formed a continuous raft, no less than ten miles in length, 220 yards wide, and eight feet deep. The whole rose and fell with the water, yet was covered with green bushes and trees, and its surface enlivened in the autumn by a variety of beautiful flowers. It went on increasing till about 1835, when some of the trees upon it had

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grown to the height of about sixty feet. Steps were then taken by the state of Louisiana to clear away the whole raft and open the navigation, which was effected, not without great labor, in the space of four years. The rafts on Red River are equally remarkable; in some parts of its course, cedar trees are heaped up by themselves, and in other places pines. There is also a raft on the Washita, the principal tributary of the Red River, which seriously interrupts the navigation, concealing the whole river for seventeen leagues. This natural bridge is described in 1804 as supporting all the plants then growing in the neighboring forest, not excepting large trees ; and so perfectly was the stream concealed by the superincumbent mass, that it might be crossed in some places without any knowledge of its existence.

From Wonders of Water (1872) by Gaston Tissandier,

During the last forty years this river has amassed such a quantity of floating debris in one spot, that an enormous island has been formed, 7 miles in length, 720 feet in breadth, and 8 feet in depth. In 1816 this mass sank and rose again with the level of the river, which circumstance did not at all retard the growth of vegetation, as the island was covered with a mantle of verdure. In the autumn it was gay with flowers. In 1835 the trees of the floating, island had attained a height of 60 feet, and the state of Louisiana ought to take measures for the destruction of this immense raft, presenting as it does an insurmountable obstacle to navigation.





"Agusan's Loggers: Hewers of Wood and Carriers of Water," Philippine Quarterly of Culture and Society 9:4, December 1981, by Peter Schreurs,

December 15, 1880. The Bay of Buruan is at this moment covered with floating trees and all kinds of flotsam uprooted by the inundations along the banks of the Agusan River. A big floating island of bamboos passes at a short distance from my banca.

Log Rafts

We deem constructed log rafts to be floating islands because

1. They tend to be bigger than many objects, natural or artificial, we think of as islands.
2. They're surrounded by water.
3. They're floating.

We'll begin with a European log raft, but otherwise confine our survey to North America. From "Timber Floats on the Rhine," A Journey Made in the Summer of 1794, Through Holland and the Western Frontier of Germany (1795), by Ann Radcliffe,

These are formed chiefly at Andernach, but consist of the fellings of almost every German forest, which, by streams, or short land carriage, can be brought to the Rhine. Having passed the rocks of Bingen and the rapids of St. Goar in small detachments, the several rafts are compacted at some town not higher than Andernach, into one immense body, of which an idea may be formed from this list of dimensions.

The length is from 700 to 1000 feet; the breadth from 50 to 90; the depth, when manned with the whole crew, usually seven feet. The trees in the principal rafts are not less than 70 feet long, of which ten compose a raft.

On this sort of floating island, five hundred laborers of different classes are employed, maintained and lodged, during the whole voyage; and a little street of deal huts is built upon it for their reception. The captain's dwelling and the kitchen are distinguished from the other apartments by being somewhat better built.

The first rafts, laid down in this structure, are called the foundation, and are always either of oak, or sir-trees, bound together at their tops, and strengthened with firs, fastened upon them crossways by iron spikes. When this foundation has been carefully compacted, the other rafts are laid upon it, the trees of each being bound together in the same manner, and each stratum fastened to that beneath it. The surface is rendered even; storehouses and other apartments are raised; and the whole is again strengthened by large masts of oak.

The consumption of provisions on board such a float is estimated for each voyage at fifteen or twenty thousand pounds of fresh meat, between forty and fifty thousand pounds of bread, ten or fifteen thousand pounds of cheese, one thousand or fifteen hundred pounds of butter, eight hundred or one thousand pounds of dried meat, and five or six hundred tons of beer.

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The apartments on the deck are, first, that of the pilot, which is near one of the magazines, and, opposite to it, that of the persons called masters of the float: another class, called masters of the valets, have also their apartment; near it is that of the valets, and then that of the sub-valets; after this are the cabins of the tyrolois, or last class of persons, employed in the float, of whom eighty or an hundred sleep upon straw in each, to the number of more than four hundred in all. There is, lastly, one large eating-room, in which the greater part of this crew dine at the same time.

On the morning of departure, every laborer takes his post, the rowers on their benches, the guides of the leading rafts on theirs, and each boat's crew in its own vessel. The eldest of the valet masters then makes the tour of the whole float, examines the laborers, passes them in review, and dismisses those, who are unfit. He afterwards addresses them in a short speech; recommends regularity and alertness; and repeats the terms of their engagement, that each shall have five crowns and a half, besides provisions, for the ordinary voyage; that, in case of delay by accident, they shall work three days, gratis; but that, after that time, each shall be paid at the rate of twelve creitzers, about four pence, per day.

Dort in Holland is the destination of all these floats, the sale of one of which occupies several months, and frequently produces 350,000 florins, or more than 30,000 l.

Different in quartermaster detail, but much the same in impression, from "Extensive Navigation." Mt. Morris Spectator, June 30, 1836.

During the last week, there has been coming down the Rhine, from Andernah, one of those immense rafts lately found descending this river with emigrants. It appeared like an immense floating island, 900 feet long and 200 wide, bearing a village on its bosom, and yet guided by one steers, man with as much security as an ordinary boat. The inhabitants of these rafts, that is the crew and passengers, amount to between 800 and 1000 persona. There are always cattle upon them, with slaughter houses for the supply of this numerous family, and there is generally consumed in the voyage from Andernach to Dordrecht, 50,000 pounds of bread, 20,000 lbs. of meat, 15,000 lbs. cheese, 1,500 lbs. of butter, and 700 tons of beer."

Regarding log rafts America, we've no better authority than Mark Twain's Life on the Mississippi (1883).

I remember the annual processions of mighty rafts that used to glide by Hannibal when I was a boy, ~ an acre or so of white, sweet-smelling boards in each raft, a crew of two dozen men or more, three or four wigwams scattered about the raft's vast level space for storm quarters -- and I remember the rude ways and the tremendous talk of their big crews, the ex-keelboatmen and their admiringly patterning successors; for we used to swim out a quarter or third of a mile and get on these rafts and have a ride.'

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Both of the above antebellum oils are by John Stobart. In "Moonlight Encounter on the Mississippi," after realizing that the safety-lantern on the flag-pole has gone out, a lantern-swinging raftsman rushes forward to avert collision with a paddlewheeler.

But we're ahead of ourselves

In the 1800s large rafts of logs and sawn lumber were floated down the Mississippi from the pine forests in Minnesota and Wisconsin. The earliest documented log raft to St. Louis was in 1839.

The first use of a steamboat for such purposes was in 1863 when a side wheeler of only 29 tons pushed a lumber raft at Read's Landing, Minnesota to Twain's hometown of Hannibal, Missouri.

Steamboat-pushed rafts required crew at the bow, manning steering-sweeps. To the right, a raft, 14 strings wide with forward sweeps, steamboat aft., en route from Read's Landing to St. Louis, 1869.



Gradually, however, these men were replaced by stern-wheel steamboats towing the load.

Between 1837 and 1901 more than 40 million board feet of logs were rafted down the Great River to sawmills. The largest log raft on the Mississippi was assembled at Lynxville in 1896, 270 feet wide and 1550 feet long, 2.25 million board feet of lumber.



On the Mississippi near Rock island, 1902



Rock Island, 1905

Different rivers called for different rafting methods.

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In 1843, rafts of on the St. Croix were managed with large oars and taken through lakes St. Croix and Pepin by means of sails or, in calm weather, by men along the shoreline pulling with hand lines.



Harper's Magazine, March, 1860

To raft the Chippewa River, strings were assembled, 16 feet wide and as much as 400 feet long, held together by transverse poles fastened with hickory or elm lockdowns, or plugs. Strings were similarly secured side by side.



Above: Rafts formed into three and four string widths, one fifth the size that could be managed down the Mississippi.

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To properly operate the "Wisconsin raft" required at least 10 bowsmen and 10 tailsmen together with a pilot and steersman. When required, all hands jumped into the water and with long heavy poles lifted the rafts off the sand bars. Crews continued to guide rafts until 1888



Preparing to run Dells Gorge of the Wisconsin River, 1886. .

A "Cumberland River Drift" was 280 by 80 feet, the largest that could pass the locks of that river. As many as three oars would be on the front, and two on the back. A shanty served to shelter the crew at night when the raft was not running. A mud and clay hearth in front of the shanty completed the vessel. The 220 mile trip from Celina to Nashville normally took five days.



The St Lawrence was a major conduit of timber. From The Traveler's Guide to the Hudson River, Saratoga Springs, Lake George, Falls of Niagara and Thousand Islands: Montreal, Quebec, and the Saguenay River (1864) by John Disturnell,

In addition to the more customary forms of steamboats, of ships, and other sea-going vessels, and of the craft usually employed in the navigation of large rivers, the waters of the St. Lawrence, more than any other even on this forest-covered continent, are frequented by enormous timber-rafts, commonly borne along on their way to market by the force of the current alone, though occasionally aided by spreading a sail, or by huge oars called sweeps. These floating islands of timber, with huts here and there rising from their low surface, for the accommodation of the raft-men, and another singular sort of craft with long, low hulls, nowhere else known, and designed chiefly for the transport of timber of great length, contribute the more remarkable and picturesque features to the animating spectacle presented by the navigation of this noble river; while, from its high latitude, and from the characteristic phenomena of northern skies, the ordinary, as well as the more grotesque, features referred to are accompanied by contrasts in the golden grandeur of the sunsets, and in the varied splendor of the northern lights, both of which are so frequent and so remarkable, that they may be very fairly regarded as habitual, and from which the scenery of the St. Lawrence derives a magnificence and beauty probably unequalled.

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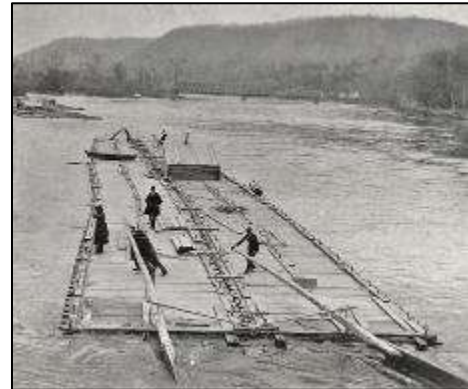
As recorded in "A Raft Adventure," The Albion, a Journal of News, Politics and Literature, August 18, 1864,

One of those huge rafts in which backwoods timber for exportation is conveyed down country, came in sight. It was floating slowly along on the almost imperceptible current, its single large sail giving just sufficient way to the floating island to allow the enormous tiller to guide it aright, while the smoke from the half-score shanties scattered over its surface, rising against the deep green forest, the ever-changing groups of figures, and the lines of washed clothes fluttering in the breeze, added to its picturesque aspect.

Faxon's Illustrated Handbook of Travel to Saratoga, Lakes George and Champlain, the Adirondacks, Niagara Falls, Montreal, Quebec, the Saguenay River, the White Mountains, Lakes Memphremagog and Winnipiseogee (1874), by Charles Faxon, offers another description.

The rafts of timber afford a highly-interesting feature on the river as the traveler passes along. On each a shed is built for the raftsmen, some of whom rig out their huge, unwieldy craft with gay streamers, which flutter from the tops of poles. Thus, when several of these rafts are grappled together, forming, as it were, a floating island of timber, half a mile wide and a mile long, the sight is extremely picturesque. And when the voices of these hardy sons of the forest and the stream join in some of their Canadian boat-songs, the wild music, borne by the breeze along the water, has a charming effect. Myriads of these rafts may be seen lying in the coves at Quebec, ready to be shipped to the different parts of the world.

The Allegheny River supported a like industry.



1885

By 1796, rafts were making the trip down the Susquehanna, some traveling as far as Norfolk, The industry escalated over the following decades until the river became a crowded highway of rafts. Between the 18th and 23rd of May in 1833, the year of the lower left etching, 3,480 rafts floated past Danville.



The challenges of rafting islands of logs across the sea proved more difficult.

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In 1791, James Tupper of Maine tree-nailed 1,000 tons of rough-hewn logs into the form a ship's hull, rigged it with masts, sails, and a lifeboat, and embarked for England. Unfortunately, the lifeboat was required off Newfoundland.

In 1825, Charles Wood from Quebec assembled, a 300- foot hull of squared timbers which he filled with logs and amazingly crossed the Atlantic. The second trip foundered..

In 1884, a 110-foot bundle of chained piling left Nova Scotia for Boston behind a steam tug. The North Atlantic made it a total loss. In a second attempt, the tug ran low on coal, cast off and headed for more fuel. Upon return, the crew failed to locate its charge, which turned up months later on the coast of Norway.

Edna Curry's "The Greatest Logjam Ever," American Forests 92.6, June 1986, chronicles when nearly 150 million feet of logs piled in the narrow gorge between the cliffs of the St. Croix River between Taylor's Falls, Minnesota, and St. Croix Falls, Wisconsin, on June 13, 1886.

The floating jumble stretched for two miles, and breaking it required six weeks of effort by 200 men. Tourists came by the thousands in trains and streamers to view the sight.



Quoting Curry,

That first week in June 1886, the lumbermen were a discouraged group. Everything depended on the weather, and this year the weather had been unusually dry. Instead of rising, the water was falling. Unless the lumbermen could float those logs down-river soon, they might well be stranded along the riverbank until the following spring. No logs at the sawmill would mean no pay for a winter's work, and many lumbermen would go bankrupt.

Then, suddenly, everything changed at once. News that the elements were cooperating at last with heavy rainstorms upriver spread like wildfire. Davidson, a hermit, blew up the Gam River darn with dynamite, freeing a glut of logs. Other small dams on other St. Croix tributaries-the Snake, Kettle, and Narnakagon were quickly opened. The men reacted with pent-up enthusiasm, and millions of feet of logs were shoved into the river in the fervent belief that the high water would carry them down river. A hundred different owners put their logs afloat at once, in a mighty panic to get them to the sawmills. Each log carried its owner's brand hammered into one end; the mighty jumble would be sorted out by brand in the "boom" or sorting pond at the sawmill downriver.

The "driving crew" was spread out over 10 to 15 miles of river, to keep the logs in the main current and moving smoothly. But the fast current and the huge number of logs all fed in so quickly were more than either the crew or the river could handle.

A "jam crew" was always sent ahead to known trouble spots at narrower rapids to watch for jams and try to break them up. One of these crews was in place in the Dalles at Taylors Falls, just below the falls was a trouble spot with a capital T. The river narrowed to a deep, sharp gorge between huge perpendicular cliffs of trap rock 50 to 100 feet high. Here, too, the St. Croix made almost a right-angle bend around the huge V-shaped cliff, appropriately named Angle Rock. Near it were the world's largest glacier holes, another legacy of the ancient glacier

that had formed the unique valley. Just below lay the 40-foot-high cross in the rock wall for which the river and valley were named, and the tall needle of rock called Devil's Chair.

Trouble began shortly after midnight on June 13. The jam crew was catching a few hours of sleep in tents along the banks when the crash of jamming logs awoke them.

It was also a news event, and coming at the height of the tourist season, it was a Godsend. Steamboats and the new railroad line from St. Paul, completed just six years before, would bring thousands of visitors. They would come to see the logjam, but would also see the beauty of the valley and the unusual rock formations, and they would come again or tell their friends. Jobs would be plentiful

Everyone who could spare the time gathered on the cliffs along the river, watching the busy lumberjacks. Some of them walked on tiptoe and spoke in whispers, as though any sound might loosen the jam even though all the efforts of the busy lumberjacks with dynamite could not.

Still the logs came on, released by the lumbermen upriver. It seemed that their fear of missing the drive and having their logs stranded was stronger than their fear of having them caught in the jam. Each day the position of the jam's rear was reported in the papers--now at Tuttle's falls, now a mile upriver. Finally, the jam was two miles long, in spite of tremendous efforts to break it.

Over the next several weeks the number of lumberjacks fighting the jam grew to 200. Dynamite was tried several times with little effect. Steamboats were sent. They tugged away at the head of the jam, assisted by engines and many horses on shore. Lines were strung across the river, and the engines and horses attempted to pull out key logs. Over \$100 worth of ropes was worn out every day, either by the hard pulls or by fraying on the sharp rocks.

At first the men worked at night as well as day, illuminating the Dalles with powerful electric lights and large reflectors. One reporter thought is a "fairly good representation of Sheol. The fantastic costumes of the men, who are shaking up the logs with long poles and grab-hooks in the weird blue light cast between the ragged, towering cliffs, the fires in the furnaces on the boats, noise of escaping steam, and clang of iron hooks and wheels, mingled with the demoniac yells of the men, combine to form a panoramic view wonderful to behold, and cause many to shudder for fear of the future."

But soon night work was given up as it was difficult to light the 1,000-foot wide river, and darkness increased the danger.

On July 8, a bomb of 24 pounds of dynamite was tried. At first it didn't go off, and everyone held their breath as

Bold Barney Corbett skipped out to the place, extracted the bomb, readjusted the fuse, and dropped the charge down under the logs near the front of the jam. A mass of logs went up in a sort of artificial water spout. (Stillwater Messenger)

For a time, the entire jam was in motion, winding like a serpent. Then it jammed again worse than before. But the jam had broken in two. Some felt it was a good thing, for the front part had been freed and millions of logs escaped, but most of the water had gone out as well, and that would make the rest of the logs more difficult to extricate. Luckily, the long dry spell had ended and it continued to rain, so more water would be coming downriver.

The last logs sluiced down the St. Croix were in 1912.

Things went better in the Pacific Northwest. "Ocean-Going Log Rafts," Scientific American 111:20, November 14, 1914, by J.F. Springer, describes the art.

Heavy timbers, each 12 by 20 inches in cross-section and 24 feet long, form the uprights of the floating cradle. The cross bar timbers are much lighter, being 6 by 12 inches in section. The

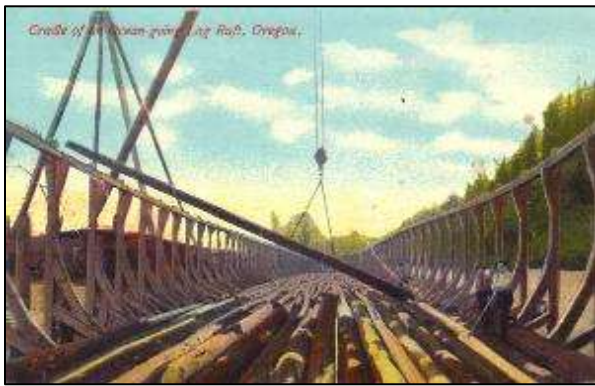
bottom of the cradle is constructed in sections that may be pulled apart when the logs have been secured together.

The logs are floated to the cradle and the raft built up from the bottom. When about half the logs are in place, an enormous chain made from 2-1/2-inch steel is laid along the axis. Seven herring-bone chains connect the center chain with the ends of the raft. The logs employed for the outer part of the raft are those which are the longest and most pliable.

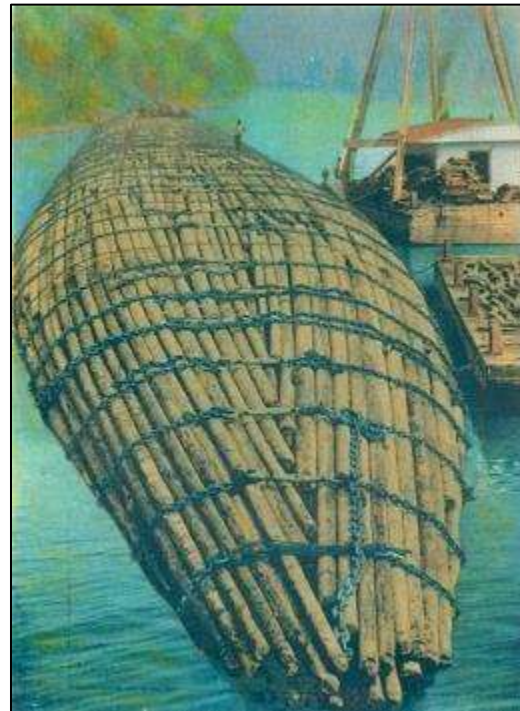
The outside logs will be 50 or 60 feet long, and the raft itself will have a length somewhere in the neighborhood of 700 feet.

The thickness of a typical raft is about 30 feet, and its breadth amidships, 55 feet or thereabouts. The tapered portions occupy each about 100 feet of the total length. The amount of timber contained in it will run from 4,000,000 to 5,000,000 board feet. It will sink into the water until about one third of its height is above.

A typical raft consisted of about 10,000 piling-sized logs laced with 175 tons of anchor chain. Virtually all hauls headed south, the major route being from the Columbia River to San Diego.



Crib construction, 1910



700 feet long, 56 wide, 24 deep.
8,000,000 board feet of timber.



Arrival in San Diego

The greatest raft of all time was assembled in 1907, 60 feet wide and 835 feet long, just 17 feet shorter than the Titanic. Its cargo of 11 million board feet provided enough lumber to build a thousand homes.

The "Davis raft" came into use in 1911, an awkward looking package, as large as 900 by 80 feet, but cheap to build. This square-nosed raft style is still used in inland waters.

The record of such rafts holding together during long tows was good enough that Lloyds of London would insure the risk for one-quarter of one percent of the raft's value. The better looking cigar-shaped affairs never received insurance for less than about ten percent.



The year 1918 saw two events yet to be explained -- rafts catching fire at sea.

Plans for transport to Chili and Shanghai never came to fruition.

The Great Depression put an end to dreams of expanding log-towing operations, and by late 1944, high seas rafting had ended. In the half century of the enterprise, the offshore rafts delivered more than a billion board feet of logs to the mills.

River rafting of logs continues to the present.



Oceanic timber rafts are also still with us, though most often of the unwanted variety

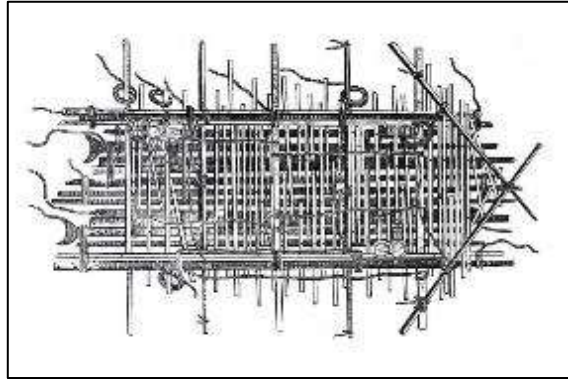
In 2009, a raft of timber, estimated to be 500 by 125 feet was created when the Russian ship Sinegorsk, en route to Egypt, started to list in force-10 gales 14 miles off the coast of East Sussex, and shed its 1,500-ton cargo of planks. The consignment washed up on the shoreline between Newhaven and Brighton.



Lake Las Vegas, Henderson, Nevada, 2010



The Medusa was a French 40-gun frigate, 20 meters in length and 7 meters in width, that took part in the Napoleonic wars. After the Bourbon Restoration, she was used to ferry French officials to Senegal for the handover of the colony. Through inept navigation of her politically-appointed command, the ship struck the Bank of Arguin. When the passengers and crew panicked, the captain decided to evacuate immediately, with 146 men and one woman boarding the woefully unstable raft built out of the wreck and towed by boats. When the towing got tough, the launches abandoned their charge and only a handful of the shipwrecked survived the ordeal.



"Raft of the Medusa" (1819), Theodore Gericault

CHAPTER 28 TANGO



We should learn to tango, as we may be aboard one of the innumerable islands drifting towards Buenos Aires.



Corrientes, Argentina is just below the confluence of the Rio Paraguay with the Parana.



"Floating Islands, Homeless Wanderers on Great South American Rivers," New York Tribune, August 27, 1905, on the Río de la Plata and the Paraná following the great floods of that year,


The Rio de la Plata and its tributary, the Parana, are now full of "camalotes" or floating islands, as a result of the great floods that have covered thousands of leagues of the land bordering on these rivers. What caused these floods no one seems accurately to know, as there has been no unusual rainfall in either Paraguay or Argentina, but the headwaters of the Parana are nearly two thousand miles from here, following the windings of the river, in the virgin forests of Brazil, and within a few miles of the sources of several of the tributaries of the Amazon, and reports kept coming out of this almost unexplored region in the autumn of the torrential rains that were falling there, and it is believed that these tributaries have been unable to carry off the vast volume of water that has fallen, and by their overflowing have caused the water that naturally would flow north to take a southern route and ultimately reach the Atlantic Ocean at Montevideo, nearly five thousand miles away from the mouth of the Amazon.

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Aided by the wind and current, these floating islands frequently cover considerable distances in the course of a day, but it is rare that they cover the thousand miles between Asuncion and Buenos Ayres, either being broken up in the rapids or grounding on the shallows somewhere along the route.

For the first time in thirty years, however the recent great floods have brought them down in thousands, and the stoppages on the way have only added to their size, until their very mass by backing up the water behind, forced them over the obstructions, and for the past week that Rio de la Plata, which is thirty miles wide opposite Buenos Ayres, has been covered with "camalotes" of all sizes as far as the eye could see, some half a mile long and from 50 to 100 feet wide, and others a few feet in diameter.

Expanded definitions

<p>Camalote or Camalotale</p>	<p>Newly-formed floating vegetation raft where <i>Eichhornia crassipes</i> (water hyacinth) typically composes the floating substrate, not yet replaced by organic soil. The term is sometimes applied to solitary water lilies.</p> <p><i>E. crassipes</i> has inflated stems and pink flowers and grows amongst exposed tree roots along river banks, but is more commonly found in lagoons with calm waters. The plant grows in compact groups of hundreds. Between the plants are found aquatic ferns such as <i>Salvinia</i> and <i>Azolla</i> and other small plants such as <i>Pistia</i>, <i>Lemna</i>, <i>Wolfia</i> and <i>Wolfiella</i>.</p>	
<p>Embalsado</p>	<p>Floating islands in the later stages of succession in which organic soil serves as the substrate binder, often dominated by <i>Cyperus giganteus</i> (Mexican papyrus). Embalsados retain soil brought to them by wind and water and may become real islands on which other plant species grow.</p>	

As the "camalote"- "embalsado" spectrum constitutes a continuum of ecosystem complexity, the terms are often synonymic, without regard to soil content. In the lower reaches of the Parana, for example, floating islands having soil content are known as "camalotes."

Argentinians Martin Iriondo, Juan Paggi and Maria Parma, in The Middle Paraná River: Limnology of a Subtropical Wetland (2007), however, explicitly reverse the definitions

One of the visible consequences of all floods and/or low waters of the Parana River is the drift of quite compact aquatic vegetation masses, constituted by one or more species, known as camalotes, "camalotales" (i.e., floating islands on river) or "embalsados" (i.e., masses of floating water plants).

Where may assist clarification, we'll opt for the first definitions, but we'll not alter nomenclature when quoting others.

This chapter will deal with camalotes in their landform sense. Chapters 42-48 make significant mention of the terrestrial macrofauna aboard the mobile islands. Chapters 28 and 82 contain accounts of camalotes and river management.

Soilless Floating Formations

The upper reaches of the Parana system straddle the borders of Bolivia, Brazil, Paraguay and Argentina.

The following species are the most commonly observed: *E. crassipes*, *E. azurea*, *Pontederia rotundifolia*, and in lower amounts, *Salvinia* spp., *Polygonum* sppt., *Pistia stratiotes* and *Azolla* sp.. Associations of aquatic gramineae ("canutillos") of *Echinochloa*, *Paspalum* and *Panicum*

elephantipes are also observed, usually covering large extensions in lentic environments and secondary rivers.

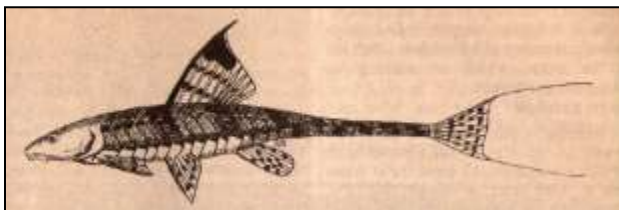
Leaves and stems of the Water Hyacinth are frosted during the Argentine winter, but its extraordinary reproduction allows the species to recover quickly. A single plant can increase to 1,000 plants every 50 days. When dissolved nutrients, elevated water temperatures and pH are adequate, the hyacinth can completely cover a marginal lagoon, blocking navigation and diminishing water oxygen content. "Los Camalotes Alfombran parte de la Costa del Rio de la Plata," Clarín, May 23, 1998, refers to a camalote of at least 6 square kilometers.

The aquatic roots directly absorb recycled minerals from the rhizosphere of their roots.

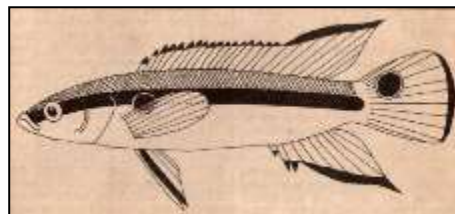
Surplus oxygen from the aerenchyme of the floating plants, as well as photosynthetic oxygen, form a film of around the roots and rootlets, i.e., a microenvironment which is much richer in oxygen than the surrounding waters.

Dead radicular tissue is recycled, together with other captured detritus, by a periphyton of bacteria, fungi and algae, which in turn serve as food for a multitude invertebrates, including red shrimp up to 2 inches long, a crab is less than one half inch in length, an amphipod which reaches one and a half inches in length, copepods similar to cyclops as well as limpets snails and such micro-invertebrates as rotifers.

The dissolved oxygen, the food supply and the protection of the roots attract fingerling fish. Juveniles find refuge between the roots from predatory fishes. Also among the long, black roots of the water hyacinth lives the aquatic frog *Lysapsus limelus* together with the mud-sifting Whiptailed Catfish and the Harlequin Catfish. The latter reaches only 2 inches when adult and appears in the La Plata during the winter and spring, probably after being transported in the camalote as they drift toward the sea. Other fishes found in this biotype include juvenile *Crenicichla*, the air breathing eel, *Symbranchus marmoratus*, the Banded Knifefish (also with air breathing adaptations), *Hypopomus breviorostris* the Dwarf Cichlid (*Apistogramma corumbae*) and numerous species of tetras.



Loricaria parva



Juvenile Crenicichla

The biotic milieu tends to be greatest near the edges of the floating vegetation, as below a large camalote, the oxygen concentration decreases towards the center of the formation.

Bolivia's Caceres Lagoon drains across the Paraguayan border to the Rio Paraguay, the lighter green waterway on the right of the aerial image below. From Bolivia (1914), by French explorer Paul Walle,

Sometimes the water flows from the [Caceres] bay to the [Paraguay] river, and sometimes from the river to the bay, according to the season. [The bay] is full of floating masses formed of algae and weeds, known as camalotes. In the bay, which is covered with these islands for nearly a third of its surface. these camalotes, mingled with shrubs, lianas, and all sort of vegetable growths tom from the banks, form floating islands which are often three or four hundred yards in diameter and more than twelve feet thick.



The disk-shaped plants in the lagoon photo are Victoria Regia water lilies, discussed in Chapter 22, which to add to the nomenclature mix are sometimes specified as a species as "camalotes."

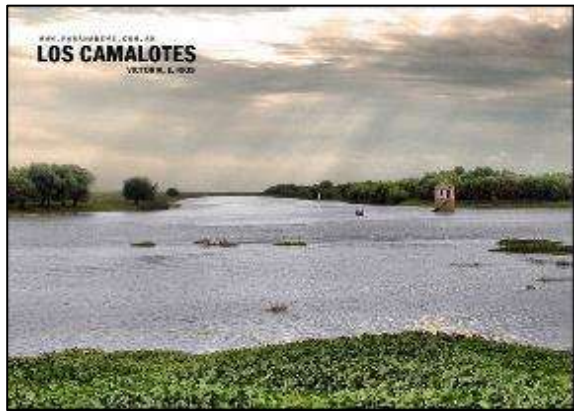


Over time, abandoned beds of the Parana River formed the 1.4-million-hectare Esteros del Ibera of Corrientes, Argentina, an independent and complex integrated network of swamps, marshes, lakes, and dammed and pluvial watercourses, the second largest wetland South America.

From "A Weird Floating Island," Washington Post, October 4, 1925,

To understand a "camalot," you must realize its origin. The Lake Ibera swamp lies on the east side of the Parana River, just below where the Alto Parana and the Paraguay unite to form the Parana -- Argentina's largest river and one of the large rivers of the World. The swamp, the second largest in South America, is "land bound" along its eastern edge, while its western edge forms the east, bank of the Parana for many miles, therefore, as the swamp grows internally, it pushes out into the river channel and the current of the river breaks off pieces which float down it. There are more or less "camalotes" going down the Parana after every rainy season in Paraguay and Brazil -- where the Paraguay and Alto Parana have their headwaters, but when there is an extra heavy rainy season in these countries or in northern Argentina, the rivers and the swamp become immoderately swollen and it is in such seasons that the swamp shores farther out into the river, the river current is much swifter and stronger and the camalotes are largest.

A brief tour,



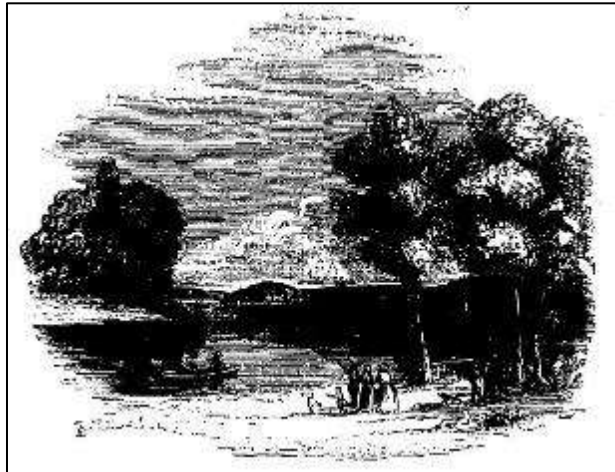
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Camalotes may drift from the lagoons to the currents of the river and begin a journey southward, coalescing, fragmenting, some decomposing, others blossoming. Formations move periodically due to floods, fluvial morphology, wind and precipitation. Iriondo, Paggi and Parma, (2007) found the 1979-81 daily mean flux in the middle Parana to be 0.15 hectares/day, with a minimum and maximum of 0.01 and 4.51.

"The Camalote, A Marvel of Tropical Vegetation," Merry's Museum, Parley's Magazine, Woodworth's Cabinet, and the Schoolfellow, July 1, 1858,

Perhaps you do not know what a camalote is. It is a gigantic water-lily which grows in abundance on the tropical banks of the Upper Parana and Paraguay rivers. Its leaves are large, and of a bright rich green. The under sides of the leaves are divided into innumerable little compartments and divisions, as accurately marked as if laid out with mathematical precision -- the root is a hollow bulb of thin material, filled with air, and depending from which are long bunches of fine fibers, that cling to whatever comes in contact with them.



The freshets loosen this camalote from its bed, and it floats down with the current in large masses, carrying with it everything that it may meet with on the surface. Sometimes these masses are half a mile in diameter, in ordinary times, and they generally lodge upon some

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island in the river, or upon some sand bank, which they soon convert into an island; so that very little camalote ever passes the mouth of the Parana Guaza into the Rio de la Plata.

This year the freshet is so heavy that the great mass of camalote was carried beyond the sand-bars and little islands above here, for they are all overflowed. It found a free course to the broad Plata, and I can assure you that its visit here is appreciated. The whole surface of our roads for miles is covered with camalote, and resembles a great meadow, gently moving with the tide. The green of this fine field is variegated with flowers of all the most brilliant hues and of the most exquisite fragrance.

"A South American Floating Island," Fort Wayne Journal Gazette, February 24, 1907,

The island in the picture is of the town Parana, Argentine Republic, capital of the province of Entre Rios. It is in the Parana River, which is over 2,000 miles in length and in flood time is twenty miles in breadth at this point. The island has moved a mile in the last five years and is slowly choking up the harbor.



"Odds and Ends," Wide World Magazine, March 1906

Our next photograph appears to show a tug-boat forcing a way for herself across a stretch of grass land. As a matter of fact, however, the "grass-land" is the great Rio de la Plata after a heavy flood which has brought down a collection of "camalotes," or floating islands.

The steamer Raphael making the port of Buenos Ayres.



Humboldt, in his "Aspects of Nature," describes the formation of these remarkable islands, gigantic water-plants, mostly of the lily species, growing thickly inter twined under water, with their leaves a tug-boat forcing its way through one of the extraordinary floating and flowers on the surface, gather up any driftwood that floats down the river.

When this collection of water-plant and driftwood has formed an almost solid and buoyant mass, unusually high floods force the roots of the water-plants out of the river-bed and let loose these floating islands. When they get to the tidal part of the river they cover a vast area. The River Plata not having many trees along its banks, these wanderers are not so formidable as the floating islands one sees on the Amazon, but what they lack in strength they make up in size, as will be seen from our photograph.

"Notes from a Journal in Paraguayan Waters," United Service Magazine, October 1874, describing a conversation aboard such a vessel,

"You must clear away the camalotes first. We've got a big one under our bows, but they've caught your paddlewheels, and you look as if you were in a turnip field."

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"We'll clear them away this evening, and to-morrow morning, and get away before noon."

"I mean to ride with a long scope of cable and a turn of port helm, and when we see them coming, starboard the helm and dodge them."

"I hope you may, for continual clearing them away is troublesome work."

Footnote

Floating islands. From the anchorage at Asuncion we could see about a mile up and a mile down the river which was about half a mile wide. The current running two knots, the surface in view was renewed every hour; therefore taking the most moderate computation, that one fiftieth of the surface was covered with these camalotes, some 30,000 acres must have floated put us in three months. The river was at a very unusual height. Some of these camalotes found their way 950 miles down, and tilled up the space between the two piers at Buenos Ayres.

That's 330 hectares/day, far exceeding Iriondo, Paggi and Parma's 4.51 three-year maximum for the downstream Parana. Even allowing for large errors of estimation, this suggests that most camalotes disintegrate in transit.

"Buenos Aires and its River of Silver." National Geographic, October 1921, by William Barbou. Parana

When day came the character of the country had changed. On each side stretched endless reaches of low, partially inundated country, densely wooded with strange tropical trees, interspersed with an occasional "feather-duster" palm. The wide flood was dotted with islands, large and small, among which the buoyed channel meandered. Camalotes, which the Spanish dictionary defines as "river plants in South America resembling a floating island," began to drift by. Usually only a few would be joined together, but occasionally our boat would swing abruptly aside to avoid patches which had collected about some floating uprooted tree to form islands fifty feet across.

Soil-Bound Floating Formations

The great esteros and lagoons contain embalsados having soil sufficient to germinate fixed-rooted emergents including tall graminoids, wetland herbs, climbers and even small trees.

Islands of Accretion

Floating formations in which soil matter has been washed or blown onto them and/or formed by organic decomposition. The islands may be retained temporarily by being "captured" by rooted hydrophytes such as *Paspalum repens* and *Ludwigia* and then colonized by such species as *Elocharis* sp., *Cyperus haspan*, *Scirpus cubensis*, *Rhynchorpora corymbosa* and even the arbust *Senna pendula*.

From a successive perspective, this can be thought of as a subsequent stage for the previously-discussed soil-free vegetative mats. Where islands are regularly destroyed by environmental action, smaller secondary species mat reflect the limited duration of floating mat. Massive secondary cover may occur on an accreted island trapped in a quiescent lagoon.

Eduardo Paz and Maria Bassagoda provide an example in "La Vegetacion Costera del SE Uruguayo: Ambientes y Biodiversidad," Documentos de Divulgacion, Museo Nacional de Historia Natural y Antropologia 5, July, 2002.

*In small ponds in the area of Aguas Dulces (Laguna Clotilde García Lagoon) or Laguna Blanca (Maldonado) floating islands are formed. These begin as tapestries floating aquatic fern (*Salvinia* spp.) remansados along the banks among the reeds. Slowly deposited sediments and plants grow on them (*Oxycaryum cubense*, *Cyperaceae*, *aranifera Habenaria*, *Orchidaceae*) and over time these acquire of a thickness of 60-70 cm.*

Islands of Catastrophic Origin

Buoyant terrestrial landscape fragments torn free from river or lagoon banks by high water are discussed in Chapter 22. In composition, such islands resemble the terrain from which they separated. Such formations can be capable of bearing larger mammals and amphibians (Chapters 42-45), passengers sometimes helpful in identifying the island's origin. Tree or large shrubs on a downstream-floating formation evidence such break-away origin.

From A. Hyatt Verrill's Islands and their Mysteries (1920),

In many parts of South America the rivers rise many feet during the heavy rains and the forests are flooded for miles. These forests are made up largely of trees with broad spreading surface roots, for the soil on which they grow is shallow and composed of vegetable mould [loose soil, rich in organic matter] resting upon a hard clay or rock foundation, and during the floods large masses of the forest floor often float free and are carried down the river with all their giant trees, their tangles of hanging lianas, and their animal life undisturbed.



Floating island, Corrientes, Bolivia. The soil is 1.8 meters thick.

Floating embalsados covering the shorelines of the Lagunas and Esteros del Ibera oligotrophic complex are dominated by *C. giganteus* and *F. robusta* with associated *Panicum*, *Talia* and *Zizania* spp.

"The River Parana: An Economic Survey," Geographical Journal 33.1 (1909) by W.S. Barclay.

The Laguna Ibera, however, as it is the largest, is also the most interesting of the three channels, owing to the prevalent fable and superstition concerning it -- to an extent amazing when the simple nature of its formation and comparatively easy access to its shores is considered. It is said to be impenetrable, and its watery wastes peopled by fugitive Indians from the old Jesuit missions, who still inhabit its floating islands and raise cattle on them.



"Laguna Ibera, Corrientes, Floating Island of Sudd." Barclay (1909)

Laguna Ibera today



Undated



The Pantanal basin in the Mato Grosso, the upper Rio Paraguay system near the border between Brazil and Bolivia, contains vegetation rafts formed seasonally covering hundreds of square kilometers during high-water, around 2.4 percent of the entire Pantanal.



Rooted and floating embalsados extend into 400 kilometers of the Parana's deltaic reaches, where floating mats of *C. giganteus* rise and fall with the water level and remain isolated from sediment inputs. Buoyant mats extend into estuaries with a tidal amplitude of about 1 meter if river discharge is sufficient to keep the water fresh.

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Chapter 28 -- Tango



Not precisely in tangoland, but in the same continent, above are pphotos from Guayna

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Chapter 28 -- Tango

And as for dancing upon disembarkation,



The image shows the musical score for 'Camalote'. The title 'Camalote' is at the top, followed by 'Tango Criollo' and 'por ANTONIO SINOPOLI'. The score is written for guitar, with the word 'GUITARRA' at the beginning. It consists of several staves of music, including a treble clef staff and a bass clef staff. The music is in a 2/4 time signature and features a mix of eighth and sixteenth notes, typical of tango music. There are some performance instructions like 'Andante' and 'Moderato' written above the staves.

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CHAPTER 29 WALTZ

More than Johann Strauss's Blue Danube are danced along that river, but the Austrian's work would be the pirouette of choice for the basin's floating islands.

Flowing eastward to the Black Sea, the Danube River draws from 14 countries, the major being Austria, Hungary and Romania.

We'll briefly tour those three nations in quest of floating islands.



Austria

From an unattributed 1778 witness, quoted in "Der Hautsee mit der Schwimmenden Insel bei Dönges," Heimatblätter 93 (1994) by Wolfgang Sinn and Heinrich Weigel,

*On the lake floats a flat piece of earth or crust,
like the skin on the milk.*

Thus the name, Hautsee, "skin sea."



"A Restless Patch of Earth," Bucks County Gazette, February 1, 1907,

There is near to the Thuringen summer resort Traunensee a curious and locally celebrated phenomenon -- namely, the floating island which disports itself it will now at this and now on that side of the Hautsee, a small and charmingly situated lake... The great event of the year is the Volksfest held upon the island every Ascension Day when dancing and bratwurst eating washed down by the obligatory beer is the order of the day.

"A Curious Floating Island," Rapid City Marquette Reporter, April 25, 1907

Near Traunsee, a summer resort in Thuringia, Europe, is a curious floating island that drifts about on pretty Lake Hautsee. Last season it was moored alongside the public road and was visited by a great number of tourists.

This little island, when unrestrained, drifts peacefully about the lake, and is a favorite abode of birds. Wild ducks and other aquatic fowl are especially partial to its shores.

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It has its own peculiar flora, differing from that on the adjacent mainland. Flowers and edible berries grow in great profusion, while slender birch trees cast their shade over those who land upon the restless little patch of earth.

*One of the peculiar plants of the island is the *Drosera rotundifolia*. which I called the "meat consuming" flower, because of its appetite for flesh,*

From Old Countries Discovered Anew, A Motor Book for Everybody (1913) by Ernest Talbert,

Climbing the hills out of Marksuhl the road passes close to Hautsee, a lake containing a floating island.

According to "Ripley Explains," Biddeford Daily Journal, June 21, 1935,

Wandering Island.

The Haut Lake near Marksuhl in Thuringia, Germany, covers an area of about 5 acres, and is 22 feet deep. Its greatest natural curiosity is a floating island which is 78 feet long and 26 feet wide. The island is covered with verdure and trees and consists largely of a foundation of peat moss.

"A Restless Patch of Earth," Auckland Star, September 15, 1906, conveys a bit of the local lore.

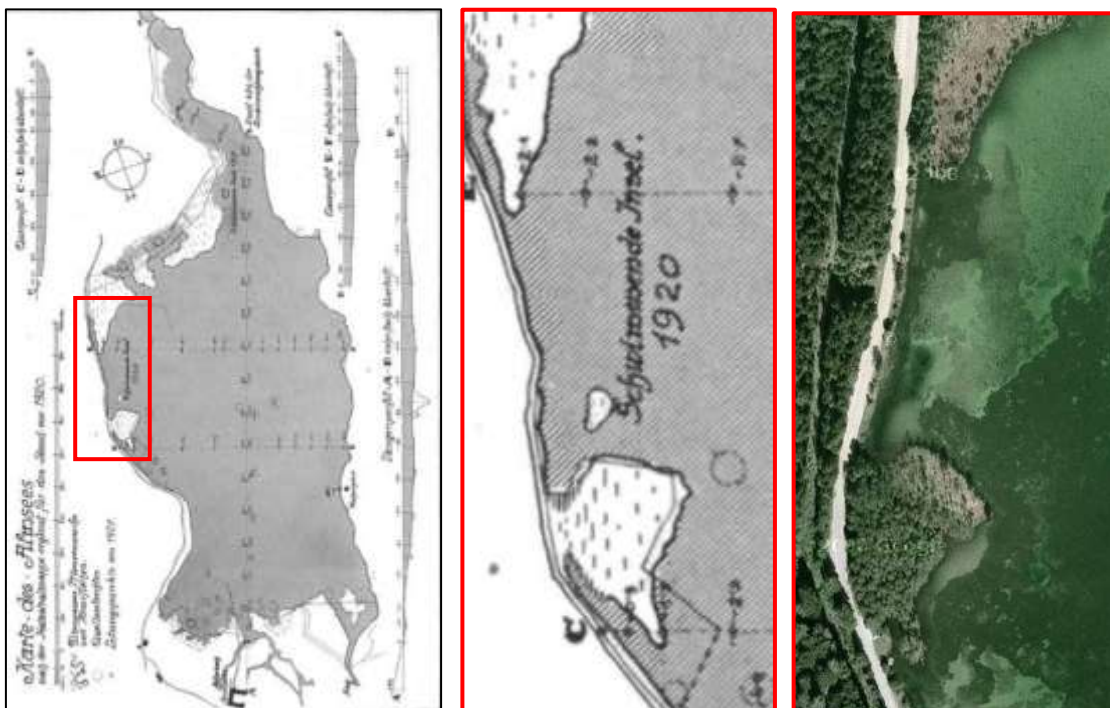
There is, near to the Bavarian summer resort Trauensee a curious and locally celebrated phenomenon, namely the floating island which disports itself at will, now on this and now on that side of the Hautsee, a small and charmingly situated lake. At the present moment, the peripatetic little island has elected to "anchor" itself alongside of the public high road.

*The little island has its own flora, varying from that on the immediately adjacent mainland, among which may be mentioned the "meat-consuming" *Drosera rotundifolia*, while flowers and edible berries grow here in rank profusion, and slender birches cast their shade over those who care to land and investigate this restless little patch of earth. Birds are especially partial to this spot, wild ducks and other aquatic birds breeding here in great numbers. But the great event of the year is the "Volksfest" held upon the island every Ascension Day, when dancing and bratwurst-eating, washed down by the obligatory beer, is the order of the day.*

The floating island of Almsee was 25 meters long, 15 meters wide and 1.5 meters thick in 1927 and vegetated with *Sphagnum* spp., *Picea excelsa*, *Alnus glutinosa*, *Angelica sylvestris*, and *Solanum dulcamara*.



As can be seen in the aerial photo below, the island mapped in 1920 no longer exists.



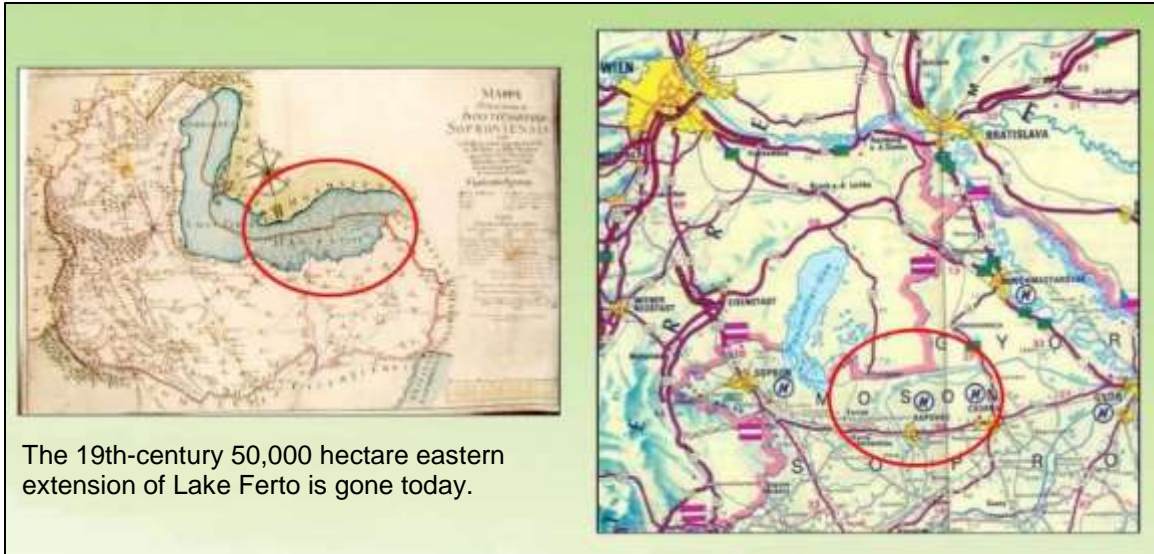
Hungary

Hungary's reach of the Danube was once a continuous marshland, 2 to 3 meters lower than its surroundings, characterized by swamps, marshes, broom bushes, flooded meadows scattered by lakes and floating islands. Historical descriptions mention 3 to 4-meter deep lakes.

In *Notitia Hungariae Novae Historico Geographica* (1735-42), Matyas Bel describes floating islands covered with reeds and grasses in a lake near the castle of Tata. Floating islands between the Tisza and Bodrog rivers were used for pasturage until the second half of the 19th century.

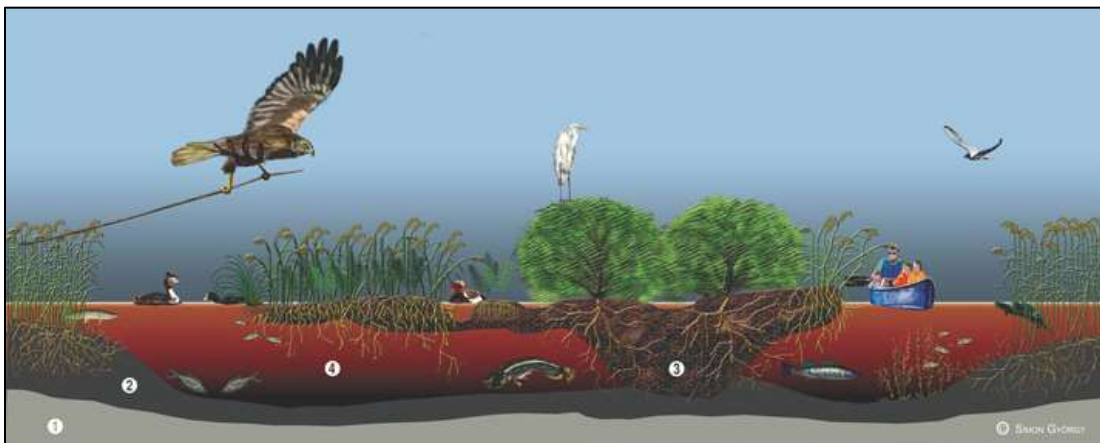
Drainage schemes had little success, although there are reports describing an increased haymaking area. When the channels were not maintained or the weather was wet, the wetlands quickly reappeared.

Reclamation by means of mechanical excavation was more successful in the early 1900s. Most of the lakes disappeared, the peat-bogs desiccated and crumbled and secondary meadows formed in all but a few habitats where morphological conditions retained the water. The largest of the surviving marshlands was incorporated in 1994 into the Fertő-Hanság National Park, where hillocks ("goronds"), former marsh islands, rise a few meters above the water surface.



Lake Velencei has an area of 26 kilometers, a third of which is covered with fen orchid (*Liparis loeselii*), marsh ferns (*Thelypteris palustris*) hedge bindweed (*Calystegia sepium*), lesser pond sedge (*Carex acutiformis*), greater pond sedge (*Carex riparia*) and bittersweet nightshade (*Solanum dulcamara*). Clay lenses separate the basal peat from the Sphagnum deposited during storms)

Marsh pieces torn away by storms float on the water, drifting with the wind. Older fishermen know such vagrant pieces as “ragged”





Lake Balaton is the largest lake in Central Europe and one of Hungary's foremost tourist destinations. The River Zala provides the largest inflow and the canalized Sio, the only outflow. Note the peat islands.



Romania

The 6,000 square kilometer Danube Delta (2.5 percent of Romania's territory) is characterized by its many hundreds of river islands. A classic triangular-shaped delta. The Delta's 1,000-square-kilometer Plav (or Plavy or Plaur, depending on language) remains the most extensive floating marsh in Europe. The compact raft-like structure, 60 to 200 centimeters in thickness, is comprised of interlaced rhizomes with soil filling the interstices. The dominant vegetation is the common reed, *Phragmites*, often 5 to 7 meters tall. Some Plav is believed to be thousands of years old.

Two to 300 square kilometers of the Plav are substantial enough to support the weight of a human



Marsh fern is abundant below the reed canopy and, as the formation matures, succession moves toward saw sedge, greater pond sedge and bulrush. As the substratum as basal rhizomes die off, the raft detaches from the bed.



Floating marsh in Chiril Lake

"Varieties, Literary and Philosophical," *The Universal Magazine of Knowledge and Pleasure*, March 1811, estimates an island's travel to be 8 miles.

Floating island. -- A small island of the Danube, called, Engel, near Pichment, has exhibited the phenomenon of a Floating Island. In the memory of the oldest persons, it had remained stationary until May last, when the rapidity and pressure of the stream are supposed to have detached its bottom; its inclination is uniformly to the right bank of the river, but its motion is not perceptible. Since May, it has made a progress of about eight miles; and, what is not the least singular, has, from the eager and unabated curiosity of the Germans, made the fortunes of three persons who obtained a temporary proprietorship of it.

Weekly Review, March 13, 1908, increases the estimate by a factor of ten.

An island of the Danube called Engle, near Pichment, began one day in May, 1810, to float and moved a distance of eighty miles before it stopped.

Marietta Pallis visited and studied the Delta in 1912 and again in 1913. "The Structure and History of the Plav: The Floating Fen of the Delta of the Danube," *The Journal of the Linnaean Society* 43 (1916) provides description.

It has two well-marked portions, an aquatic and an aerial. The aquatic portion consists of interlaced reed-rhizomes, closely bound together by the numerous branched water-roots of the reed which retain much soil, and thus completely fill the interstices between the rhizomes. Hence there results a compact raft-like structure, the general surface of which projects about 4 cm. above the surface of the water, and measures from about 0.8 m to about 2 m. in thickness. From this raft rises a thicket of reed, formed of the aerial continuations of the reed-rhizomes, that is, both of sterile leaf-bearing and flower-bearing branches. The flower-bearing extremities often measure as much as 5.15 m., and the total length of the shoot, viz. vertical rhizome plus aerial extremity, sometimes reaches a length of 7.15 m.

The areas covered by Plav are not in general great, and owing to the dense and tall growth of the reed cannot easily be estimated. I have walked over many but have, with a single exception, been unable to keep one direction for more than about 10 minutes, and I have usually encountered a break in the continuity of the Plav very much sooner.

Plav has at least three distinct layers of soil. Normally, there is

- 1. The top layer of black earthy-looking soil usually from about 6 cm. to about 15 cm. in thickness, contributed by the land plants,*
- 2. A layer of fine soil of a dark brown color whose organic content is about 40.7 percent, and*
- 3. A basal layer of coarse brown soil with an organic content of about 17.6 percent.*

The fineness of the soil of layer (2) is probably due in part to the breaking up of the soil by the roots of the accompanying plants, and also to the fact that the coarser inorganic matter carried by the floods has to filter through layer (3) first.

I did not estimate the organic content of layer (1), but its soil is almost black, and must therefore contain a higher proportion of organic matter than layer (2). The floods do not come into direct contact with this layer, hence its inorganic matter is probably only plant-ash.

Many long water roots, clean because suspended in the water, hang from the base of the Plav. Inside the Plav layer there are many mud-roots; that is to say, thick unbranched, or almost unbranched, roots, often of great length. Many of these roots are constricted at frequent intervals.



Lake Iacob, Romania

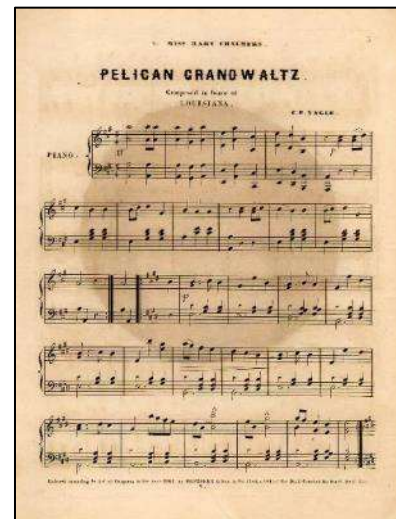
The Delta today is the breeding, feeding and resting area for some 300 bird species. Seventy percent of the world's Great White Pelicans summer there, as do 60 percent of the world's Pygmy Cormorants, Five percent of the global population of Dalmatian Pelican nests on floating islands in Lake Hrecisca alone.

Wild boar, otter, stoat, mink and wildcat are also found on the floating islands and over 3,400 species of aquatic fauna, representing 98 percent of the European total.



Although dams have reduced the sediment load to half that of 1960, Delta accretion still, outpaces sea-level rise. Mobile islands obstructing small boat navigation are burned by the locals. A quarter of the waterways in the delta have been embanked and over 80 percent of its wetlands and floodplains have been destroyed.

In deference to both the Delta's endangered pelicans and the endangered islands upon which they breed, we'll close with a waltz of Strauss's day, though by another.



CHAPTER 30

ROCK IT

Let us be clear that in this chapter we're discussing a phenomenon that's rare in nature, floating isles of stone. We give the topic a chapter, however, because such islands loom large in our imagination.

Mention "floating island" to a friend whose not thought much about the subject, and he or she will more likely envision a bobbing slab of feather-weight rock than a soggy mass of decaying vegetation, though at any given time, the world contains lots of the latter and almost none of the former . Floating plant-life, we must admit, sounds unsubstantial, maybe a bit slimy, not where we'd opt for our mind (or our rowboat, for that matter) to take us. An island of floating stone, on the other hand, seems lasting, stable, worth exploring.

Georgius Agricola's De Natura Fossilium (1546), translated by Hubert Hoover, presents a modern understanding of pumice.

All are porous and light because of the internal cavities filled with air. Due to its porosity it will float on water as do other purnaceous stones no matter how large they may be... Pumice which floats when whole will sink when crushed

In De Natura Eorum of the same year, Agricola hypothesizes the floating "eggs" of Spanish clay noted by Strabo to be of "pumice glass," but erroneously extends his lithographic explanation to the floating islands in Saxony, which we today know to be peat, not pumice.

Like a carbonated beverage in a bottle, molten magma deep within the earth, carries gas held in solution by the surrounding pressure. When the pressure is suddenly reduced, as in an eruption, the gas dissolves out of solution in rapidly expanding bubbles, the expansion potentially violent. The magma is torn apart by the expanding gases at the same time that it is freezing into solid glass fragments, and these fragments are carried high in the air by the eruptive process. The smallest fragments often retain little evidence of the bubbles that formed them, but when the explosive process is incomplete, a glassy froth of bubbles, or pumice, results. Pumice can have a porosity of 80 percent,

Soils have occasionally been reported to float, an example being "Inquiries for Virginia and the Bermuda's," Philosophical Transactions of the Royal Society of London 2.23, 1667.

Concerning the Varieties of Earths 'tis said, there is one kind of a gummy consistence, white and clear: Another white, and so light, that it swims upon water:

If the report has merit, the "Earth" is most likely pumice. The Virginia/Bermuda claim is questionable, however, as pumice isn't found there and there has been no corroboration in three centuries.

Falling upon water, both pumice and ash are buoyed by surface tension, but as ash flakes are themselves relatively dense, they sink as soon as the surfaces are wetted by agitation. A pumice particle (a "clast"), on the other hand, encapsulates its gas-filled interstices and can float until capillary forces finally penetrate the particle's interior, a process that can be slow. Fragments of pumice are sometimes found floating in oceans many months or even years after a volcanic eruption.



We'll begin with the very-likely possibility that some Classical floating-island mythology may be related to volcanic events.

Cyprus, c. 1500 B.C.

Pieces of rounded pumice occur near the top of the raised beach deposits near Ayia Irini and along the coast. The deposits probably originate from the Greek islands or southern Italy.

In 1500 BC, for example, the Island of Santorin erupted and showers of pumice were shot high into the sea



Al-Sayyara, perhaps Persian Gulf

L'abrégé des Merveilles (1898) is a translation of a 1484 manuscript by an unknown Arab, describes Arabic mythical ideas in the tenth century. This one surely involves pumice.

In the great ocean is an island which is visible at sea at some distance, but if one tries to approach it, it withdraws and disappears. If one returns to the place one started from, it is seen again as before. It is said that upon this island is a tree that sprouts at sunrise, and grows as long as the sun is ascending; after midday it decreases, and disappears at sunset. Sailors assert that in this sea there is a little fish called "shakil," and that those who carry it upon them can discover and reach the island without its concealing itself. This is truly a strange and wonderful thing.

The island of as-Sayyara. There are sailors who assert that they have often seen it, but they have not stayed there. It is a mountainous and cultivated island, which drifts towards the east when a west wind is blowing, and vice versa. The stone that forms this island is very light. ... A man is there able to carry a large mass of rock.

But we needn't rely of ancient stories.

Santorini, Aegean Sea, 1707

A Survey of the Wisdom of God in the Creation: Or a Compendium of Natural Philosophy (1823), by John Wesley, a commanding authority, though perhaps not regarding matters geological,

After a shock of the earth, there was seen from Santorini, (an island in the Archipelago, on the coast of Natolia) on the 23d of May, 1707, as it were a floating rock. Some were so bold, as to go down upon it, even while it was rising under their feet. The earth of it was very light, and contained a small quantity of potter's clay.

Insulis Natantibus (1711), by George Munz,

It is certain that the floor of the Aegean Sea abounds with pumice. Left to itself, pumice easily floats due to its lightness, and is merely waiting for some cause that will release it from its bonds at the bottom of the sea. These causes are subterranean fires, earthquakes, and waves, whose impetus easily breaks free whole pieces of pumice, thrusts it up from the bottom to the surface. Whenever such a cause is present and exercises its force on this material, floating pieces of land emerge on the surface of the water, which either by themselves or joined with others, present the appearance of a floating island as long as they remain free and separate from the bottom or the shore of the sea.

It is because they did not remain free from the bottom (although this has not happened for a long time in this type of island birth) that neither the island born in the Aegean in 1707, nor other islands born in the same region by the same means, ever bore the name of floating islands, and even of Delos' ancient and protracted buoyancy hardly a shadow remains.

Tambora, Indonesia, 1815

"Honourable Company's Cruiser Benares," Asiatic Journal, August 1816,

Massive rafts of pumice and tree trunks, some of them several kilometers across, floated in the Gulf of Saleh and the Flores Sea. Some pumice rafts were almost 5 km across, and still hindered navigation between Moyo and Sanggar three years after the eruption. The Benares encountered them when it first approached Sumbawa, and soon ran into difficulties.

On approaching the coast, passed through great quantities of pumice-stone floating on the sea, which at first had the appearance of shoals; so much so, that I hove too, and sent a boat to examine one, which at the distance of less than a mile I took for a dry sand bank, upwards of three miles in length, with black rocks upon several parts of it, concluding it to have been thrown up during the eruption. It proved to be a complete mass of pumice floating on the sea, with great numbers of large trunks of trees and logs among it that appeared to be burnt and shivered as if blasted by lightning. The boat had much difficulty in pulling through it; and until we got into the entrance of Bima bay, the sea was literally covered with shoals of pumice and floating timber.

Sandy Island, Coral Sea, 1876

In 1774, Captain James Cook charted a "Sandy Island" near what was to become New Caledonia. French maps from 1826 and 1875 show "Ile de Sable(s)" at the location of Cook's "Sandy Island."

In 1876, the whaler *Velocity* reported as having discovered an island characterized a series of "heavy breakers" and "sandy islets," though not at Cook's location. As it was standard practice to

list all potential navigation hazards, Australian Maritime Directory (1879) incorporated the apparently-reconfirmed discovery.

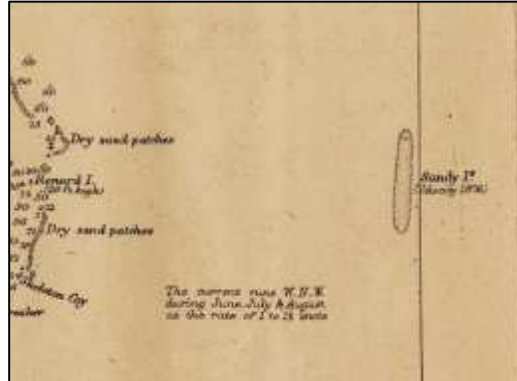
In 1876, the master of the whaler Velocity reported that while cruising on the eastern side of the Chesterfield and Bampton reefs, he observed heavy breakers in lat 19' 50' S long, 158' 50' E.

The master of Velocity also reported a line of sandy islets as extending about North and South along the meridian of 159' 57' E, between lat 19'7' S and 19'20' S."

Thus came to be known as "Sandy Island."



Karte von Australien oder Polynesien, 1792. 'Sandy island' on the other side the of New Caledonia



"Australia Coral Sea and Great Barrier Reefs shewing the Inner and Outer routes to Torres Strait... with Additions from Admiralty Surveys in Progress to 1888"



British Admiralty chart, 1908



Sovereignty and Mandate Boundary Lines of the Islands of the Pacific, National Geographic, 1921

Latter charts affixed the abbreviation "ED" (existence doubtful) next to Sandy Island in recognition of subsequent failure to spot the reported island.

Due to a lack of confirmation of an island or depths indicating a shallow reef, Sandy Island was removed from the official French hydrographic charts in 1979.

On a study of plate tectonics in 2012, the R/V Southern Surveyor found no island and recorded depths never less than 1,300 meters, but the invisible feature remained on Google Maps until November 2012.



It is now suspected that the reported sighting may have been that of floating pumice that would have lasted no more than a few months at most.

Krakatoa, Indonesia, 1883

Pumice from the May eruption floated westward at a fairly regular speed of 23 km/day and some was already 2000 km from Krakatau at the time of the August paroxysm, said to have created the largest sound ever heard by human ear.

After August, the large bays near Krakatau were choked with pumice that was not cleared until December and the Sunda Straits continued to supply large quantities of pumice to neighboring oceans whenever unusually high tides or storms for months afterward buffeted the voluminous shoreline pumice deposits.

The Eruption of Krakatoa and Subsequent Phenomena, Report of the Krakatoa Committee of the Royal Society (1888), G.J. Symonds, ed.,

Krakatau generated mild detonations from Perboewatan throughout May and June of 1883. Over the ensuing months, storms and high-tides would disperse thick banks of floating pumice beyond the Straits, into the Java Sea and Indian Ocean. Ships thousands of kilometers from Krakatau would report huge fields of this floating debris for months after the eruption. One such accumulation floated 8,170 km, until it reached Durban, South Africa in September, 1884.

Ships navigating the seas near Krakatoa reported that in certain areas floating pumice had formed a layer about 3 meters thick. Near the volcano huge masses of pumice from the eruption floated in the sea and were thick enough to interfere with navigation. Pumice formed large and thick floating rafts some of which crossed the Indian Ocean in a 10-month period. Others such rafts of pumice reached Melanesia, and were still afloat two years after the eruption.

"The Volcanic Eruption of Krakatoa," Atlantic Monthly, September 1884, by E.W. Sturdy,

During these weeks vessels passed through extensive fields of pumice spread over the surface of the sea. Some of these pumice nodules, picked up about the 11th or 12th of July, in latitude 6° S. and longitude 94° E., were very large and considerably worn; several lumps were covered with barnacles an inch long, which represented at least four weeks' growth. On August 1st, in latitude 6° S., longitude 89° E., seven hundred miles from the coast of Sumatra, a steamer passed through a field of floating pumice; and here the current was running eastward fifteen to thirty miles a day. The soundings at the spot reached two thousand fathoms. It is known that a

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center of volcanic disturbance exists in the Keeling Atoll, situated six hundred miles west by south from the mouth of the strait; and it is also known that pumice ejected from the sea bottom rises to the surface. The currents of the Indian Ocean will show that any flotsam in the region between west and south of Java Head in that longitude could be drifted to the locality in which it was observed in the month of July.



Chromolithograph, seven weeks after the eruption.
Krakatau in distance, across pumice-filled sea.



Recent photo

A vessel passing through Gaspar Strait on November 23 reported that at places in the Java Sea the floating pumice was so thick that headway was almost impossible with light breezes. Another reported encountering quantities of pumice stone, large trees, bushes, and roots in the southwestern Java Sea, on December 21.

"The Volcanic Eruption," Oshkosh Northwestern, August 31, 1883,

The captain of a steamer which was in the straits of Sunday during the recent volcanic eruptions reports that ashes fell on the deck of his vessel to the depth of 18 inches. He passed masses of floating pumice atone seven feet in depth,

"Singular Phenomenon at Sea," Adelaide Observer, December 29, 1883,

Referring to the steamer Bothwell Castle, which arrived' at the Semaphore from London on Saturday, our Shipping Report states that on December 6, in lat. 80S, long. 80E, the ship entered a vast field of pumice, through which the vessel steamed for 1,250 miles. Sometimes the masses were so thick round about the vessel that the seamen walked about on the patches. As the steamer crashed through the lumps there was a continued crackling creaking noise of singular character, and it became a source of amusement to pick up the lumps every now and then, but there were no appliances [to hold] the larger fragments.

The steamer Loudon was steaming down the Sumatran coastline when Capt. Lindeman saw that floating pumice blocked the channel. He steamed back up Lampong Bay, seeking a passage on the western side of the bay, but even there the way was barred by. He determined to force a passage and the layer of pumice parted, piling up at the bow and disclosing its depth as ten feet.

"Report from H.B.M. Consul at Batavia, inclosing Extract relating to the Volcanic Outbursts in the Sunda Strait, from the Logbook of the Steam-ship 'Governor-General Loudon'," Proceedings of the Royal Society of London 36 (1883-84) by T.H. Linderman and H.G. Kennedy,

When we got about two English miles off Pulo Tiga, it appeared that a connection had been formed between the islands just mentioned stretching to Seboekoe Island, and thence to the mainland. Whether this connection was formed out of solid ground or only out of pumice- stone and trunks of trees is not known. What is certain is, that at the distance at which we then lay, it looked exceedingly like solid ground, and so we thereupon turned back in order to look for another passage.

Having got outside we discovered that here also we were entirely shut in ; so steamed very slowly, stopping every now and then close by the so-called layer, and made it out at last to be

floating pumice-stone, through noticing" that the layer was heaved up and down by the motion of the surf .

Now steamed somewhat faster, and when we got into the middle of the layer before referred to found it to be 7 or 8 feet thick. It took us ten minutes to get clear of it, and then we held our course south of Krakatau.

"A Tabulation of Dates at Which, and the Locations Where, Pumice or Volcanic Dust Was Seen in the Indian Ocean in 1883-4," British Association for the Advancement of Science 55th Meeting (1885), by C. Meldrum, noted 130 pumice sightings.

"Singular Phenomenon at Sea," Adelaide Observer, December 29, 1883, is quoted in Tom Simkin and Richard Fiske's Krakatau 1883: The Volcanic Eruption and its Effects (1983) describing a field of floating pumice encountered by the steamer Bothwell Castle on December 6, 1883.

Sometimes the masses were so thick round about the vessel that the seamen walked about on the patches



0.9 mm-long piece of pumice from the 1883 Krakatau eruption

An enlargement on the left; showing the thin, delicate walls of the network of tiny vesicles.



In "Krakatoa," Nature, July 24, 1884, Stanley Rendall describes large patches of floating pumice, some lumps being "roughly speaking about as big as a cwt. sack of coals," i.e., about 50 kilograms.

We first came across distinct evidences of the eruption about 200 miles before we entered the Straits of Sunda, in small isolated pieces of pumice-stone, which became much more numerous and finally took the form of yellow patches constituted by morsels of pumice varying in size from a pea or even smaller up to a cocoa-nut, rarely larger.

Between the island and Batavia we passed a few more floating patches of pumice as above described. After about eight days at Batavia we steamed down the coast to different ports, Cheribon, Tegal, and Samarang, being on the whole about three weeks away from the time we left Batavia to our return there, which took place, so far as I can remember, on January 1. On nearing Batavia again we passed through large patches of pumice- stone, patches of several acres in extent, some of the lumps forming them being of large size, roughly speaking about as big as a cwt. sack of coals, and all sizes below that down to coarse dust.

Early in the morning one of the officers called me to look at an immense floe of pumice-stone that was bearing down upon the ship, and very soon we were entirely surrounded, and formed the center of about, I should think, a square mile. Though covering a large surface, there was evidently no great depth of matter. One could pick it up by throwing a bucket or heavy pail into the mass, and a small steam launch easily made her way through it to our side. We left Batavia

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early in the morning, and passed through two or three such collections, all making their way in the same direction by the action of a current, as there was no wind, the sea being perfectly calm.

When about thirty miles from Batavia, we met coming towards us an immense field, similar, except for its greater extent, to those already described. I could not tell you by any means exactly how large a surface it covered, but at one time could only just make out the edge we had entered it at with the naked eye, and could not see its termination in the opposite direction with the ship's glass, so that it was at least several miles in extent. Also the depth of the pumice-stone bed was very great, offering considerable resistance to the ship's progress, as shown by its diminished speed.

An iron fire-bar thrown over the side rested on the surface of the mass, instead of sinking. Large trunks of trees were not floating in the water, but resting on the surface of the pumice.

Holding up an iron bar is indeed a graphic description.

The passage of our vessel left a wake of only a few feet, which speedily closed in again, so that to see it at all I had to lean over the stern and look under it as it were. It seemed exactly as if we were steaming through dry land, the ship acting as a plough, turning up on each side of her a large mound of pumice, especially noticeable on looking over the bows. Our passage through this made no great noise -- just a soft sort of crushing sound. The effect was very striking and queer.

I thought it curious meeting such immense quantities of the debris in the same place where, a month or five weeks earlier, only a few scanty, isolated patches existed. It was not due to a new eruption, so must be accounted for by the currents massing together a large number of scattered patches, or perhaps a certain amount had first sunk, and then, later on, had risen to the surface.

Re-flotation, however, would be most unlikely, as, unlike peat, gasses would not be regenerated.

A December 29, 1884, letter to Nature suggesting a Micronesian destination of tree-bearing pumice rafts like those described above.

Dr. Pease reports a considerable drift of pumice-stone landed for several months past upon the west shore of Kusaie. Many pieces are from twelve to sixteen inches thick, and loaded with barnacles. I have now before me a piece of pumice presented by Dr. Pease, with small barnacles attached. Dr. Pease also reports many large trees landed there of late. They are up to five feet in diameter, with huge buttressing roots, much pumice jammed in the roots, their wood as light as cork. This species of tree is unknown in Micronesia. Are these corky trees, as well as the pumice, part of the wreckage of Krakatoa?

From the log of Charles Reeves, Captain of the Umvoti, carrying emigrants between India and Durban, South Africa,

I first met with the pumice on 5 January, 1884 in 23S, and 70E [4232 km WSW of Krakatau], at first a few detached pieces about the size of a brick, directly afterwards it became very abundant lying in ridges the general direction of which was SE and NW (evidently laid in that manner by the SE trade winds) and in some places so thick that there was only the space of a few feet between the ridges, in fact the ocean seemed quite covered with pumice. I lost sight of it in 3-1/2S [3320 km W of Krakatau], so that it covered more or less 1170 geographical miles of Latitude and how many of Longitude I can't say. Nothing illustrates more than this the amazing vigor of this eruption.

I lowered a boat and collected a boat load of it. It was curious and interesting to note how it had been utilized by animals and low types of life as habitations and breeding places. There was a fair stock of barnacles on each large piece. Some had been patronized so extensively that they had lost a great deal of their flotation, and it was a question if they would float long enough to reach far distant Africa, but rather would sink to the bottom overweighted and over-colonized.

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On June 25, 1884, after several more crossings between Madras and Durban, Reeves notified the Royal Society.

And from seeing the pumice again on my passage up to India I have come to the conclusion that none will float long enough to reach Africa. It is now quite waterlogged with marine growths and will soon sink to the bottom."

Some days we would pass through pumice lying in ridges each piece uniformly the size and appearance of a bath sponge, then again we should pass through perfect fields of small yellow pumice spread evenly over the surface just for all the world like a green field of grass covered all over with buttercups, and the undulation of the swell of the trade wind produced an indescribably pretty appearance.

May 4, 1885, Reeves noted that pumice did indeed reach Africa, but that more remained in the Indian Ocean 21 months after the paroxysm.

The main body of the pumice passed Natal in September and October last and a large quantity was cast ashore there on the 29th of September, 1884. Yet an immense field is floating about between the Maldives and Ceylon, seemingly like the Sargasso Sea is in the Atlantic, only in the one case weeds and in the other pumice, for miles and miles the sea is covered with a thick coat of pumice, on the top of which are numerous crabs and beneath are very many strange small fish making it a home and shelter.

Coral and Atolls. A History and Description of the Keeling-Cocos Islands, (1912) by Frederic Jones,

Most of the pumice that comes to the atoll today is still the remains of that great upheaval of 1883, when the eruption of Krakatua altered the whole of the topography of the Sunda Straits. This pumice has been touring the ocean for over twenty years, and still, in the Sunda Straits, some set of current will send whole masses to sea, and a ship will steam for half an hour through the bobbing white balls of pumice which are launched upon an indefinite, and an irresponsible, journey.

Krakatoa (1964) by Rupert Furneaux,

Captain Lindemann, anxious as he was to leave Telok Betong, found the darkness too great to sail from Lampong Bay before 4 a.m, on August 28th. By daybreak, the Loudon was steaming slowly down the Sumatra coastline, making for the channel between Sebokoe Island and the mainland, through which Lindemann expected to make his way to Anjer. When the Loudon was still two miles away, Lindemann saw that "a connection had been formed between the island and the mainland." Floating pumice blocked the channel. Lindemann sought a passage between Sebokoe and Sebassi; that channel was also completely blocked. Lindemann steamed back up Lampong Bay, seeking a passage through the Straits of Lagoendi on the western side of the bay. Even there the way was barred by a large expanse of pumice. He determined to force a passage. Slowly the Loudon pushed through the obstruction. As the vessel forged ahead, the layer of pumice parted, piling up at her bows and disclosing its depth as ten feet. It took the Loudon ten minutes to get clear and into open water.

Rio Negro, Amazon, 1884

The Naturalist on the River Amazons (1884), by Henry Bates,

The fishermen twice brought me small rounded pieces of very porous pumice-stone, which they had picked up floating on the surface of the main current of the river. They were to me objects of great curiosity as being messengers from the distant volcanoes of the Andes -- Cotopaxi, Llanganete, or Sangay -- which rear their peaks amongst the rivulets that feed some of the early tributaries of the Amazons, such as the Macas, the Pastaza, and the Napo. The stones must have already travelled a distance of 1200 miles.

I afterwards found them rather common; the Brazilians use them for cleaning rust from their guns, and firmly believe them to be solidified river foam. A friend once brought me, when I lived at Santarem, a large piece which had been found in the middle of the stream below Monte Alegre, about 900 miles further down the river; having reached this distance, pumice-stones would be pretty sure of being carried out to sea, and floated thence with the northwesterly Atlantic current to shores many thousand miles distant from the volcanoes which ejected them

Katmai, Alaska, 1913

"The Recent Emption of Katmai Volcano in Alaska," National Geographic, February 1913, by George Martin, mentions floating pumice 12 inches thick.

The pumice is being washed into the sea by the combined action of streams, waves, and tides. There it forms great floating fields, which migrate with the winds and tides and greatly impede the navigation of small craft such as ours. An immense field of pumice which visited our anchorage at Takli Island is shown on page 178. The view shows the distance to which a dory could be forced into it.



This visitor came and went under the influence of tidal currents and winds, and constituted a menace which led us to seek a more sheltered nook for our boat. Even this was invaded by the floating rock, which jammed tight around and carried our boat with it when it moved in spite of two anchors and two pieces of pig iron down, and forced us to make fast to a projecting cliff.

The floating pumice was twelve inches thick alongside the boat and possibly was much thicker in the center of a large field. Fishermen reported a pumice field dense enough to support a man in Shelikof Strait. The pumice, once in the sea, will drift around until it is thrown high upon some beach, is ground to powder, or finally becomes waterlogged and sinks.



South Sandwich Islands, 1962

Floating pumice covering at least 2,000 square miles was encountered in the vicinity of the South Sandwich Islands in the south Atlantic Ocean by the ice patrol vessel HMS Protector on March 14, 1962. The source is considered to have been a submarine eruption to the west, and the record of an earthquake in that area on March 5, 1962, would seem to confirm this.

Southern Coast, Australia, 1964

Substantial quantities of pumice were washed up on the southern coasts of Australia. Particles varied in size, but were rarely greater than 1 foot in diameter.

"Dispersal of Pumice, Supposedly from the 1962 South Sandwich Islands Eruption, on Southern Australian Shores," Nature, September 25, 1965, by F.L. Sutherland,

During 1964 considerable quantities of pumice were washed up on the southern coasts of Australia. The arrival of the pumice on the Tasmanian coast was recorded by me. It was suggested the pumice was a remnant of the large raft ejected from a submarine eruption near the South Sandwich Islands in March 1962

Fiji, 1979 and 1984

Pumice rafts drifted from eruptions around Tonga, and some were reportedly 30 kilometers wide.

Tofua Arc, Tonga, 2001-2002

Pumice sea rafts traveled more than 3000 kilometers westward, reaching eastern Australia within a year. The principle passengers were algae, goose barnacles, serpulid worms, calcareous algae, bryozoans, corals, oysters, and gastropods.

Home Reef, Tonga, 2006

A passing yacht reported streaks of light, porous stone floating in the water, and then had "sailed into a vast, many-miles-wide belt of densely packed pumice" before witnessing the birth of the ephemeral island Home Reef.

NASA Earth Observatory commentary,

.The emerging volcanic island is partially hidden by its own plume. Volcanic plumes often appear drab gray or beige compared to clouds, and plumes from the emerging island move away from it in different directions, one to the southeast, and some to the north. The bright white spot directly over the island may be cloud cover, or it could be steam resulting from volcanic emissions.



The raft of pumice appears to the northeast of the emerging island, and it actually connects, via a thin thread, to neighboring Late Island. The blue-green color of the water around the raft and the new island is probably fine sediment that is making the deep blue water more reflective. The pumice raft gained international attention when a news report from Tonga Online described the experience of a yacht crew that inadvertently encountered the pumice raft. The "sea of stone" clogged the yacht's engine-cooling system, forcing the vessel to turn back.



Alcatraz, San Francisco Bay, Classified Information

It comes as a surprise to geologists, but we've published information that Alcatraz, the prison rock in San Francisco Bay, is in fact a buoyant mass of pumice with a recent history of vagrancy. Our

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source is "Tactics Around Alcatraz" Bay & Delta Yachtsman, April 1995, by yachtsman Gary Mull, reprinted from an article five years earlier. The story's worth quoting in its entirety, but we've pruned a few portions to move it along.

In the early 1700s, when the Spanish first began exploring what is now Northern California, they came upon San Francisco Bay and were stunned by its beauty and obvious advantages as a safe harbor as tourists are still stunned today. That it would make a fabulous harbor for a settlement was clear even at first glance. A small Spanish settlement was begun, and western civilization had come to San Francisco Bay.

A large promontory in the area that is now Baker Beach was selected as the best place to build a fort to protect the entrance to the Bay.

It was in the great storm of 1772 that the Spanish discovered that the promontory on which they had built their fort was not attached to the mainland, but actually seemed to be what is called now in geological circles a floating island. In fact, they had built their fort on what apparently was a large pumice plug, blown loose at some time from a volcano in some gigantic eruption.

The waves washed what we now call Alcatraz Island off the beach and moved it farther east, even closer to the Bay entrance.

Luckily, for some reason, it seems fairly stable in its present "upright" position, and the Spanish fort was not damaged, although the garrison was pretty shaken psychologically to find themselves winding up six miles further east at the end of the storm.

The Spanish fort and garrison stayed in that location for a long while, as can be seen in the very well-known mural at Mission Isabella which shows the fort in that location and, of course, shows no island where we now have Alcatraz.

It was in the mid-1800s when California became a state that the U.S. federal government decided to move the fort and garrison from China Beach further into the Bay to what is now called Fort Point.

The fort was rebuilt and expanded, I think, in about 1865 or so, at which time the old fort was completely torn down to make way for the new one. The U.S. Army took advantage of an extremely high tide and decided to move the fort even further into the Bay and anchored it offshore. It served as a perfect blocking fort for the San Francisco Bay entrance, but as there became less and less need for a fort, it was moved to its present location, using the original Spanish anchor chains and anchors to secure it. The link will soon be on display next to the section of cable from the Golden Gate Bridge in the San Francisco Golden Gate Bridge museum.

Though Alcatraz was no longer used by the Federal Bureau of Corrections, they still had a secrecy blanket on the fact that the basic constituent of the island was pumice. The reason for this, of course, is that they thought they might very well need the prison later on and didn't want this fact to be known. Frank Morris, the con who escaped from the island apparently had done his homework, and in the movie where you see him digging through supposedly rotting concrete, in fact he actually dug through pumice, which is quite soft. The Hollywood filmmakers had to rewrite those details to keep the secret.

Apparently what had tipped Morris on to the idea was that he had noticed from his cell window that, on a strong ebb tide in the spring when there was a lot of water flowing down from the rivers to augment the ebb tide, the island seemed much closer to San Francisco than usual.

He made a very crude surveyor's instrument which he could use from his cell window, and determined that during certain combinations of ebb tide and river flow, the island actually moved nearly 160 yards closer to the San Francisco shore.

This attempted escape gave the prison authorities serious worries and led them to request that the Army Corps of Engineers do a more careful survey of the area around Alcatraz in which

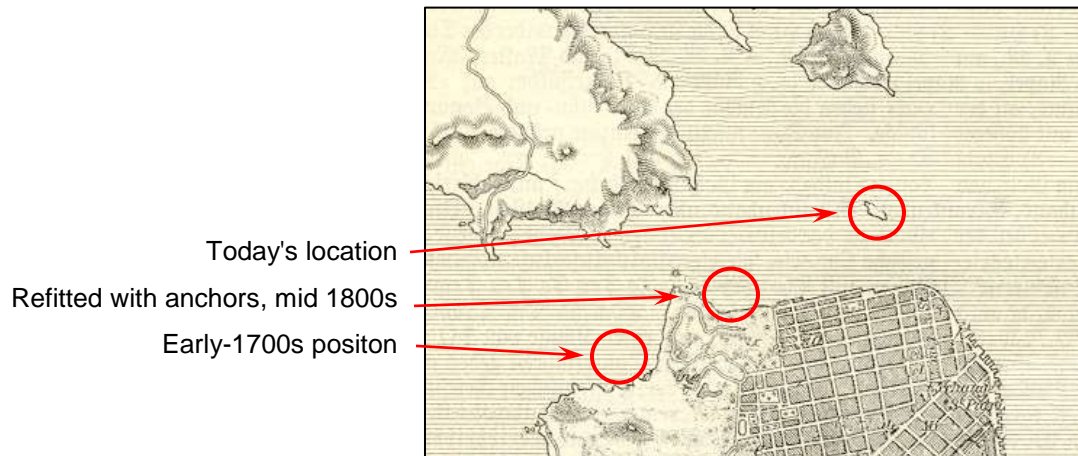
they found that one of the old Spanish anchors had dragged considerably. The drift, together with the wearing between the links, had added this approximately 200-yard slack in the anchoring system. It is not known for certain, but there was some suspicion that the anchor chain might very well have been snagged by a Japanese midget submarine, however, that is a totally unsubstantiated rumor.

As is usual with anything federal, the original budget for replacing the anchoring array with more modern equipment began at an estimated cost of \$32 million, and wound up costing you and me, the taxpayers, nearly \$182 million, including the casting of four stainless steel anchors, each weighing about 26 tons, and connected to the island with stainless steel cables and a rather sophisticated water cylinder damping system.

The future of Alcatraz is somewhat uncertain. Although not made broadly public, there was apparently some talk a few years back about moving Alcatraz once again, either somewhere into the South Bay or perhaps up in the shoals near San Rafael, or even as far up as Carquinez to serve as a place on which the federal or state government, it was never clear which, would build low-cost housing.

Unfortunately, as it turned out, owing to the silting upon the Bay from soils carried down from the rivers, Alcatraz seems to be firmly aground at present and the next tide high enough to float it once again will come in the year 2014.

By that time, it is hoped that we will have found some other way to deal with the problems of the homeless and the need for low-cost housing, but it certainly would be grand to see the Bay once again open as it was when the Spanish explorers first came here.



At least that's Mull's story, and there's a way to test it in nearby Sausalito. We'll consider what the results might be in Chapter 76

Jebel al Tair, Red Sea, 2007

Ash and pumice rafts resulted from the eruption of Jebel al Tair. One of these rafts can be seen in this photo with the USS Bainbridge in the background



Havre Seamount, New Zealand, 2012

The 2012 eruption of the submarine Havre caldera volcano on July 17, 2012 formed a pumice raft of coarse clasts, mostly 5 to 15 centimeters in diameter; When surveyed on August 10, the raft's maximum thickness was approximately 60 centimeters and it was spread over 200 square kilometers. The raft volume was 0.18-0.26 cubic kilometers, its equivalent amount of dense rock being approximately a third of that.

According to Lt. Tim Oscar of the Royal Australian Navy.

The lookout reported a shadow on the ocean ahead of us so I ordered the ship's spotlight to be trained on the area... As far ahead as I could observe was a raft of pumice moving up and down with the swell.

The rock looked to be sitting two feet above the surface of the waves, and lit up a brilliant white color in the spotlight. It looked exactly like the edge of an ice shelf,"

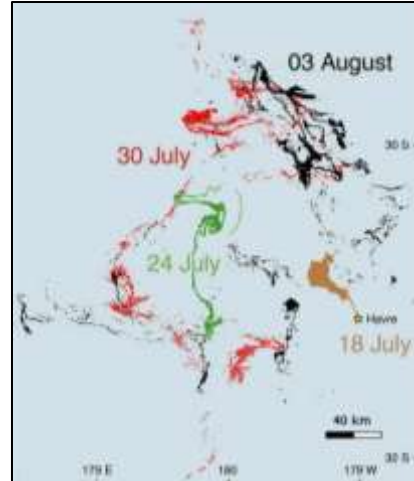
I knew the pumice was lightweight and posed no danger to the ship. Nonetheless it was quite daunting to be moving toward it at 14 knots... As we moved through the raft of pumice, we used the spotlights to try and find the edge -- but it extended as far as we could see.



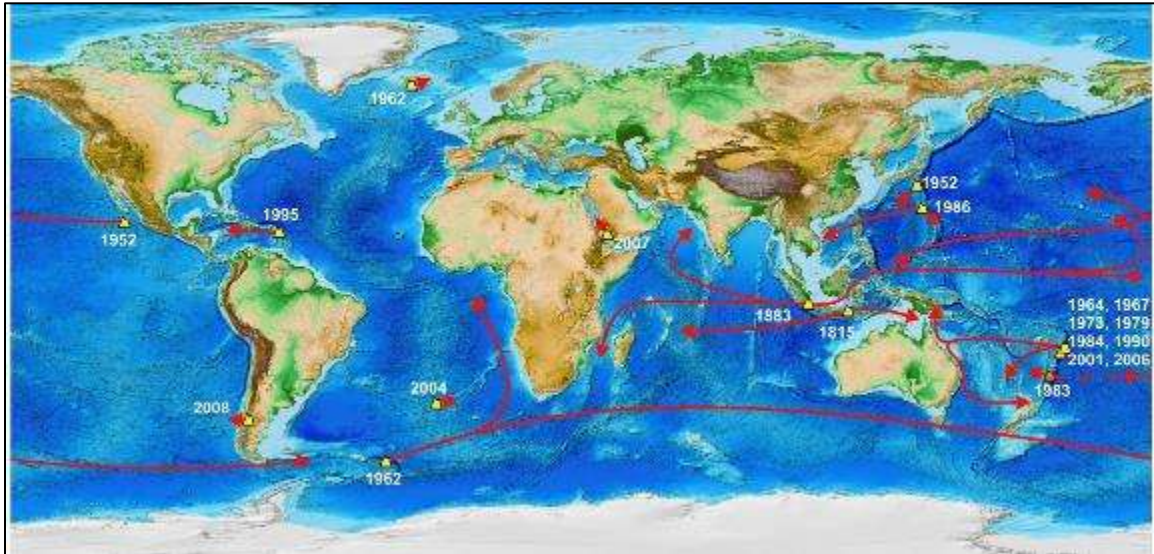
In 3 months of drifting, the raft affected 4.55 million square kilometers of ocean, more than twice the size of New Zealand. Over the next months, the raft drifted at 0.02-0.19 meters/second, separating into meter-to-kilometer-long single-clast-thick ribbons.

Motion of pumice rafts in the first 3 weeks after the eruption.

Within 8 months, some of the clasts had travelled 5,000 kilometers. Some remained afloat for almost two years.



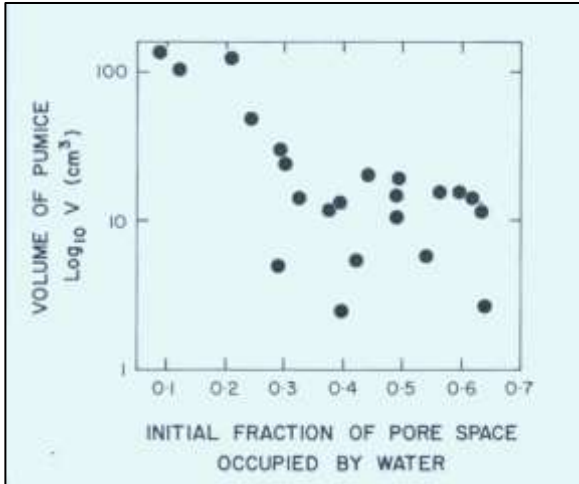
Significant Pumice Raft Events over the Last 200 Years



By the count of "Pumice Rafting and Faunal Dispersion during 2001-2002 in the Southwest Pacific," Earth and Planetary Science Letters 227 (2004) by Scott Bryan et. al., there's been about one event per decade.

A Bit of the Science

"Pumice," Bulletin of Volcanology 48.4 (1986), by A.G. Whitham and R.S.J. Sparks, reports that cold pumice floating on water slowly absorbs water into the vesicles and eventually sinks, though some pumice can remain afloat for over 11 years. The time taken for enough water to be adsorbed to sink depends on the pumice size, initial density, size distribution of vesicles and connectedness of the vesicles.

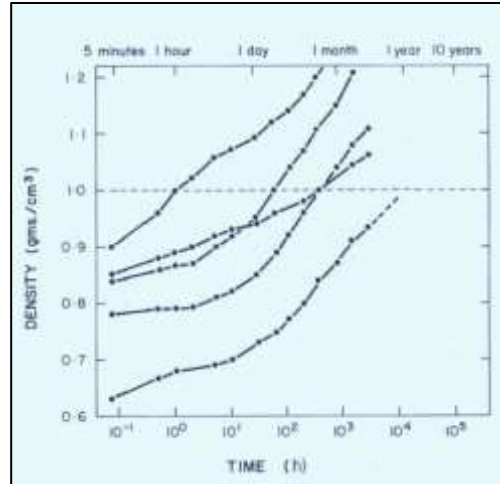


Initial fraction of pore space occupied by water vs. volume of clast.

Larger clasts tend to be initially more dry.

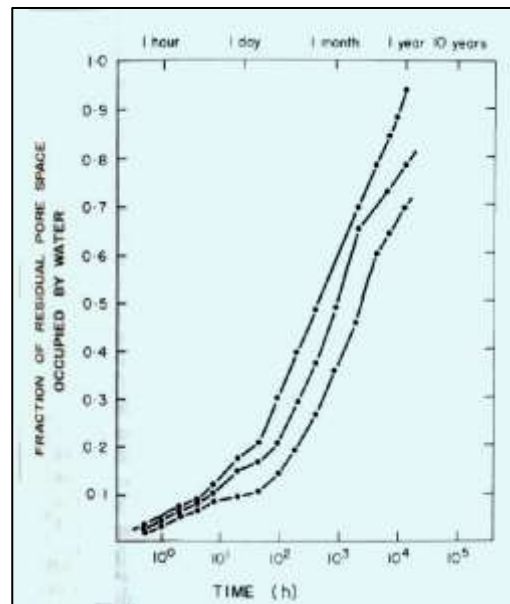
Fraction of pore space occupied by water after 5-minute immersion vs. time. Sample volumes are 2.6, 11.4 and 112 cubic centimeters, left to right.

Larger clasts absorb water more slowly.



Effective density of floating pumice vs. time. Clast size increases from left to right.

Larger clasts float longer



Possible Anthropological Mis-implications

Sea-borne pumice can transport other minerals, ones that might otherwise lead anthropologists to erroneously see evidence of trade.

A 32 by 22 by 20-centimeter piece of pumice that drifted to Nadikdik Atoll, Marshall Islands, had a 22 by 15 by 4 chunk of flakeable obsidian attached. Obsidian, volcanic or sedimentary rocks other than coral limestone or beach rock are not accessible at or near the surface of any of the Marshall Islands. As the atoll had been devastated by a typhoon and associated storm surge in 1905, the piece must have arrived by sea within the last 90 years.

There have been similar findings elsewhere

Koilo Island, Papua New Guinea -- a 1-centimeter glassy band attached to a 25-centimeter lump of pumice

Bikini Atoll, Marshall Islands, -- fragments of volcanic glass attached to floating pumice

Cocos-Keeling atoll -- a large piece of a volcanic bomb with a solid outer crust washed ashore

Such discoveries prompted Dirk Spennemann and Wal Ambrose to urge caution in presuming that obsidian artifacts found in archeological excavations are proof of trade relationships. From "Floating Obsidian and its Implications for the Interpretation of Pacific Prehistory." Antiquity 71:271 (1997),

A large piece of obsidian was found on Aelon-kan Islet, Nadikdik, in the Ratak Chain of the Marshall Islands. This is a significant finding since obsidian is not accessible at or near the surface of any of the Marshall Islands. Other similar raw materials had been distributed by ocean drift so human transport should not be the only explanation for the occurrence of obsidian in unlikely places. Therefore, claims of human-induced trade based on sourced raw materials should be avoided in the absence of further evidence.

Lava

In evaluating a floating-island tale which might involve lava, it's always well to review the geology. According to the Guta Saga (13th century), the Swedish island of Gotland originally sank by day and rose to the surface of at night, but after Tjelvar brought fire to the island, it never again submerged. As the modern island's geology is sedimentary, the lore can't be explained by volcanism.

Volcanism does play a role in selected locations, however.

"Kilauea after the Eruption of March, 1886," American Journal Of Science (1887), by W.D. Alexander, describes a Hawaiian observation

Near the south western portion of the pit lay the huge hulk of the now stranded "Floating Island," a great mass of firmly cohering rock which, for more than four years previous to the sinking of the lake, had been floating like an iceberg and slowly changing its position on the molten flood. It now towered, over sixty feet above its base on the bottom of the abyss and extended, I should judge, full a hundred feet in length.

"Island Sinks in Sea of Lava: Phenomenon in Honolulu Witnessed by F.A. Perret and Assistants," New York Times, September 17, 1911, describes another Hawaiian event.

One of the most extraordinary and amazing phenomena ever observed within the boiling lava pit of Halemaumau was watched by Frank A. Perret, the scientist, and his Japanese assistants on the night of Thursday last. On Monday, Aug. 14, the floating island which had been a feature for some months began to disappear, and on the evening of Thursday it had been eaten up by the heat of the surrounding liquid lava until the surface cracked into lines of fire. Then it sank, and in its place on the fire lake grew a gigantic bubble of lava-glass which stretched and bulged until it covered a section of the lake of over 3,000 square feet. This huge black bubble-propelled by a fire fountain, then navigated the length of the great lava sea, eventually glowing into a huge incandescent globe with the fires of Old Faithful and a sister fountain fire that burst forth beneath the blown-lava cupola.

"The Floating Islands of Halemaumau," American Journal Of Science (1911), by Frank Perret, describes the event in greater detail.

The view of the crater of Halemaumau -- impressive always in its suggestion of potential, if not manifested, power -- acquires, at times, a quality of extreme picturesqueness from the presence of an island, floating tranquilly and apparently unharmed, on the seething bosom of the glowing lava lake.

Halemaumau Lava Lake with Floating Island. July 1911



The formation of these islands may occur in various ways. It not infrequently happens that, amid the swirling eddies of the surface lava, a certain area -- balanced between opposing forces -- remains, for a considerable time, at rest. There results the formation of a crust which gradually thickens by accretion from below and may also be built up by overflow movements of the surface material or by the splatterings from some neighboring fountain, until a true island is formed which may move about upon the lake under the influence of a changing surface current.

Mr. L.A. Thurston -- an enthusiastic and indefatigable local observer, to whom the present writer is indebted for a mass of information and for innumerable courtesies -- in his vivid description of the great subsidence in July, 1894, wrote as follows:

"Most of the falling rocks were immediately swallowed up by the lake, but when one of the great downfalls referred to occurred. it would not immediately sink, but would float off across the lake, a great floating island of rock."

A number of causes may combine to bring about the initial flotation, and some of these will be effective in refloating the mass if submergence has taken place.

The rock may also enter the lake at the place of a rising lava current which will tend to buoy it up while, being cold and of sufficient mass to retain its temperature for a time, the lake material at once consolidates about it and forms a casing and a fringe which are comparatively light and under which the gases, constantly rising through the liquid, may accumulate and lend buoyancy to the whole.

The prism of rock undoubtedly extends to a considerable distance below the surface, where the temperature and the chemical activity of the lava are much greater, and there the contact surfaces must be slowly eaten away. This action will be accelerated if, as frequently occurs, the mass of the island intercepts a path of upstreaming bubbles of juvenile gas whose temperature and chemical activity are very high and whose mechanical and fountain-forming powers as well will be directed against the opposing rock.

It might certainly be supposed that a solid mass in free flotation would be raised and lowered with the rise and fall of the level of the liquid in which it is suspended, yet such is not the case here... The reason for this is that these rapid alternations in the level of the lake are due to a greater or lesser supply of gas -- or of gas-charged lava -- from below causing the surface to rise very much after the manner of boiling molasses. The lava at a certain distance below the surface, and in which the bulk of the island is presumably suspended, is not much affected and the island remains stationary while the rising surface emulsion overflows its shore, where upon it sinks to some extent.

A report in the Honolulu Commercial Advertiser provides more speculation.

In a momentary clearing away of the smoke, an extraordinary object was seen, floating far out in the center of the lake. A huge, sausage-shaped, gas inflated balloon of black lava-glass -- triangular or box-shaped at one end and cylindrical at the other -- was making its way across the lake. A lava fountain, boiling continuously under the eastern end, gave the appearance of a screw propeller, and this most amazing contrivance seemed to be navigating the lake under its own power like a great whaleback steamer, or a black Zeppelin airship. Its length was not less than 170 feet and the cylindrical portion about 30 feet in diameter. After nearing the western bank it was driven back by a current and returned toward the station.

The entire structure soon collapsed and sank out of sight beneath the now unbroken surface of the fiery lake.

I have no doubt that the explanation of this phenomenon is as follows: The island was kept from sinking by the large, flat area of black crust and, on the breaking up of this, it began to sink. In so doing, a quantity of gas was evolved when the hot lava covered the rock and this blew the great cylindrical bubble which then continued to support the island, although below the surface, for the final tour of the lake.

"Entombed in a Crater," Bucks County Gazette, April 10, 1890, is most likely set in what's now Malpais National Monument in New Mexico. The cave floor collapsed and the explorers landed on an island of volcanic rock floating on an underground lake;

J.A. Beaton and R.W. Loudon, of Albuquerque, while on their way to the Malpais, met a Mexican who volunteered for a few dollars to go and show them what he knew about the crater. As a general thing, Mexicans are superstitious and shun the vicinity of the lava beds, but this man agreed to go. He piloted the Albuquerqueans to a cave on the highest point, through cracks in the floor of which a warm vapor ascended. Viewing the surroundings for a few seconds, the men were startled by a low rumbling sound like distant thunder, and the lava beneath their feet trembled.

The Mexican had immediately to the open air, but before the gentlemen could realize it, a portion ' of the bottom of the cave fell, and they with it, into intense darkness. Neither was injured, but the ground upon which they fell seemed to sway to and fro. Fortunately one of the party had a candle and some matches, and after innumerable attempt to light it, the candle was made to burn.*

When the light was obtained a lake of water, black as pitch, lay at their feet, while the opposite shore appeared to be moving from right to left. It seemed that they had landed on a floating island or a huge mass of lava, which has probably been eddying around in this strange whirlpool for centuries. The Mexican soon returned to the mouth of the cave, and, lowering lariats, by the aid of their horses pulled the imprisoned explorers out of their bondage and to the surface once more.

While the sequence might seem to geological explicable, the lake's not been seen since, and thus we expect that the Gazette, a Pennsylvania paper, got duped.

Floating Sand

Less dramatic than rafts of pumice are reports of floating sand in quieter waters. By no means do the sands constitute an island on which a person could stand, and thus fall outside of our definition of floating islands, but they merit discussion.

As long as the surface of a sand grain is protected from wetting by an adsorbed air film, surface tension may sufficient for the grain to float. When the adsorbed air film is displaced by water, the grams the grain will sink. As water has a greater attraction for many common minerals than it does to air, the water eventually win.

Well washed, clean sands will float more readily than dusty sands. Gentle launching is important. Grain is less important, except in the case of large grains. Floating sand occurs in patches up to a foot or so in diameter,

The topic engendered lively discussion -- lively in context of scientific journals, at least -- at the turn of the century.

"Floating Sand: An Unusual Mode of River Transportation," American Geologist. 17 (1896), by Frederic Simonds, reported on floating particle in the Llano River near Bessemer, Texas, and experimental results from Long Island, Lake Michigan, Alum Bay, Isle of Wight, and Pea Ridge, Arkansas. Re-released in 1900, the conclusions, included,

1. *That sand grains will float in perfectly still water for an indefinite time.*
2. *That the grains which float are not necessarily siliceous. That flakes of mica, fragments of marble, bituminous shale, etc., also float and that some of them, the marble and the bituminous shale, for example, are unusually buoyant.*
3. *That the property of floating is not confined to the sand of any particular locality, but depends to a considerable extent upon the angularity, i.e., the shape of the grains.*
4. *That whether sand will float or not depends, also, upon the mode of launching. It must be gently done, for should the grains be plunged into the water with sufficient force to completely immerse them they will immediately sink.*
5. *That the natural conditions necessary to the floating of sand in rivers are somewhat unusual, depending, in the case of the Llano, upon a flood without local rains and, in that of the Connecticut, upon the manner in which certain waves strike a sand-bar.*

"Geological Phenomena resulting from the Surface Tension of Water," American Geologist, November 1898, by George E. Ladd,

It is not uncommon to see materials of a higher specific gravity than water floating upon its surface. The principle involved is again that of surface tension, and substances thus float only when the attraction for the water is less than the latter's surface tension.

Whenever, on the retreat of the tide, the beaches and the exposed bars are dried by the sun's heat, the returning water, if not too greatly disturbed by unfavorable winds, lifts, as it creeps up the slope, the whole superficial film of sand, including large thin pebbles of schist, and floats it gently on the surface. The surface of the water, near the shores bearing the sand, commonly moves out towards the main river, even when the tide is rising, the incoming water flowing beneath.

"Floating Stones," Nature, January 18, 1900, by Erland Nordenskiöld, relating to west Patagonia,

When the sea was calm or only agitated by a slight swell, small fragments of slate which floated upon the surface packed together in larger or smaller clusters. They drove hither and thither in the neighborhood of the shore, until they were driven away by the strong current which at intervals swept forward in the channel. The quantity was considerable; for instance, 700 of them were obtained at one cast of the net in a few minutes. The stones had evidently drifted out from the beach, which consisted mainly of similar stone fragments washed off from the cliffs composed of a bituminous mesozoic slate. The surface of the stones was dry, and they sank immediately when it became wet by touching or by the movement of the swell.

On examining the floating stones one could discern small gaseous bubbles attached to the under surface of them, and at the shore, stones can be seen on the very fringe of the beach which are just beginning to float lightened by gaseous bubbles.



"Floating Stones," Nature, February 1, 1900, Cecil Carus-Wilson and R.C.T. Evans

The grains float as patches composed of fine and coarse material clinging together; the presence of the very fine grains appears to facilitate the flotation of the larger grains and shells.

"Discussion and Correspondence, 'Floating Sand,' 'Floating Stones,'" Science 11:274, March 30, 1900, by Frederic Simonds, quotes from Henry Nichols of the Field Columbian Museum

At Cohasset, Mass., a town about twenty-five miles south of Boston, there is a land locked inlet from the sea, known as Little Harbor. There are here and there along its shores, small beaches of angular gravel and sand. When there is no wind, the tide rises gently on these beaches without even a ripple, and gently lifts grains of dry sand which form such patches as you describe a foot or more in diameter. Some days such floating patches are very numerous, and may be seen going out with the tide all the way from the head of the Harbor to the outlet over a mile distant. The rock of the region is granite and the sand is probably derived from it. The grains are very angular.

Without thinking much upon the subject, I have always considered that a film of air adhered to the grains and kept them from wetting, and that the floating was due to surface tension as in the case of the familiar experiment with a needle.

Largest Floating Particles

Dimension (mm)	Location	Reference
5 x 3.5 x 2.	Llano River, Bessemer, Texas	"Floating Sand: An Unusual Mode of River Transportation," <u>American Geologist</u> . 17 (1896), by Frederic Simonds,
15 x 7.5	Kimmeridge, Great Britain	"Discussion and Correspondence, 'Floating Sand,' 'Floating Stones,'" <u>Science</u> 11:274, March 30, 1900, by Frederic Simonds
5 or 6	Yellowstone Lake, Wyoming	"Floating Sand and Stones," <u>Science</u> , June 8, 1900, by E.O. Hovey,
9.5 x 6 x 2	Barrow, Alaska	"Floating Sand and Pebbles near Barrow, Alaska," <u>Journal of Sedimentary Petrology</u> 34:3 (1964), by James Hume

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From the latter,

Sediment floated in patches or rafts which varied in size from one grain up to 180 square centimeters (30 square inches). The patches were irregular in shape and were one pebble thick except for some slight overlap. The patches grew by joining one another. The movement of the patches accelerated just prior to contact. Impact was sufficient to sink a few grains. A clearly visible depression occurred around the patches regardless of the size and suggested a surface tension phenomenon.



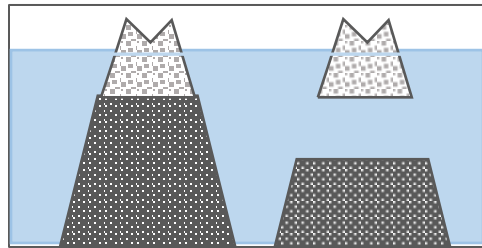
Floating Mountaintops

In the fictional The Pacha of Many Tales (1904), Frederick Marryat presents a novel theory of oceanic volcanism.

“As for its name, we call it Whale Island,” replied the man; “but as for where we are, we cannot exactly tell ourselves, for we are a floating island, being composed entirely of pumice-stone, whose specific gravity, as you must know, is much lighter than that of water.”

“How strange,” observed I; “I cannot believe that you are in earnest.”

“And yet not quite so strange as you imagine,” replied my conductor. “If you examine the structure of this island, from where you now stand, you will perceive at once, that it has been the crater of some large volcano. It is easy to imagine, that after having reared its head above the surface of the sea, by some of those sudden caprices of ever-working nature, the base has again sunk down, leaving the summit of the crater floating on the ocean.



Such is our opinion of the formation of this island; and I doubt whether your geologists on the continent would produce a more satisfactory theory.”

As we said, it's fictional.

Calcium Carbonate

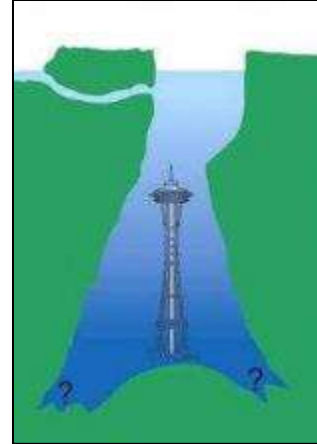
As calcium carbonate is the basis of many rocks, we'll include it here, though our example would rarely be thought of as one about a rock.

The karst sinkhole El Zacaton in northeastern Mexico is 339 meter deep, roughly 100 meters in diameter, 1 to 1.5 meters thick and is surrounded by 20-meter cliffs. The waters are warm (28 to 33 degrees C) and highly mineralized, smelling strongly of sulfur.

The waterbody contains 15 grass-covered floating islands, "zacate" meaning "grass," in this case, *Cladium californicum*. Absent any current, the islands are propelled by the wind.

A small number of shrubs and cacti also grow on the islands and the islands are inhabited by turtles and snakes.

Seattle's Space Needle for comparison

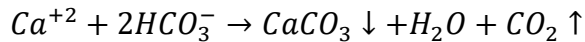


The first written report of the formation comes from Félix María Calleja, viceroy of New Spain, Informe Sobre la Colonia del Nuevo Santander y Nuevo Reino de León (1795).

There is a large cave lit by natural skylight; and 200 varas from this cave there is a deep cavity that has a lake with an island.

The genesis of these islands remains somewhat of a mystery. There are no shelves near the water surface from which a colony of grass might dislodge and float. There are no shallow underwater shelves upon which humus might accumulate and be floated by decompositional gasses.

Over time, travertine (calcium carbonate) may have precipitated to form a buoyant membrane.



In normal circumstances, the calcium carbonate settles, but in exceptionally quiescent conditions, carbon dioxide entrained in the precipitate might form a buoyant scum.

Chapters 32 and 54 describe sinkhole floating islands in Italy and Florida, and to these we can add two in South Africa.

"Bottomless Holes," Sausalito News, November 11, 1899, dolomite sinkholes near the Malmani Goldfields in the Transvaal,

There is another, somewhat larger... full of water almost up to the brim, and it has upon it a floating island of grass which shifts from side to side with every change of the wind. To find further examples of the same sort of herbage, it is necessary to go 600 miles northward, well into the hot districts in the tropics.

Seven Years in South Africa: Travels, Researches, and Hunting Adventures, between the Diamond-Fields and the Zambesi (1872-79) (1881), Emil Holub, near Mamusa, North West Province.

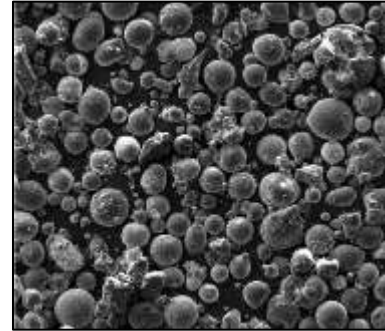
A spring that I saw in the neighborhood was issuing from one of the deep cavities in the hard limestone, and at no great distance from this I noticed a small rock-pool, on the surface of which was a little floating island of grass.

Fly Ash

Fly ash is a waste product of coal-fired power stations. Settling in an engineered sedimentation pond tends to remove 99 percent of the product. The ponds are drained and the material is landfilled.

The remaining one percent or so of the fuel ash are cenospheres, light-weight, rigid, waterproof, inert, hollow spheres filled with air or gas. The color of cenospheres varies from gray to almost white.

Scanning electron microphotograph. The larger particles have a diameter of about 60 micrometers.



Cenospheres form floating islands tens or meters in diameter on the surface of the disposal pond, which in turn collect organic material sufficient to be colonized by such flora as *Glyceria fluitans*, *Ranunculus aquatilis*, *Phragmites australis*, and *Typha latifolia*. Left undisturbed, fly ash islands can sport have willow and birch trees.



Are There Floating Bricks in Spain?

Early authorities thought so.

Architecture (15 BC), by Vitruvius,

The bricks of Calentum in Spain, Marseilles in France, and Pitane in Asia, are, when wrought and dried, specifically lighter than water, and hence swim thereon. This must arise from the porosity of the earth whereof they are made; the air contained in the pores, to which the water cannot penetrate, giving them a buoyant property. Earth of this sort being, therefore, of such a light and thin quality, and impervious to water, be a lump thereof of whatever size, it swims naturally like pumice-stone

Naturalis Historia (c. 77-19 AD), by Pliny the Elder,

In the cities of Maxilua and Calentum in Farther Spain, there are bricks made, which float in water, when dry; the material being a sort of pumice-earth, extremely good for the purpose when it can be made to unite

Geography (c. 7-18 AD), by Strabo,

In Pitane there is also a place on the sea called "Atameus below Pitane," opposite the island called Eleussa. It is said that in Pitane bricks float on water, as is also the case with a certain earth [or "rotten stone"] in Tyrrhenia, for the earth is lighter than an equal bulk of water, so that it floats. And Poseidonius says that in Iberia he saw bricks molded from a clay-like earth, with which silver is cleaned, and that they floated on water.

As best we know, however, Posidonius (c. 135-51 BC), to whom Strabo refers and whose works now exist only in fragments, likely never visited the site, That no one has reported such bricks in the intervening two millennia suggests that the reports, esteemed as is their authorship, may have been hearsay.

On the other hand, there could have been physical basis for the reports. Di Una Singolarissima Specie di Mattoni (1797), by Adamo Fabbroni, suggests that the bricks to which Posidonius referred might be a mixture of the earth in northern Morocco called "lac lunae," fossil meal, mineral agaric and guhr.

"Bricks that Swim on Water," Annals of Philosophy 4. October 1814, addresses the same question.

The ancients possessed the art of making bricks that swam on water. Pliny names Pitane, an Asiatic town, and Calentum and Mazilua in Spain as places where the materials of these bricks are found. Fabbroni some years ago discovered a substance from which similar bricks might be made. It occurs at Castel del Piano near Santa Fiora, between Tuscany and the States of the Church... Klaproth has lately analyzed it, and found it composed of

Silica	79
Alumina	5
Oxide of iron	3
Water	12
Loss	<u>1</u>
	100

So that it nearly agrees with a mineral previously analyzed by him to which he gave the name "kieselguhr."

A brick light enough to float, however, would not lend itself to durable structures, and thus not likely have to have been produced..

Might a brick float?

Yes, according to two dated articles, though the recipes need refinement.

Did such bricks ever float in Spain?

We suspect not.

Floating rocks, it seems, inspire their own folklore, as noted by James Frazer in The Golden Bough: A Study in Comparative Religion (1890). In a modern Roman version of "Aladdin and the Wonderful Lamp," -- Frazer doesn't provide further citation -- the magician holds the princess captive in a floating rock in mid-ocean that he will never die. To rescue her, the prince secures the required magic gem.



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CHAPTER 31

GET RICH



How to get rich on a floating island, or at least recognize the opportunity; that's what this chapter is about.

Gold

To begin, gold is heavy.

Substance	Density, (pounds/cubic foot)
Platinum	1330
Gold	1200
Mercury	800
Lead	700
Silver	650
Copper	560
Iron	450
Diamond	220
Water	62

Based on Chapter 19, the physics of buoyancy, an effective way to sink a floating island would be to pile it with gold. It thus comes as little surprise that the stories about gold-laden floating islands are fictional. Here are two.

"Mysterious Cruise of the Sutherland. Search for Hidden Treasure," Philadelphia Inquirer, November 12. 1899,

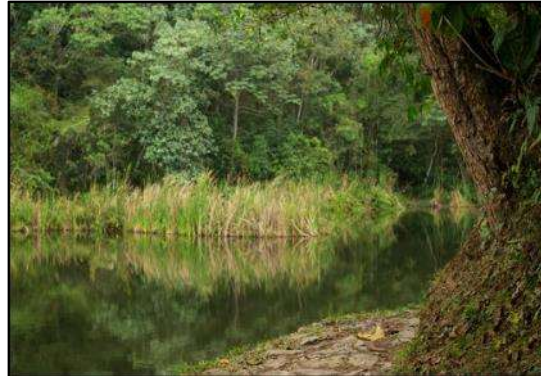
A letter just received at San Francisco from El Triunfo, San Salvador, tells of the mysterious actions of the three-masted schooner Sophie Sutherland, which, it believed, is searching for buried gold or hidden wealth of some description off the Central American coast. The letter, which is from Captain James Wilson, of El Triunfo, states that the schooner appeared off the coast about three weeks ago. Captain Wilson says it is probable she is trying to locate some little island off the coast where it is said considerable treasure was buried.

This is not the first time the Sophie Sutherland has engaged in expeditions of this kind. About eight months ago Louis Weule and several others bought the schooner and equipped her for a long cruise. The greatest secrecy was maintained and it was not until long after she had sailed that it was learned that she had gone to search for a floating island which, according to the story, literally teemed with gold.

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This island is supposed to be located in the vicinity of the Solomon group and the owners of this schooner hoped their vessel would return loaded down with gold. The schooner was gone for several months and then turned up at Samoa. The captain and crew had given up the search for the phantom isle of gold which floated away before the Sutherland arrived.

The floating island of Laguna del Tabacal, La Vegais, Columbia, is the mistress of the landscape -- a queen comprised of junca reeds and native trees. In the morning, she awakens in the middle of the lagoon, floats to the left in the afternoon and the opposite end at night.



Many wonders are told of the lagoon, the first, one that involves gold.

The chieftain Panche once performed rites on the nearby Butulú hill, which is attached to the lagoon by a golden bar.

The god Cacique threw gold to the lagoon and his enemies were dragged down by the spirits of the past Caciques

The lagoon has no bottom, or perhaps is shaped like a funnel.

The lagoon has two springs, one cold and one warm, made the god Mohan.

The people dug a 60-meter hole for the gods' daily bath. The waters are taken in winter and summer, which is why there are cold and warm currents.

A meteorite, falling like lightning and full of fire, formed the lake.

A woman who bathes in the pond recovers her virginity, but no one is allowed to do so, as the temperature difference causes too much shock to the body.

No one has stepped on the island, because of a species of ant whose bite can kill.

Copper

Though less dense than gold, copper is weighty enough to tax the buoyancy of a naturally-floating island. The Jesuit, Claude Dablon (Chapter 21), however, passes on an assertion to that effect in Relation Particulière de ce qui s'est Passé dans le Voyage des Pères de la Compagnie de Jésus en la Nouvelle-France (1668).

Mines of Copper which are Found on Lake Superior

The first place where copper occurs in abundance, after going above the Saut is on an island about forty or fifty leagues therefrom, near the north shore, opposite a place called Missipiconatong.

The savages say it is a floating island, which is sometimes far off and sometimes near, according as the winds move it, driving it sometimes one way and sometimes another. They add that a long time ago, four Indians accidentally went there, being lost in a fog, with which this island is almost always surrounded. It was long before they had any trade with the French, and they had no kettles or hatchets. Wishing to cook some food, they made use of their usual method, taking stones which they picked up on the shore, heating them in a fire, and throwing them into a bark trough full of water, in order to make it boil, and by this operation cook their meat. As they took up the stones, they found nearly all of them pure copper... Before leaving, they collected a quantity of these stones, both large and small ones, and even some sheets of copper.

Dablon's report was cited in Canadian mineral surveys though much of the 19th century, though usually only as an anthropological note. Copper was known to occur in the region, but not on floating land.

We must likewise question the accuracy of "Reminiscences of Early Days Mining Booms," Mohave County Miner and Our Mineral Wealth, October 11, 1921.

The Jumbo mine brought Charles D. Taylor a check for an even million dollars from George Wingfield and Senator Nixon, who later organized the Goldfield Consolidated, which with their other holdings made them multi-millionaires. Taylor today, it is claimed, owns "a well-stocked" floating island somewhere in the Pacific, off the British Columbia coast. He named it "Jumbo Island."

Taylor's bonanza Jumbo Mine was in Goldfield Nevada. There was, however, another Jumbo Mine, this one for copper and less lucrative, on Prince of Wales Island, Alaska, just above the British Columbia line, owned by others. Jumbo Island, near the mine dock, was (and is) undeveloped, of igneous origin, and without any hint of flotation.



News accounts of the era were liberal with "it is claimed" citations. As to how this particular claim came to be, one that switches between Jumbos and floats one for good measure, we'll never know.

Bronze

For bronze, we return to Homer's Odyssey.

Next we reached Aeolia, a floating island, where Aeolus lived, son of Hippotas, whom immortal gods hold dear. Around it, runs an impenetrable wall of bronze, and cliffs rise up in a sheer face of rock.

The Queen of the Air: Being a Study of the Greek Myths of Cloud and Storm (1869) John Ruskin

Now, you are to note first, in this description, the wall of brass and the sheer rock. You will find, throughout the fables of the tempest-group, that the brazen wall and the precipice (occurring in another myth as the brazen tower of Danae) are always connected with the idea of the towering cloud lighted by the sun, here truly described as a floating island.

D.E.W. Wormell, "Walls of Brass in Literature," Hermathena, November 1941

Homer, Hesiod, and Plato we are in the realms of fancy, and not far from fairyland. The writers are thinking in part of the indestructibility of bronze, from which traditionally the firmament of heaven and the threshold of hell were made. But they are thinking also of its magical potency, for bronze, like gold and iron, is closely associated with magical practices -- a fact which, perhaps, in part reflects the bewilderment felt by stone-age man in face of an enemy fighting with metal weapons. The magic of the bronze would enhance the magic of the circle made by the ring wall, and would constitute an impenetrable defense.

Diamonds

The Shi chou ki ("Records of Ten Insular Realms") is a fantastic description of foreign lands, attributed to the Taoist Tung-fang So, born in 168 BC.

On the Floating Island (Liu chou) which is situated in the Western Ocean is gathered a quantity of stones called kun-wu. When fused, this stone turns into iron, from which are made cutting-instruments brilliant and reflecting light like crystal, capable of cutting through objects of hard stone (jade) as though they were merely clayish earth.

Li Shi-chen, in his Pen ts'ao kang rnu quotes the same story in discussing the diamond, but according to "The Diamond: A Study in Chinese and Hellenistic Folk-Lore," Publications of the Field Museum of Natural History. Anthropological Series 15:1, 1915, by Berthold Laufer with an important variant -- The stones occur in the Floating Sand (Liu-sha) of the Western Ocean, not the Liu chou. Liu-sha mose likely refers to the Mediterranean;

As for actual association between diamonds and floating islands, we've the section ahead.

Marine Mining

A disclaimer: But for one exception, we'll see no reference to "floating island" in this section. Ships and barges are involved, to be sure, but not ones inflated to "island" magnitude. We are confident, however, that should marine mining continue to expand -- and dollars indeed speak in this direction -- it will be but a short time until the platforms on which the crew lives and the humungous machinery operates will engender "island" nomenclature.

For background, we quote "A Gold Rush in the Abyss," New York Times, July 9, 2012.

Scientists once thought the main source of wealth in the deep sea lay in beds of potato-size rocks that could be mined for such common metals as iron and nickel. In the 1960s and '70s, entrepreneurs tried to scoop them up, but the rewards never offset the high cost of exploration, retrieval and transportation.

Things began to change in 1979 with the discovery of "black smokers", sulfurous mounds and towers that gush blistering-hot water. The smokers turned out to dot the 46,000 miles of volcanic fissures that gird the global seabed like seams on a baseball.

The first wave of discovery showed that the volcanic springs harbored riots of bizarre creatures, including thickets of tube worms. The second wave showed that the mounds and chimneys — hot and cold, new and old, active and inactive — were composed of complex minerals that contained surprising amounts of copper, silver and gold.

Today, increasingly, mines on land lack rich supplies of copper, a staple of modern life found in everything from pipes to computers. Many commercial ores have concentrations of only a half a percent. But seabed explorers have found purities of 10 percent and higher — turning the obscure deposits into potential bonanzas. The same turned out to be true of silver and gold.

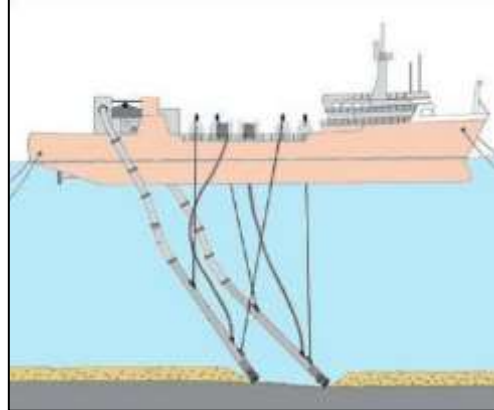
Craggy deposits of nodules resembling knobby black potatoes from a few centimeters to 30 centimeters in size, rich in gold and silver, copper and cobalt, lead and zinc, are strewn across the rolling carpet of sea-bed sediment.

Deposit	Average Depth (meters)	Resources
Polymetallic nodules	4,000 - 6,000	Nickel, copper, cobalt, and manganese
Manganese Crusts	800 - 2,400	Mainly cobalt, vanadium, molybdenum and platinum
Sulfides	1,400 - 3,700	Copper, lead, zinc, gold and silver

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Technologies appropriate for marine mining.

1. Continuous-line buckets operating as a conveyor-belt from the sea floor to the surface, where a mobile mining platform extracts the minerals and dumps the tailings into the ocean.
2. Hydraulic suction mining in which a pipe sucks nodules to the mining ship where the slurry is filtered and the tailings are returned to the seabed by another pipe. Diamonds are mined off the South African and Namibian coasts in this manner.



"Dredge and Hard Rock Mine at Dalton Mine, Nome, Alaska," publicity in search of financial backing, describes a scaled-down version, this one to haul up gold. Note the use of "floating island."

IPA Gold is seeking partners for the construction of the Flagship Ocean Gold Dredge, named "The Golden Boy I".

The Golden Boy I will boast three collection points which combined collect 360-450 yards of material per hour or, over 6 tons per minute. Collected material is then processed on board via a Reverse Helix Trommel system containing Proprietary Technologies exclusive to IPA Gold. When deployed, the Dredge is literally a floating island capable of housing a full crew for extended periods of time.

Yield projections for this craft is very difficult given the large amount(s) of new technologies being employed. Testing with a system less than the 1/4 the processing capability and lacking 80% of the penetration strength would suggest a minimum averaging of 2 ounces of gold per hour.

3. Remotely-operated submersible crawling machines. "De Beers' Big Green Machine Sucks up Namibian Diamonds," Reuters, June 18, 2014, describes one..

A bright green crawling machine that weighs 286 tons and stretches over three stories tall recovers diamonds by sucking up sand and silt 100 meters and deeper underwater.

Offshore diamond mining started in 1961 in less than 35 meters of ocean, but it has been only in the past decade that technology has allowed operations in deeper water.

The crawler uses a nozzle to slurp up tons of sediment an hour from ancient submerged beaches as it scours the ocean floor for diamonds carried from the Orange River to the Atlantic millions of years ago.

Each Debmarine Namibia ship, a self-contained floating mining operation, processes the debris, and helicopters then take the "concentrate" in jam-sized jars to land, where the diamonds are sorted by hand.

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"Nautilus Minerals Completes Second of Three Marine Mining Machines," Emerging Markets Business Information News, January 31, 2015, will use the crawler for metals.

Nautilus Minerals has completed the second of three machines it needs to mine high-grade poly-metallic seafloor massive sulfide deposits at 1600 meters below the surface of the Bismarck Sea, offshore Papua New Guinea.

The collecting machine... weighing 200 tons when fully assembled...was designed to collect material cut from the seafloor by drawing it in as seawater slurry with internal pumps and pushing it through a flexible pipe to the riser and lifting system and onto the support surface vessel.

The collecting machine, would collect the cut material by drawing it in as seawater slurry with internal pumps and pushing it through a flexible pipe to the subsea pump and on to the vessel via the riser and lifting system. The remaining water and rock would be sent back down another pipe nearly all the way back to the ocean floor.

In 2014 alone, companies from Brazil, Germany and the Cook Islands had permits to explore up to 75,000 square kilometers of ocean floor for copper, cobalt, nickel, manganese and rare earth metals. Operations are planned 30 kilometers off the coast Papua New Guinea where the gold content of the sulfide deposits averages 26 parts per million.

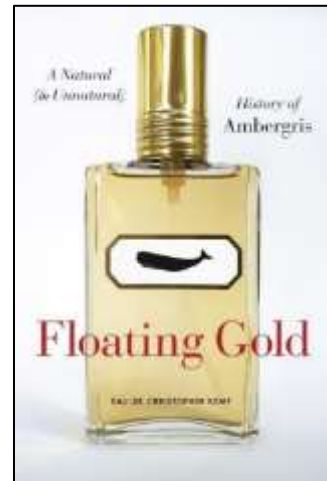
But as warned in "Marine Mining: Underwater Gold Rush Sparks Fears of Ocean Catastrophe," Observer, March 1, 2014, all may not be sit with the environment. Ship-board -- "on island," we might say -- concentration is necessary for economic viability and the experts are still working on how to better dispose of the waste.

Ambergris

Ambergris, a light-weight, rock-looking substance found floating at sea or washed up on beaches is a component of perfumes such as Chanel No. 5.

Cover of Floating Gold: A Natural (and Unnatural) History of Ambergris (2012), by Christopher Kemp

Ambergris is valued at roughly \$10,000/pound, about half the price of gold. As gold is roughly 20 times denser, however, it requires about 40 cubic centimeters of the ambergris to equal the value of one cubic centimeter of the yellow metal.



From where comes such a sea-borne treasure?

In The History of Japan (1690), Engelbert Kaempfer deems the substance to be,

A kind of bitumen generated in the bowels of the earth, or a subterraneous fat, grown to the consistence of bitumen, which is by subterraneous canals carried into the sea, and there undergoes farther digestion, being by the admixture of its saline particles, and the heat of the sun, changed into Ambergris.

The Royal Society, Philosophical Transactions and Collections, to the End of the Year 1700 (1734),

An ignorant Fellow in Jamaica, about two Years ago, found 150 Pound Weight of Ambergris dash'd on the shore, at a Place in these parts called Ambergris Point, where the Spaniards come usually once a Year to look for it. This vast Quantity was divided into two Parts; supposed

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by Puffing and Tumbling in the Sea. This Man tells me that 'tis produced from a Creature, as Honey or Silk. And I saw in sundry places of this Body, the Beaks, Wings, and part of the Body of the Creature, which I preserved some Time by me. He adds, that he has seen the Creatures alive, and believes they swarm as Bees, on the Sea shore, or in the Sea.

According to Caspar Neumann, in On Ambergris (1729),

Ambergris is an extraneous Substance that swims in the Sea, and is swallowed as a Delicacy by the Fishes, and voided by them again undigested. It seldom stays long enough, to be found in their Bodies.

The anonymously-written History of the Discovery and Conquest of the Canary Islands (1764) describes sandy bay on the island of Graciosa.

Here is sometimes found a very good kind of ambergris, in form something like a pear, having commonly a short stalk; by this it should seem that it grows on the rocks under-water, which are near to this place, and is washed ashore by the waves, for it is generally found after stormy weather.

Jean-Baptiste Denis, physician to Louis XIV, proposed that ambergris was a mixture of wax and honey that had melted in the sun, fallen into the sea, and transformed by seawater and the action of the waves.

Others claimed that ambergris to be "the dung of birds."

The real story: Ambergris is produced within the intestine of a sperm whale when an irritant such as the beak of a squid causes the pathological formation of a waxy encapsulant. When expelled from the whale, ambergris can float on the sea for years, where it hardens and develops its subtle odor.



To the left, a 926-pound boulder of ambergris from a whale harvested in the Antarctic in 1953. Pieces that are battered about in the open sea, however, are rarely greater than a few of tens of pounds.

As Herman Melville put it in Moby Dick (1851),

Who would think, then, that such fine ladies and gentlemen should regale themselves with an essence found in the inglorious bowels of a sick whale. Yet so it is.

Conclusion

Fortunes can be made from floating islands, but there are quicker ways to become rich.

CHAPTER 32

READ PLINY

Now stepping away from mythological tales of floating islands we transition into "factual" literature that may or may not be factual, but by virtue of its literary pedigree, cries to be justified. We'll consider the writings of what might be called the west's first systematic geographers, the Romans and their Latin legacy regarding floating islands in their own back yard.

The geography and geomorphology that once was may not be the geography and geomorphology of today. Place names alter. Once-floating islands may have incorporated themselves into lake banks; others may have disintegrated. As the Romans both drained and created lakes in the karstic region, what looks natural to day may be the result of engineering. Climate of land use change may have caused waterbodies to fill with sediment. Emergence and disappearance of floating islands for whatever reason is part of the ebb and flow of both natural and recorded history.

Athanasius Kircher's Mundus Subterraneus (1664) reads like the Book of Ecclesiastes on the matter.

Thus it is understandable that many of these islands once existed in the lakes mentioned above, but today do not exist; for they either coalesced with the shore, or sank through their increased weight. Also many floating islands are found today which were unknown to the ancient Romans, as I reported regarding Lake Albuleus. Thus nature plays a perpetual game of generation and corruption in this world, so that what ceases in one place, rises fresh in another, and that too will perish at its appointed time.

As geology and climate combine in the Italian Peninsula to produce an environment amenable to floating islands, Roman scholars dutifully recorded geographic particulars, some observed, but more typically, geography that was said to be.

We'll pull together writings pertaining to eight lakes having floating islands mentioned in classical writings

Lacus Fundanus	Pliny the Elder (23-79 AD)
Lacus Cutiliensis	Pliny the Elder
Lacus Mutinensis	Pliny the Elder
Lacus Statoniensis	Pliny the Elder
Lacus Tarquiniensis	Pliny the Elder,
Lydia Calaminae	Pliny the Elder
Lacus Vadimonis	Pliny the Elder and Pliny the Younger (61-114)
Lacus Albuleus	

All of the above have gone by other names over the intervening centuries, and some modern lakes vie for Latin heritage. With, we'll note alternative designations.

Pliny the Elder devoted a chapter of Natural History to "Of Islands Ever Floating and Swimming."

Certain Isles are always waving and never stand still, as in the country about Caecubum, Reate, Mutina and Statonia.

Lacus Fundanus (Fondi, Caecubum)

Lago di Fondi, Pliny's reference to Caecubum, today covers about 380 hectares with an average depth of 9 meters, although it is 30 meters deep in one part. The lake is known for its floating islands formed by ballene, root and reed fragments detached from the banks.



Lacus Cutiliensis (Rieti, Paterno)

Varro referred to Lacus Cutiliensis as the "Italiae umbilicus," the "bellybutton of Italy." It formed as a sinkhole and has a depth of approximately 150 meters.

Perhaps because of the lake's unique configuration, it attracted the attention early writers, several of whom confirmed the existence of a floating island.



1846



Today

Dionysius of Halicarnassus (60-7 BC), Roman Antiquities,

This island is about fifty feet in diameter and rises not more than a foot above the water; it is not fixed, and floats about in any direction, according to how the wind gently wafts it from one place to another. An herb grows on the island like the flowering rush and also certain small shrubs, a phenomenon which to those who are unacquainted with the works of Nature seems unaccountable and a marvel second to none.

Seneca (4-65),

For mine own part I myself have seen an island in the Lake of Cutilias that floated... The island of Cutiliensis has trees and shrubs growing on it, although the water bears it up, and it is driven hither and thither, not only by a strong wind, but by every gentle breeze. It does not remain in one place either day or night, as it is moved by every breath of wind.

Pliny the Elder (23-79),

Near the Lake of Cutiliensis there is a dark grove which is never seen in one place for a day and night together.

Ambrosius Macrobius, in his Saturnalia (early 5th century),

When the Pelasgians had been driven from their homeland, and after much wandering reached Latium, they observed a floating island in Lake Cutilia. It was a large expanse of turf, composed

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of dense mud or packed-together marsh, and was adorned with brushes and trees forming a dense wood, and the waves pushed it all about the lake, so as to give credence even to the account of Delos, which was held to have wandered the seas, even with its high mountains and vast plains.

Domenico Silvestri's De Insulis et Earum Proprietatibus (between 1385 and 1410) notes for "Cutilensis" that,

This lake, now called Montecchi, is located in the Reatine Plain. The island is more or less round, it is mobile, it has many large trees growing on it, and its diameter is said to be 24 yards.

Silvestri's dimension suggests factuality, but we cannot fail to note the "is said to be."

We cited George Sandys' 1632 commentary on Ovid's Metamorphosis in Chapter 1, but we'll repeat a portion of it here as it relates to Cutilia.

I myself have seen one (sayeth Seneca) in the Lake of Cutilia, adorned with trees and fruitful in pasture, carried hither and thither, not only by the wind but the air, insomuch as never constant to one station; proceeding from the gravity of the water and levity of the earth, though bearing trees, yet of no solidity. Created perhaps with the concretion of whatsoever floated on the Lake by the glutinous moisture; the stones porey, and not subject to sink, of the nature of Pumice.

The "sayeth Seneca" sayeth it all: 17th-century exposition based on first century fieldwork,

William Gell, in The Topography of Rome and its Vicinity (1834), remarks that the lake still existed, though reduced in size by the continual incrustation of its banks; the floating island has disappeared.

The lake, on the surface of which an island is said to have floated, is now called the Pozzo Ratignano, and is very remarkable for its clearness and great depth.

The phenomenon of the floating islands may still be observed; they are nothing more than reeds, or long coarse grass, the roots of which, bound together by the petrifying nature of the water, are sometimes detached from the shore.

The banks appear to be increasing and encroaching each other by incrustation; there is no shelving shore, the rock being suspended over the lake, like broken ice over a deep abyss.

We've perhaps a millennium and a half between the island's last first-hand documentation and the report from Gell. One could argue that the intervening writers had personally confirmed the floating island of which they wrote; one could argue that their wordings suggest hearsay.

In any case, as indicated by the three following excerpts, other than some buoyant vegetation, the island floats no more.

Richard Keppel's Excursions in the Abruzzi and Northern Provinces of Naples (1838),

The island is no longer visible, and it is to be observed that in another much smaller pond, situated on lower level on the left side of the road, two or three masses of a vegetable substance appear floating on its weed-covered surface, and are said by the country people to be put into motion when the wind is sufficiently strong.

Illustrated Excursions in Italy (1846) by Edward Lear,

The lake is a sheltered and rather cheerless oval of dark clear water; Paterno standing immediately above it, with all of its olive slopes reflected below... There is a second little lake close by with deep foliage-covered banks, but I could see nothing of either of the floating islands mentioned by the ancients.

The Cities and Cemeteries of Etruria (1848) by George Dennis commenting on Cutilia,

Masses of vegetable matter, floating on the water, assume the appearance of islands, and having had their cruise awhile, become entangled at length by some prominent rock or tree on

the shore, attach themselves permanently to it, and settle down into respectable portions of terra firma.

The Dictionary of Greek and Roman Geography (1854) edited by William Smith, states explicitly of the floating island of Cutilia os "subject of great exaggeration with many ancient writers":

Lacus Mutinensis

The Mutinensis is a marshy plain in Modena where floating islands might be anticipated. Pliny's reference, however, remains a mystery. Lago di Pratignano or Lago Scaffaiolo, near the source of the Panaro River, have been suggested, but neither is in the plain, Lago di Pratignano indeed has had a floating mat.

A comment in Travels Through Germany, Bohemia, Hungary, Switzerland, Italy, and Lorrain: Giving a True and Just Description of the Present State of Those Countries (1760) by Johann Keyssler puts it explicitly.

I must here observe that Pliny mentions a floating island in the Modenese, but at present no such phenomenon is to be seen in these parts

Lacus Statoniensis (Mezzano)

Both Pliny and Seneca allude to the existence of a lake "in agro Statoniensi," in which there were floating islands. In Seneca's words, "another in the Lake of Statonia, swimming upon the water."



Philippi Cluveri's Italia Antiqua (1624) identifies Lacus Statoniensis with modern Lago di Mezzano, west of Lago di Bolsena, i.e. Lacus Tarquiniensis.

George Dennis, in The Cities and Cemeteries of Etruria (1883), concludes -- as an historian would -- that in the absence of observable corroboration, trust the first report.

So that we must either reject Cluver's conclusion, or suppose that the island has since disappeared. As there is no other lake in central Etruria which can answer to the Statonian, we must take the alternative, and consider the island to have floated, as it is described, and to have become eventually attached to the shores of the lake.

Lacus Tarquiniensis (Bolsena, Vulsinus)

From Pliny the Elder's Natural History,

In the great Lake Tarquinia of Italy, two Islands carry about with them groves, one while appearing triangular, another while round, when they close one to the other by the drift of winds, but never four-square.

Today's lake contains two islands, neither floating, and by all geological sense, islands that have never floated.



Martana



Bisentina

The descriptive discrepancy has not gone unnoticed/.

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Travels Through Germany, Bohemia, Hungary, Switzerland, Italy and Lorrain (1756), Johann Georg Keyssler,

From the late improvements in natural philosophy it may be conjectured, that lakes, especially those of a large extent, may produce floating islands in the following manner: great quantities of the long grass growing at the bottom, detaches itself, and ascends implicated together up to the surface of the water; and the agitation of these lakes by storms causes a light slime to ascend, or impregnates the water with sandy or terrene particles which intermix with the floating grass, etc. The wind likewise drives the lighter sand from the shore, which also settles on the aforesaid mixture of grass and mud which increasing in length of time, is imagined to be a solid floating island. Hence it may be reasonably doubted, whether the fixed islands in the Lacus Vulsinus be those described by Pliny.

A Journal of Two Successive Tours upon the Continent in the Years 1816, 1817 & 1818 (1820), James Wilson,

Pliny had a strange notion concerning the two islands..., that they changed their figure with strong winds from round to square, and from square to triangular. I am always loth to believe that Pliny tells willful falsehoods, or that he talks absolute nonsense, but in this instance I cannot imagine what appearance could have produced such an illusion as to afford ground for the naturalist's unintelligible observation. The islands are of hard rock, but the surface is covered with fine fertile soil.

George Dennis' The Cities and Cemeteries of Etruria (1883),

Shall we not rather refer this unsteady, changeful character to the eyes of the beholders, and conclude that the propagators of the miracle had been making too deep potations in the rich wine of [the lake-side]? Now, at least, the islands have lost their erratic and Protean propensities, and, though still capt with wood, have taken determinate and beautiful forms, no longer plastic beneath the breath of Aeolus.

"Nuovi Contributi della Storiografia alla Forma Lacus Antiqui," Bollettino di Studi e Ricerche 9 (1994) by Alberto Barzano, espouses that Pliny's account of shape-changing floating islands resulted from lake-level change altering the apparent shorelines of the two land masses.

Lydia Calaminae

Pliny writes,

In Lydia there are floating islands called the "Calaminae" [Reed Islands] which are moved not only by the winds, but may also be punted about with poles where one pleases, and which were the deliverance of many citizens in the Mithridatic War."

Pliny's Calaminae may have been what's later been known as Lake Gygaean, Lake Coloe, and today, Lake Marmara in Turkey.

Pliny's report fits well with what else was known of Asia Minor. Varro (116-27 BC) attests to have in Lydia, seen the Isles of the Nymphs, which at the sound of flutes, float from the bank into the middle of the lake, circle and return to the shore.

Isigonus of Nycaea, dated between 100 BC and 100 AD, describes an annual festival of the region.

In Lydia there is a lake called Tala, which is sacred to the Nymphs. It has a great abundance of reeds, and in their midst is one that the local people call king. A yearly festival is held at which sacrifices are offered, and then the sound of a chorus rises on the shore of the lake. All of the reeds then dance, and the king, dancing with them, comes to the shore. The people crown him with fillets and send him away again, praying that he and they might come together again the next year, for this signaled that they would have a fertile season.

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Pliny writes of the River Nymphaeus, on the Black Sea coast of Anatolia,

In Nymphaeum there are some small floating islands called the "Saltuares" [Dancers] because they move in time with the feet of those marking the time during a concert.

On which -- and by what authority we're not informed -- "Floating Islands." Chambers's Journal, April 13 1850, elaborates,

At one time roaming in a magic circle, at another threading the mazes of a figure resembling that of a trigueta -- an instrument formed somewhat in the shape of the three legs which are borne as the arms of the Isle of Man.



Martianus Capella's De Nuptiis Philologiae et Mercurii, written between 410 and 429, even speaks of verification.

In Lydia there are islands called the Islands of the Nymphs, which Varro most recently reports that he saw: they move from the shore to the middle of the marsh to the music of flutes, then move in a circle, and then return to the shore.

Lake Marmara was and remains a marshy bog, what Pliny calls a "stagnum," shallow and eutrophic.

As for recent times, Anton von Osten mentions marshy islands in the lake in Denkwürdigkeiten und Erinnerungen aus dem Orient (1836-37), but does not specify if they were floating. In La Lydie et le Monde Grec au Temps des Mermnades (1893), Georges Radet claims to have seen them floating, but we're not provided further description



Lacus Vadimonis (Posta Fibreno, Bassano)

To Pliny the Elder, the floating island of Lake Vadimo was a fact.

Certain islands are always afloat, as in... Lake Vadimo, the dense wood near the springs of Cutilia while is never to be seen in the same place by day and by night,

Pliny the Younger's Epistulae provides us detail from what seems to be personal inspection, wondering why people willingly travel long distances to see this wonder, though they do not appreciate similar phenomena nearer to home. The nephew seems unaware of his uncle's discussion three decades previous.

Several floating islands swim about it, covered with reeds, rushes, and whatever other plants the fertile marshy ground nearby and the edge of the lake produce

Each island has its peculiar shape and size, but the edges of all of them are worn away by their frequent collisions with the shore and one another. They are all of the same thickness and buoyancy, for their shallow bases are shaped like the hull of a boat. This may be clearly observed from all sides: the islands lie half above and half below the water's surface. Sometimes they cluster together and seem to form a little continent; sometimes they are dispersed by the shifting winds; at other times, when the wind falls dead, they float in isolation.

Often a large island sails along with a small island joined to it, like a ship with its tender, or as if one were striving to out-sail the other; then again they are all driven to one spot on the shore, whose limits they thus advance; and now here, and now there, they diminish or restore the area of the lake, until at last they occupy the center again and so restore it to its usual size.

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Sheep, seeking grass, proceed not only to the shores of the lake, but also upon these islands, unaware that the ground is mobile, until, far from the shore, they are alarmed to find themselves surrounded by water, as though they have been suddenly placed there. When the wind drives them back again, they little perceive their return as their departure.

By the time of George Munz's Insulis Natantibus (1711), things had changed.

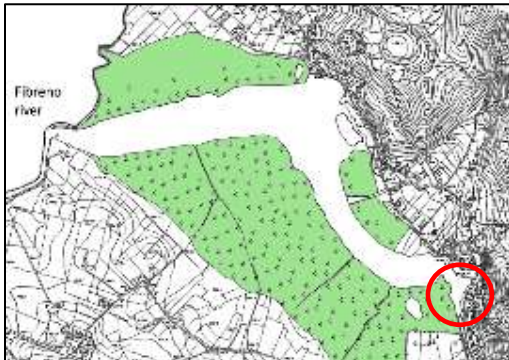
Floating islands, which because of their wandering motions are less durable, do not owe their origin to the Creation, but are born in time, and must be considered subject to birth and death through nature's various changes. Indeed, the floating islands which today exist in the Tiber region of Italy, in Pliny's time probably did not yet exist, for if they had existed, they would hardly have escaped the notice of so diligent a writer. Further, if floating islands are born in time, then they can perish too, and without a doubt from time to time some do perish, as the islands in Lake Vadimon described by Pliny and Seneca no longer exist today.

George. Dennis was likewise doubtful in The Cities and Cemeteries of Etruria (1883),

He who would expect Pliny's description to be verified, might search forever in vain. It is, indeed, no easy matter to find the lake; for it has so shrunk in dimensions, that what must have been a spacious tract of water in the olden time, is now but a small stagnant pond, almost lost in the tall reeds and bulrushes that wave over it. These we may conclude represent the islets, which either never had an existence, or have now clubbed together to stop up the lake.

The outlet of modern Lago di Posta Fibreno -- 0.28 square kilometers, 15-meter maximum depth, 2.7-meter mean depth -- is characterized by a wide reed stand area.

While today's Fibreno contains no floating islets, "la Rota," ("the wheel"), some 35 meters in diameter and 3 meters in thickness, floats in an isolated karstic pond just below the greater lake's southern end.



The floating island, an accumulation of peat, algae, grass, shrubs and trees, likely originated by an undercurrent that lifted it from the bottom 10 meters below, and it may be that subterranean inflow keeps the pond somewhat open today. The island moves with the wind and currents induced by subsurface springs.



At the floating island's center is a carpet of Sphagnum on which grow goat-willow, aspen, false sedge, serapis, knotty rush, marsh skullcap and bluegrass. Palisades of 1 to 1.5-meter tussock fringe the island and lakeshore.

At the beginning of the 20th century, a walnut tree in the bottom of the nearby sinkhole "The Prece" was uprooted by the fury of a storm and emerged a few days later beside the floating island.

A traditional fishing boat, the "nàue," made from wooden planks caulked with moss and flour, is used to ferry tourists to the island.

Lacus Albuleus (Regina, Isole Natanti, Solfatra)

"Lago delle Isole Natanti" translates to "Lake of the Floating Island," and, indeed, we've a consistent historical record to that effect.

Let us emphasize "historical," however, before we book a trip to see one. We'll return to today's situation after we chronicle some past writings. Lago delle Isole Natanti is noted for its accumulation of travertine, a form of limestone deposited by thermal springs.



All the lakes to this point in the chapter were asserted by Pliny the Elder to have had floating islands. To demonstrate how much the word of Pliny was trusted by geographers as late as the 18th century, George Munz's *Insulis Natantibus* (1711) disputed that the lake contained floating islands in Pliny's time simply on the basis of the Roman's silence.

While the sixteen floating islands of Lake Albuneus are today well known to all men of an inquisitive bent, it is hardly believable that Pliny, an extremely diligent writer, would have neglected to write about them, if they had existed in his time.

Our earliest record of floating islands is Andrea Bacci's *Discorso delle Acque Albule* (1564) note of such in the sulfurous Lago della Regina near Tivoli.

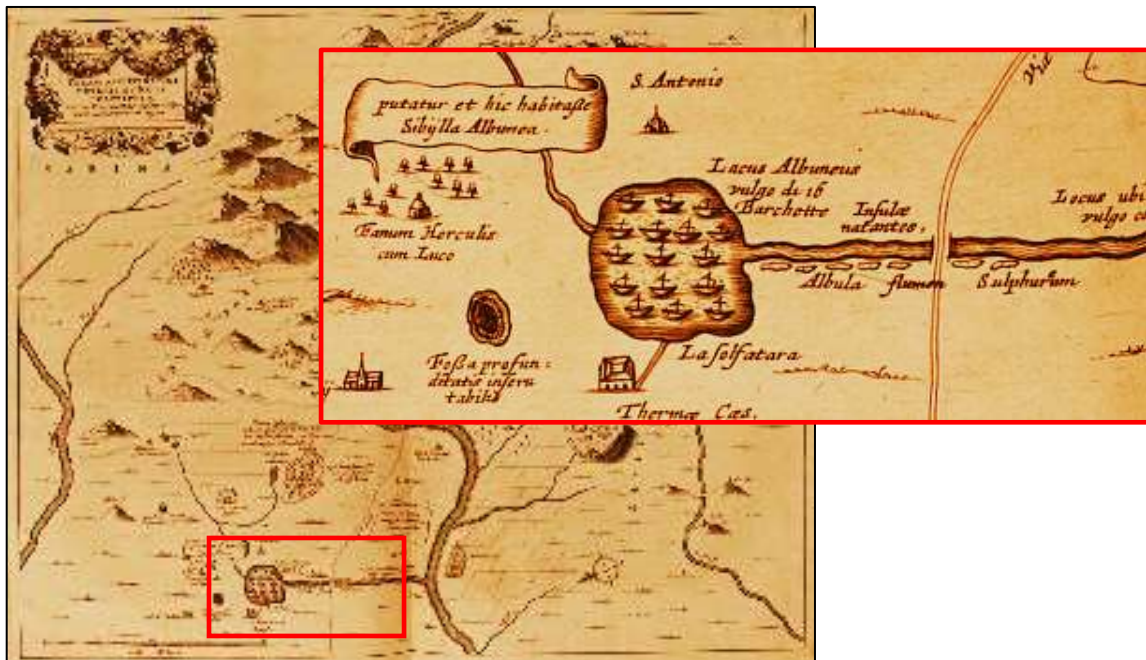
Athanasius Kircher presents his view in *Mundus Subterraneus* (1664) regarding the formation of such islands

Most floating islands form in lakes full of bituminous, sulfurous, nitrous, and similar material. First, various materials stick to each other through the viscosity of bodies that stick to them because they are moist; and these, as time passes, sink, whether through natural deposition, or

worn away by storms, winds, or rains, into a muddy (not rocky) soil. Soon thereafter, through the lightness of the material of which they are composed, they float, and thus become floating islands. It may also happen that a tuffaceous portion of the bottom of a lake, torn free by an earthquake or other occurrence, is carried to the surface by its own buoyancy to become a floating island. These are the means by which floating islands form.

They also disappear, or cease to float, or through frequent collision among themselves or with the shore of the lake over many years they are worn away and broken up into pieces, which then become fixed to the shore and grow together anew. Islands of this type may also be pressed down by the weight of ever-growing plants, stems, and branches, and also of the always increasing conglomeration of sulfurous and nitrous material, until that the specific gravity of the island exceeds the specific gravity of the water it displaces, and the island finally sinks by its own weight and settles at the bottom. This should suffice concerning the origin and dissolution of floating islands.

Kircher's Latium (1671) describes floating islands near Tivoli as "le sedict barchette," or "the sixteen little boats," leading the illustrator to depict small sailboats.



From its sulfurous odor, the lake was known as "la Solfatara." The islands sported osiers, esparto grass, other grasses, and brushwood. Kircher noted that some of the islands were round, while others were oval

Jacob Spon's Italianische, Dalmatische, Griechische und Orientalische Reise-Beschreibung (1681) estimating the floating islands' maximum length to be 25 paces, and their width, 15 paces. Their thickness was such that he could not stab down all the way through them with his sword. Spon judged the lake to be of great depth from the significant interval that elapsed between the dropping of a rock and the emergence of a bubble.

A second-hand account from the Jesuit Francesco Lana de Terzi in Magisterium Naturae, et Artis (1694),

I myself saw several of these islands in a small lake of sulfurous water not far from the Tiber; they were mostly circular or oval, and rose four or six inches above the water. Their surface is flat and grassy, and at the edges of some of them a few larger plants grow, which act as sails, so that even the slightest breeze pushes the islands from one part of the lake to another. The

largest of them are a few yards in diameter, yet nonetheless can sustain several men standing upon them.

Maximilien Misson, *A New Voyage to Italy* (1695) mentions that the largest of the islands was 15 feet long, and that two of his company stood on the smallest of them.

Girolamo Gigli, *Il Gorgoleo Ovvero il Governatore dell'Isole Natanti* (1753) mentions that local shepherds ride the islands

Ellis Knight, *Description of Latium* (1805) mentions that the floating islands are steady enough to support two or three people.

Richard Brookes, *A General Gazetteer, or Compendious Geographical Dictionary* (1821) adds that,

Some of these islands are 15 yards long, and will bear five or six people, who, by means of a pole, may move to different parts of the lake.

One could, of course, take the three above entries to be corroborative evidence, but those who spend time perusing the travel literature of those days, may suspect passed-along information.

Very much a first-person journal, *Rome in the Nineteenth Century* (1822), by Charlotte Eaton, confirms the presence.

We left the carriage to walk to it, and on our way we picked up a bare-legged Cicerone, a poor goat-herd, who told us all he knew about it -- and more. Arrived on the brink of the filthy flood, he embarked himself upon it on a little floating island of about two feet diameter, which was near the shore, and by the help of a long stick, navigated himself about in this new species of vessel. Several of these floating islands, some of much larger dimensions, were dispersed over the pond; they are produced by the plants cohering together, and formed into a solid mass by the thick deposit from the sulphureous water, which possesses the same petrifying property as the Tatarous Lake. Several rustics had, by this time, collected round us, all of whom assured us that the lake is bottomless. That, however, is not the case, though it is very deep, and in one place measures upwards of thirty fathoms. They threw in stones, and made us observe how it "boiled," as they called it. It certainly bubbled for several minutes afterwards with great activity, which arose, I presume, from the sulphurated gas being rapidly disengaged from the bottom by the percussion of the stone, and rising through the water. In the morning at sunrise, they assured us, it spontaneously throws up these bubbles, and is quite covered with mist and steam.

Humphry Davy, *Consolations in Travel, or, The Last Days of a Philosopher* (1829) describes the means by which the floating islands form.

The floating islands are real, but neither the Jesuit [Kircher] nor any of the writers who have since described this lake had a correct idea of their origin, which is exceedingly curious. The high temperature of this water, and the quantity of carbonic acid that it contains, render it peculiarly fitted to afford a pabulum or nourishment to vegetable life.

So rapid is the vegetation, owing to the decomposition of the carbonic acid, that, even in winter, masses of confervae and lichens, mixed with deposited travertine, are constantly detached by the currents of water from the bank and float down the stream, which being a considerable river is never without many of these small islands on its surface; they are sometimes only a few inches in size, and composed merely of dark-green confervae or purple or yellow lichens, but they are sometimes even of some feet in diameter, and contain seeds and various species of common water-plants, which are usually more or less encrusted with marble.

Lago della Regina, "The Lake of the Floating Islands," Saturday Magazine, December 25, 1841.

Our engraving presents a view of one of these lakes in the Campagna Romana, about fourteen miles from the city of Rome, of volcanic origin. Its ancient name was Aquae Albulae, since called Lago Tarturi, Lago Solfatare, or, Lake of the Floating Islands.



The water is of a bright blue color, highly charged with sulphur; it is much warmer than the atmosphere, extremely disagreeable to the taste, and possesses the property of petrifying all substances with which it comes in contact. Thus, the decomposed rushes and rank weeds with which the lake is bordered, falling therein, become hardened in very large masses, and float on the surface: hence the name, Lake of the Floating Islands. Its waters are reported to be fathomless, and no fish can live within its depths.

"Floating Islands," The Wonders of the World, in Nature, Art & Mind (1850), Henry Ince and Robert Mudie, Eds., speaks of the islands.

Near the gothic fortress of Castello Archione is a small lake containing several, formed of plants matted or joined together. The peasants get upon them, and with long rods navigate themselves about.

From Physiology and Calisthenics: For Schools and Families (1867) by Catharine Esther Beecher,

Upon the surface are floating masses of water-weed cemented by sand and dust blown hither by the wind, which form the so-called Isola Natanti... 1-1/2 m. N.E. are the smaller lakes of S. Giovanni and delle Colonnelle, the ancient Aquae: Albulae.

From Rome and the Campagna: An Historical and Topographical Description (1876) by Robert Burn,

They were connected with the Anio in Strabo's time by a subterranean canal called the Albula, which was stopped up in the course of ages by the deposits of sulphur in its bed, and the present channel was cut in 1549 by Cardinal d'Estc. One of the lakes, which is about 500 feet in length, has islands formed of matted weeds floating on its surface, and is thence called Lago Delle Isole Natanti. The other two lakes are called Lago di S. Giovanni and Lago delle Colonnelle.

The last two accounts drop mention of poling ferrymen. That which was observed sounds less substantial. Today's guidebooks straight-forwardly concede that Lago delle Isole Natanti has no such islands. Not even a credible spread of water lilies. The insular demise may be result of water diversion for thermal bath establishments.

There yet remain, however, vegetative mats attached to the edge of the nearby Lago delle Colonnelle.

Reflection

As we have unfortunately noted, most of the floating islands that amazed Pliny and other early scholars are not floating yet today, the absence prompting the 1780 Encyclopedia Britannica to lament,

History abounds with accounts of floating islands; but the greatest part of them are either false or exaggerated. What we generally see of this kind is no more than the concretion of the lighter and more viscous matter floating on the surface of the water in cakes; and, with the roots of the plants, forming congeries of different sizes, which not being fixed to the shore in any part, are blown about by the winds and float on the surface. These are generally found in lakes, where they are confined, and, in process of time, some of them acquire a considerable size.

Seneca tells us of many of these floating islands in Italy, and some later writers have described not a few of them in other places.

But however true these accounts might have been at the time when they were written, very few proofs of their authenticity are now to be found, the floating islands having either disappeared, or been so fixed to the sides as to make a part of the shore.

Pliny tells us of a great island which at one time swam about in the lake Cutilia in the country of Reatine which was discovered to the old Romans by a miracle, and Pomponius tells us that in Lydia there were several islands so loose in their foundations that every little accident shook and removed them.

Such gone-but-not-forgotten assessment was to be repeated verbatim in encyclopedic references for another 60 years.

Until the 20th century, the panicle of Western academicians was the pursuit of Egyptian, Hebrew, Greek and Latin writings. For that, those of us with interest in floating islands are forever in debt to Classical scholars. Any geographical feature to which Pliny, or other like him, even casually mentioned, has engendered linguistic scrutiny, scientific explanation and lengthy sleuthing of who said what when.

For most of the world's floating islands -- or better put, allegations of such, we have perhaps at best a century of observed record. As we've developed in earlier chapters, we've a spectrum of folk tales which, while perhaps culturally informative, provide nothing in the way of what we would consider to be "data."

The islands of this chapter, however, though we may never sort out some contradictions, are dated, in some cases measured or characterized in a manner that suggests dimension, and in many cases noted by more than one recorder.

Even from our seven-lake data set stem two conclusions:

The Italian lakes of Pliny's time contained a number of floating islands.

Those floating islands, in general, cannot be found today.

A conclusion which can't be drawn until we've cataloged today's geography relates to replenishment. Would the modern Pliny's report resemble in quantity, that of before?

For that, we've chapters ahead.

CHAPTER 33 REVEL WITH ROYALTY

Let us be clear on; we're dealing with real kings and queens, not the cartoonish tyrants of fictional realms such as Jonathon Swift's sky island of Laputa (Chapter 81), nor emperors of mythology (Chapter 2), nor the heathen commanders outwitted by the Rover Boys and their ilk (Chapter 11), nor royal pretenders such as Prince Roy of Sealand (Chapter 28). Our monarchs are real history, even if some of their floating islands are metaphoric.

To understand the first several floating, we view the world from the perspective of the Royal Court, a lofty gathering of pampered nobility whose duty was that of keeping the Regent entertained. A means of doing so was the "masque," an elaborately-staged performance involving poetry, music and design by professionals, while the courtesans danced in elaborate costumes.

Henry II, King of France, 1547-1559

Another bit of background is oft-employed literary device of the triumphant royal entry. A King enters whatever he enters with splendor, and what could be a more splendid vessel for His Majesty than an entire floating island? To the right, an engraving of Henry II entering Lyon on a nautically-unlikely floating castle.

It is said that Henry and his queen were served a meal that rose into the central room from below the deck.



Elizabeth I, Queen of England, 1558-1603.

Elizabeth I enjoyed lavish hospitality at the castles of her courtiers. Our episode deals with her stay at Kenilworth Castle in 1575, details of which are recorded "Lady of the Floating Island," Tales of the Kings of England (1840) by Stephen Percy.

Elizabeth was expected to honor Kenilworth Castle with her presence... She was mounted upon a milk-white horse, which she reined with peculiar grace and dignity; the ladies of the court.



Queen Elizabeth crossed the gallery-tower, and came upon the long bridge, which extended from thence rounded by floating pageants, representing seahorses, on which sat Tritons, Nereids, and other fabulous deities of the waters-made its appearance upon the lake, and floated gently toward the farther end of the bridge.

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On the islet was a beautiful woman, clad in a silken mantle, bound with a broad girdle inscribed with mystical characters. Her feet and arms were bare, but her wrists and ankles were adorned with gold bracelets of uncommon size. Amidst her long, silky, black hair, she wore a crown of artificial mistletoe, and bore in her hand a rod of ebony, tipped with silver. Two nymphs attended her, dressed in the same antique guise.

The pageant was so well managed, that this lady of the floating island, having performed her voyage with much picturesque effect, landed at Mortimer's Tower, with her two attendants, just as Elizabeth presented herself before that out-work. The stranger then, in a well-penned speech, announced herself as that famous Lady of the Lake, renowned in the stories of King Arthur, who had nursed the youth of the redoubted Sir Lancelot; since which time, she had never, she said, raised her head from the waters which hid her crystal palace: but now that so great a queen had appeared, she came, in homage and duty, to welcome the peerless Elizabeth to the castle.

The "Lady of the Lake," the titular name of the ruler of Avalon in Arthurian legend, is a staple of British folktales (Chapter 2).

The queen received this address with great courtesy, and made a gracious answer; whereupon, the Lady of the Lake vanished, and Arion, who was amongst the maritime deities, appeared upon his dolphin. But the good man who was to have performed the part had, early in the evening, partaken too freely of the festivities; and now, instead of delivering his speech, he tore off his vizard, and swore that he was none of Arion -- no, not he -- but only honest Harry Goldingham, whereat, the queen, being heartily tired of fine speeches, declared she was well pleased.

Or, to make it concise, from "Condensed Classics Kenworth," Long Island News and Owl, October 29, 1920,

The queen is adorned with countless jewels and attended by the ladies of the court and valiant knights magnificently attired, among whom Leicester glitters like a golden image, The procession advances over a bridge built for the occasion, and bore the courtiers dismount; a floating island reaches the shore and the "Lady of the Lake" announces that this is the first time ever risen to pay homage, but she could not refrain from obeisance to her gracious majesty.

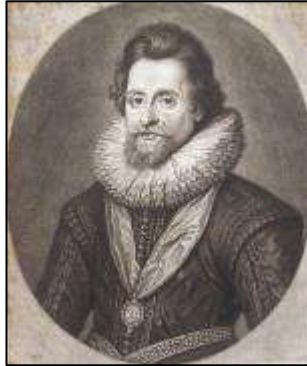
James I, King of England, 1603-1625, and Queen Anne

The Masque of Beauty was not presented until 1608, when it was the Queen Anne's pleasure "again to glorify the Court," in its author, Ben Jonson's words. The masque was performed the Queen and ladies of her court, and witnessed by King James.

We learn that the Ethiopian nymphs have been delayed by envious night, but are now approaching on a floating island,

where they have erected a Throne of Beauty, a classical illuminated structure, in which sit the masquers, each representing a component of Ideal Beauty, under the controlling power of Harmony, "The World's soul," the Queen herself.

As the floating island advances towards the front, the Throne of Beauty turns with a circular motion, while the surrounding steps, on which cupids sit, rotated in the other direction.



A few of the lines:

*The Nymphs at Sea, as they were almost lost,
Till, on an island, they by chance arriv'd,
That floated in the Main.*

*That at the Closes, from their Bottoms spring,
And strike the Air to echo what they sing.
But, why do I describe what all must see?
By this time, near the Coast, they floating be;
For, so their virtuous Goddess, the chaste Moon,
Told them, the Fate of th' Island should, and soon
Would fix itself unto thy Continent*



A bit later, the playwright's note:

Here, a Curtain was drawn, (in which the Night was painted,) and the Scene discover'd, which (because the former was Marine, and these, yet of necessity, to come from the Sea) I devised, should be an Island floating on a calm water.

From "Perpetual Motion and Othering in Ben Jonson's *The Masque of Blackness* and *The Masque of Beauty*," Upstart: A Journal of English Renaissance Studies, December 8, 2014, by Elisa Oh

The Masque of Beauty attempts to confirm the erring nymphs' whiteness and render it permanent by replacing the discourse of changing change with one of unchanging change. Rather than using stasis as the kinetic metaphor for enduring constancy, virtue, and whiteness, Beauty's perpetual motions of unchanging change insist that there will be no more forward motion now that whiteness has been achieved. This discourse of unchanging change emerges in the trajectory of the floating island.

Jonson's quest plot for Beauty narrates how four more black nymphs followed the original ones to seek whiteness too, but are imprisoned on a floating island by a female Vice figure, Night, and they cannot be freed until they see their sisters.

The nymphs' passive movements at sea, particularly on the floating island, reveal how much their agency has been curtailed in comparison to their sisters' travel in Blackness. Night "gyves" them on the floating island, a doubly disturbing image of enforced passivity and random, uncontrollable movement.

The cost of production was £4000 at a time the House of Stuart was running an annual deficit of £140,000.

The Memorable Masque, a Jacobean era production by George Chapman, was presented at court for the marriage in 1613 of James I's daughter, Princess Elizabeth to the Elector Palatine. In that work, a company of "Virginian knights... altogether estrangeful and Indian-like," arrive at Britain on a dreamy floating island under the conduct of Plutus, the god of riches. Plutus may seem out of place in the company of Indians, but as George Sandys (translator of Ovid and resident treasurer of the Virginia Company) explained: "Those Westerne climats abounded with gold and silver, wrapt in the secret bowels of the earth." Hence the Western Indies could be as fitting a home for Plutus as the Indies of Donne's "eastern riches."

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Another floating-island-themed masque of the day, The Roaring Girl (ca. 1607-10) by Thomas Middleton and Thomas Dekker:

*And here and there, whilst with obsequious ears
Throng'd heaps do listen, a cut-purse thrusts and leers
With hawk's eyes for his prey; I need not shew him;
By a hanging, villainous look yourselves may know him,
The face is drawn so rarely: then, sir, below,
The very floor, as 'twere, waves to and fro,
And, like a FLOATING ISLAND, seems to move
Upon a sea bound in with shores above.
These sights are excellent!*

The viewpoint is that from the stage, an actor's perception of audience. The audience, however, would not feel like a "floating island." As there are no subterranean bonds between actors and audience to be tightened this way, the image, vivid though it may be, has nowhere to go.

Charles I, King of England, 1625-1649

In Neptune's Triumph for the Return of Albion (1623), also by Johnson, the "great commands" of Neptune, i.e. King James, have been executed, and a floating island has been dispatched to bring home Prince Charles.

Charles and his companions are seated on the island are beneath the tree of harmony, followed by three transformation scenes a maritime palace, a seascape, and the British fleet discovered.

The Fortunate Isles and their Union (1625), Johnson's final masque, revives the floating island of Neptune's Triumph, as Macaria, now conflated with the classical image of the Islands of the Blest, where the heroes and great poets live eternally. As the islands of Great Britain have already been united by James, Macaria has been instructed to attach herself to the Kingdom.



Apollo, god of poetry, hovers above with Harmony and the spirits of music. Below sits Prince Charles with his companions in the guise of ancient heroes beneath palm trees symbolizing peace and victory.

*Great king,
Your pardon, if desire to please have trespass'd
This fool should have been sent to Anticyra,
The isle of Ellebore, there to have purg'd,
Not hoped a happy seat within your waters. —
Hear now the message of the Fates and Jove,
On whom these Fates depend, to you, as Neptune,
The great commander of the seas and isles.*

*That point of revolution being come
When all the Fortunate Islands should be join'd,
Macaria one, and thought a principal,
That hitherto hath floated, as uncertain
Where she should fix her blessings, is to-night
Instructed to adhere to your Britannia
That where the happy spirits live, hereafter
Might be no question made, by the most curious,
Since the Macaria come to do you homage,*

And join their cradle to your continent.

For more regarding the "Fortunate Islands," see Chapter 3.

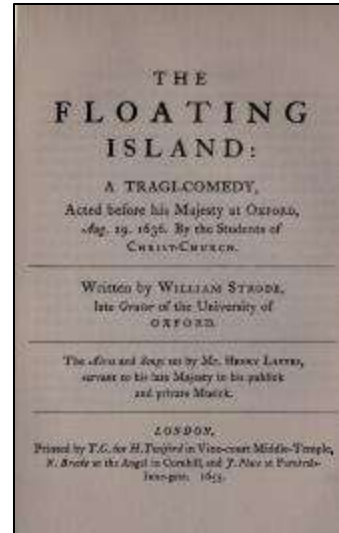
William Strode's The Floating Island: A Tragi-Comedy (1636) departs -- we are relieved to note -- from the solicitous masque. Strode's work is one of social criticism.

Anger, Malevolence, Melancholy and other inhabitants of the Floating Island are weary of King Prudence's and plot his overthrow. Passion, one of the mob, runs rampant and at the end, they call for Prudence to return to the throne. It's the English Civil War, 1642–1651.

*After the Appearance of a Floating Island, Enter the Prologue, as
Coming out of the Sea*

*Whatever Element we light upon,
(Great Monarch & bright Queen) 'tis yours alone.
Shook from my station on that giddy Shore,
That floats in Seas, in wretchedness much more,*

*The Isle is settled. Rage of Passions laid
Phancy to Prudence bows. Let all be staid
In your Acceptance too, and then each breast
Will cease its Floating, and as firmly rest
As doth our Scene. One Passion still would prove
An Actor when the Scene is shut. Our Love.*



Regarding the island's staging, "Oxford as Scenic Pioneer. Historic Productions at the University - The Use of Moveable Scenery," New York Dramatic Mirror, March 23, 1907,

It was on August 29. 1630, that the first performance before Charles I took place, a wretched morality called The Floating Island, said by my Lord Carnavon to be the second-worst play he ever saw, the absolute worst having been produced at Cambridge. (Such have always been the rivalries between the two great juncture were on the verge of permanently universities.) Strode's vile concoction called for five changes of scene, as well as the employment of some elaborate mechanical effects. Despite the fact that Inigo Jones provided the scenery for the second piece played before the King, it has been argued by a writer in The Architectural Review for July, 1898, who bases his contention on the absence of direct evidence that the mounting of The Floating Island was not under the famous architect's immediate superintendence.

When Charles I (the Prince in Neptune's Triumph, but now King in his own right) visited Oxford, The Floating Island was performed before him and Queen Henrietta at Christ Church. According to A Dictionary of Old English Plays (1860) by James Halliwell,

It contained too much morality to suit the taste of the court; yet it pleased the King so well, that he soon after bestowed a canon's dignity on the author.



Gustav II, King of Sweden, 1741-1792

Chapter 48 describes the intermittent nature of the floating island of Ralangen, but here we'll note that it was visited by Gustav II in 1766.

"On the Occurrence of Metallic Iron in Fossil Wood," Journal of the Franklin Institute, January 1853, by W.G. Lettsom

The specimen of fossil wood in question was detached on the 28th August, 1798, from the thick end of the trunk of a tree that was met with on the floating island in the lake of Ralang in Smaland. This island, after being submerged for four years, had risen to the surface the evening before. At the end of the trunk there were two plates of copper, bearing an inscription commemorative of the date when Gustavus II visited this singular island, which appears in its origin to have formed a tongue of land boarded over, which became detached from the mainland by action of the waters of the lake. It is usually submerged, but from time to time it rises to the surface for a few days, most commonly in the months of August and September.



Kabalega I, King of Bunyoro, 1870-1899, and Muwanga II, King of Buganda, 1884-1889

The last two kings in pre-colonial Uganda, Omukama Kabalega and Kabaka Muwanga, fled when British colonial forces overran their respective kingdoms..

It is said that both disappeared into the suds, a very likely possibility, but both eventually ventured back to firmer ground where they were captured and exiled to the Seychelles.



Tupou IV, King of Tonga, 1965-2006

Taufa'ahau Tupou IV is mentioned in Chapter 53 for his invasion of the rogue artificial island, the Republic of Minerva. The republic-to-be wasn't actually floating -- it was just an exposed shoal -- and the Tongan force of work-released convicts wasn't personally led by the 350-pound Commander-in-Chief, but it's somewhat close to being about a king and a floating island.



Charles V, Holy Roman Emperor, 1519-1556, and Philip II, King of Spain, 1554-1598

"Aa" in old-Dutch means water. Saint-Omer (Audomaropolis in Roman times) formerly lay at the head of the Aa's estuary. As the tidelands were reclaimed, the Aa has since become a canal to Dunkirk.



1609 map



Simon Ogier, Sylvarum Libri Sex (1584) mentions the Aa's floating islands

And you create fish of all kinds, and floating islands (found nowhere else) you offer up to astonished eyes, which serve as rafts, and swiftly follow wherever men wish and the heavens' breezes lead. In these you see shady stands of trees and fruit hanging on the branch, and you pick white lilies and hold pleasant feasts to purple Bacchus, and celebrate festive dances with a cheerful lyre. On these same islands, lest anyone think me a liar, noble King Charles and his son Philip liked to refresh their war-weary spirits, and often ordered banquets and drinks served there.



Charles V



Philip II

The islands are again mentioned by Jean Jacques Chifflet in Portus Iccius Iulii Caesaris Demonstratus (1627).

Claude Dausque mentions reeds, ferns, rushes, an ilex or holm oak, alder and willow growing on the island .in Terra, et Aqua seu, Terrae Flutantes (1633), adding,

Two portions of the floating islands, located in the part of the marsh that is called Calmuria, belong to the Abbot of Clairnrais. Other of the floating islands in this area belong to private

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persons, about sixty in number. Many of the floating islands are quadrangular. The largest of them do not exceed 150 feet in length, and their width is less.

Louis XIV, King of France, 1643-1715

In 1667, Louis XIV was escorted to the "Princess," the prettiest floating mass of weeds and peat. From this time onward, this boat trip became a favored pastime of the bourgeois.

Although Louis XIV was the last monarch to tour the feature, the remarkable island itself merits a bit more coverage.

From Insulis Natantibus (1711) by George Munz,

Nor indeed would it be implausible if one were to deny that the floating islands at St. Omer are of antique origin, because even today, despite the innumerable dikes built to prevent them, the assaults of sea waves upon these areas, and the floods, inundations, and devastation that come with them, have not been curbed.



Paul Pellisson-Fontanier's Lettres Historiques de Monsieur Pellisson (1729) contains a 1677 account,

S. Omer on Frontieres Artois. You see the isles covered very beautiful trees and an abundance of excellent pasturages for animals who gather there. You see these isles daily change place according to various water movements.

From Pierre Gassendi's Nicolai Claudii Fabricii de Peiresc. Senatoris Aquisextiensis (1706),

Moreover, there was nothing he [Peiresc] enjoyed more than to stand at that little lake in St. Omer watching the floating islands, which carried draught animals and men, and on which alders and willows grow with abundant leaves. Two years later he asked me, when I was making my way there, to examine the islands carefully; and to bring back a sample. I did this, and sent him a little branch, which I had plucked from a good-sized willow which was floating together with the soil in which it grew.

Niccolo Madrisio, Viaggi per l'Italia, Francia, e Germania (1718) attests to first-hand knowledge of the islands, significant in an era in which authors routinely passed on hearsay as fact.

A 1726 jotting by Voltaire appears in "An English Notebook of Voltaire," English Review, February, 1914.

Thirty and one of July one thousand seven hundred twenty and six, I saw floating islands nyer Saint Om[er].

Travels through France & Italy, and Part of Austrian, French, & Dutch Netherlands during the Years 1745 and 1746 (1803) by Alban Butler, regarding St. Omer,

In its lakes are several floating islands covered with grass. Fish shelter themselves under them as insects under a stick in the water. The fens make the air unwholesome.

"An Old Correspondent, Itinerary through Calais, St. Omer, Clairmarais, Aire, &c.," The Gentleman s Magazine, June, 1789,

The next day I viewed the suburbs of St. Omer, called the Haut Pont whence I determined to go to Clairmaraii, and for this purpose hired a small flat-bottomed boat no larger than a canoe, which the waterman pushed along with his pole at a pretty good rate, in the management whereof the Hautponois are very expert. We passed through many narrow channels by gardens well stocked with culinary plants and fruit-trees. These gardens and canals, by the influx of several waters, form a natural labyrinth.

At last, after a tedious circumnavigation, we reached the floating islands, the object of my little expedition. The islands, so called are formed by a co-germination of various aquatic shrubs, which, linked together, uphold the boggy substance, so as they may be moved at some little distance from their natural bed; which experiment was soon made, and which with much ease, by my honest pilot of the marines, having both of us landed designedly on one of them.

He afterwards directed my sight to another island, on which there was a cow pasturing, the animal, he told me, being commodiously shifted from one place to another, by drawing with a rope, and at last lo terra firma, the beast immediately leaping thereon, through frequent practice.

Several of the lesser islands were cultivated with garden plants.

In Voyage en France (1806), Nathaniel Wraxall mentions that there are 20 islands which range from 4 to 12 feet in diameter;

Two or three floating islands remained in 1827, but even these were not to last. As noted by Able Hugol, in France Pittoresque (1835),

The pond dried gradually and converted into marshes. Many of the islands have fixed or disappeared.

Hector Piers' Histoire des Flamands du Haut-Pont et de Lyzel, lies Flottantes, Portus Itius. Histoire des Abbayes de Watten et de Clairmarais, etc. (1836) mentions a celebration..

The floating islands were about 2.3 miles northeast of St. Omer. They were covered with large bushy shrubs, which the local people prevented from growing high lest they give too much purchase to the wind; their picturesque aspect made for a very pleasant sight, so that one could rest there peacefully in the shade and philosophize to one's heart's content.

In October of 1781, on the occasion of the birth of the Dauphin, elder brother of Louis XVII, the inhabitants of the suburb distinguished themselves mainly by demonstrating their joy with a phenomenal fire, which passed down the river Aa for a quarter of mile with the floating island upon which it was built. This floating island, having been decreased by eight feet in every direction so that it could be introduced into the channel, was twenty-four feet long and twelve feet wide; the bonfire was surrounded by growing fruit trees with their leaves still upon them and an infinity of apples. It lasted about three hours, and during this time, this island and the fire were carried down the channel by Ghyere and all the way to the walls of the city, to the great astonishment of the spectators, by the means of ropes which were attached to the trees; so that one saw an island decorated with fire wandering on the water; and when the island moved further away, it offered an enchanting spectacle, for the reflection in the water below represented another island and bonfire: a unique celebration which one could only see at St. - Omer.

"Floating Island, near St. Omer, in the Department of the Pas de Calais.," Hobart Town Courier June 22, 1838

The floating islands in the environs of St. Omer have constantly attracted the curiosity of the English continental tourist. These islands, of which there are fifteen, cover a space of about six to eight miles, on many of them there are wooden thatched habitations, forming a sort of small village for the persons employed in cutting the turf, of which a considerable quantity is consumed in the adjacent villages, and forwarded by barges to Bergnes, Dunkerque, Gravcliucs, Calais, and other parts, thereby affording the means of subsistence to hundreds of poor peasantry.

Old Correspondent, whom we cited earlier, helps us locate the site. The islands lay in what was originally a marsh on the city's eastern side. The 17th century map below shows the canals, long absent in the modern the aerial photo



1695

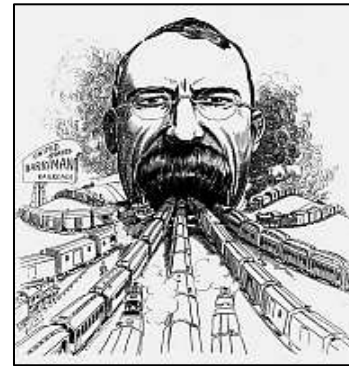


Today

Louis XVI, the Sun King, was beheaded. The floating island His Highness visited simply disappeared

E.H. Harriman, Robber Barron, 1848-1909

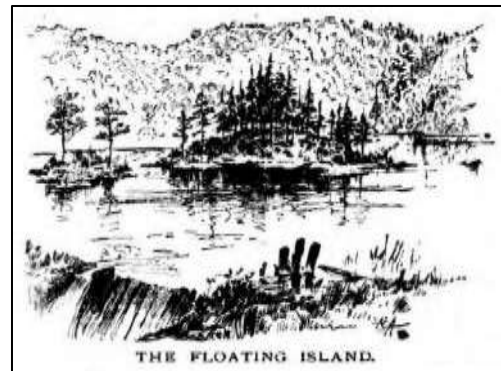
1907 Caricature



At the turn of the century, railroad magnate Edward Harriman owned, among other things, 30,000 acres in Arden, New York, including the 125-acre Cranberry Lake, created by damming a 30-acre pond.

An early reference to Cranberry Lake's famed feature comes from "Cranberry Lake's Floating Island," New York Herald, August 28, 1893. That the writer misidentifies the state, however, suggests that the intent may have been more a good story than accurate journalism.

Out in Picturesque Arden, New Jersey [sic] is a Great Natural Curiosity. Big Trees which Act as Sails. Once it Floated Along at Such a Rate as to Endanger the Natives' Lives. Towing it up the Lake.



Last Tuesday I took the train for Arden. At the station I asked the agent whether he had ever heard of a flouting island anywhere in that vicinity. He said he had, but did not know much about it. I could get the most information from F.J. Davis, superintendent of the Harriman dairy farm. He was one of the oldest residents and knew all about the floating island. Mr. Davis was found in the little milk house on the hill. He was busy "aireating" milk, a new process by which the animal odor and the taste of garlic and onions are eradicated from impure milk. I asked him if he could tell me where I could find the floating island.

"I don't know where you will find it now," said the dairyman. "Haven't seen it for several months myself, but I dare say you'll find it somewhere in Cranberry Lake.

"The island should lie somewhere near the mouth of the lake at this time of the year, but if it isn't there, keep around the bend on the right and you will run it down in the upper arm.

Upon my arrival at the dam I saw in the middle of the main body of the lake two islands. The smaller one had few trees upon it, but the larger one contained at least thirty full grown trees of the hemlock, larch and spruce variety. This was the floating island, as I judged from the description given me by Mr. Davis. Near the dam was an old neglected pier which had once been used as a landing for pleasure boats,

It was a warm afternoon and the water looked very inviting. It was not long before I yielded to the temptation and, taking off everything but my whiskers, dived in from the old pier and swam out to the island, a distance of about six hundred yards. Upon reaching the apex there was some difficulty in making a landing, as the moss and shrubbery along the water's edge were very thick. When ground was reached it was found to be soggy. It was sensitive to the weight of 175 pounds and could be shaken near the edge.

The undergrowth was too thick to permit travelling on the island with bare feet, so I plunged into the water again and swam around to the other end where the trees were largest. There the ground seemed to be solid. I could not shake it. There were no means of measuring the island accurately, but a mental survey showed it to be nearly two acres in extent, amply large enough for a house and a small vegetable farm. On the western side I found a short piece of a two-inch hawser fastened to a tree about fifteen feet from the edge of the island. The end of the rope which was nearest the water had rotted away entirely and the remainder was badly weather beaten.

The fact of the island's vagabond nature, however, is well attested.

"House for E.H. Harriman," New York Times, October 17, 1902,

E.H. Harriman is now preparing to erect on his country estate of 18,000 acres lying in and around Arden, a magnificent stone mansion at a cost of \$80,000 or more. It is his intention to build on Mount Orama, having an elevation of 1,500 feet, and close to the forest lake lying east of it, and located about three miles from his present residence. Nearby is Cranberry Lake, with a "floating" island half an acre in extent upon its surface. The new house will face the west and will command a beautiful view of the hills and valleys.

"Visited Harriman's Palace," Warwick Dispatch, June 5, 1907,

Through the kindness of Mr. Hiram Tate of the Advertiser, a party of Warwick teachers enjoyed an outing at Harriman's Orange county estate last Saturday.

The view is something grand -- a sea of mountains in one direction and beautiful fertile, cultivated Orange County in another, with clustering villages and innumerable farms. A chain of lakes nestle at the foot of the cliff.

At noon the party picnicked on the brow of the hill overlooking the lake of the floating island and were entertained the while by Mr. Ford, the genial manager who gave his time for the better part of the day to the visitors,

"Harriman's Palatial Country Home," Oregonian, July 18, 1909,

His new home is set squarely upon the top of a mountain, and commands an outlook over ranges of hills, shadowy forests and sequestered meadows, through which gleam running waters and the expanse of lakes.

From the loggie of the house one looks out upon three lakes, gleaming at the foot of a mountain in the center of the estate. One of these is Cranberry Lake, upon the bosom of which lies a floating island.

Harriman completed his 100,000 square-foot Arden House in 1909 and died within the year, and updates regarding the floating island of Cranberry Lake seem to have died with him.

Some 2 miles further east lies Tiorati Lake, one of some 30 lakes in what's now Harriman State Park, holdings donated to the public by the tycoon's estate.

Lake Tiorati, approximately 300 acres, is the result from a dam erected in 1914 inundating Big Cedar Pond and Little Cedar Pond and surrounding swamp.

Looking eastward from Arden House



And as the floating island of Cranberry Lake disappeared -- physically or journalistically, or maybe some combination thereof -- a floating island of Tiorati Lake came to be.

Guide to the Summer Birds of the Bear Mountain and Harriman Park Sections of the Palisades Interstate Park (1920), by Perley Silloway, shows the floating bog in Cedar Lake -- we're not sure which one -- before the water level was raised by the Tiorati dam.



As the lake level was raised -- a somewhat familiar story in the area -- more peaty bed material floated to the surface. "Floating Island Has Sunk," New York Evening Post, October 11, 1924, notes the corollary, that once freed to float, a buoyant mass will drop when the water is lowered.

That the Floating Island, that undulating mass of bog plants which lies in the southwestern corner of Lake Tiorati in the Harriman State Park, really floats is shown positively by what has occurred since the lake was lowered ten or twelve feet to repair the dam. The inland has dropped with the water level and shows no more of its mass above water than when the lake was at its highest stage.

"Nature Reclaims Artificial Lakes," Louisiana Conservation Review, February, 1932, draws on observations from Raymond Torrey, publicist for the park in the 1930s.

The smaller of the two Cedar Ponds, where Lake Tiorati now stands, was covered with white water lilies, but when the water rose 20 feet in a few months behind the dam, the lilies could not adjust themselves, and most of them failed to survive. Many species of bog and shore plants did survive, however, in the curious floating island which was formerly a part of the quaking bog around Little Cedar Pond. When the water rose, the bog tore loose from its former position and floated around the lake, until it finally came to a halt near the southwest end of the present lake.

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"Floating Island Cruises About New York Lake," Harrisburg Telegraph, July 17, 1946, picks up on the story a decade later.

For the first time in three years "the floating island of Lake Tiorati" is off on a summer cruise, much to the popeyed amazement of vacationers. The little island, an acre in size and home to several families of wood mice and birds, is meandering along at the rate of several hundred feet a day. Even the most convivial picnickers are inclined to take the pledge when they wake tip from nap under the trees in Palisades Interstate Park and find that, the island which stood just offshore isn't there anymore.

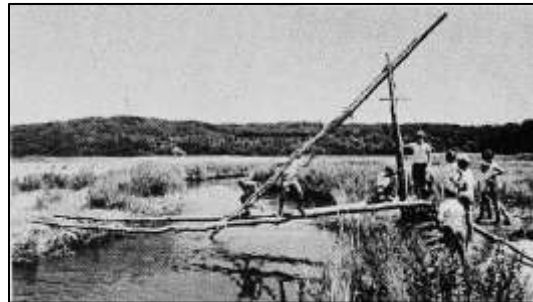
It is four feet thick and was anchored in Lake Tiorati by a few roots until the 1938 hurricane set it free to go a-sailing in any direction about the 320-acre lake. Sometimes it ties up for weeks or years at a time. This year it has the wanderlust and park officials are inclined to view its caprice indulgently.

American Weekly, March 23, 1947, adds detail.

The island, an acre of shrubs, grass, earth and saplings, travels at the whim of the wind, carrying its population of birds and field mice. It has been clocked as moving up to 300 feet in four hours, and a rate of drift of a foot per minute is not uncommon.

We've a few hints of floating features in the less-distant past.

Boy Scouts, 1968



Harriman State Park (2010), by Ronnie Coffey, mentions a vegetation survey on pieces of "the floating island" in 1970.

As with Cranberry Lake, Tiorati's newsworthiness is now largely archival. Flotation of peaty biomass is common in the region -- nearby Mombasha Lake and Little Long Pond being two that likewise made the news -- but without a tie to the mega-rich, Tiorati's story may have been not much of a story.

CHAPTER 34

DON'T EAT THE APPLE

We've noted a variety of trees sprouting on floating islands, but here we're dealing with a tree more significant. Intoxicated with the floating island of Eden, we may be tempted to taste the fruit of the Tree of Knowledge of Good and Evil.

Genesis 3:1-7

Now the serpent was more crafty than any of the wild animals the Lord God had made. He said to the woman, "Did God really say, 'You must not eat from any tree in the garden'?"

The woman said to the serpent, "We may eat fruit from the trees in the garden, but God did say, 'You must not eat fruit from the tree that is in the middle of the garden, and you must not touch it, or you will die.'"

"You will not certainly die," the serpent said to the woman. "For God knows that when you eat from it your eyes will be opened, and you will be like God, knowing good and evil."

When the woman saw that the fruit of the tree was good for food and pleasing to the eye, and also desirable for gaining wisdom, she took some and ate it. She also gave some to her husband, who was with her, and he ate it. Then the eyes of both of them were opened, and they realized they were naked.

So what, we might reasonably ask, does this story have to do with floating islands?

Let us begin from the perspective of cosmologies other than Hebrew.

Anaximander, a Greek of the 6th century B.C., envisioned the earth as being one-third as high as its diameter and floating freely in the center of the celestial vault because there is no reason for it to move to one side or the other.

The earth is on high, held up by nothing, but remaining at the center, fixed by necessity and equal distance from all things.

Venerable Bede, 7th century, regarded the earth as formed upon the model of an egg. From Daniel Boorstin, *The Discoverers* (1985),

The earth is an element placed in the middle of the world, as the yolk is in the middle of an egg; around it is the water, like the white surrounding the yolk; outside that is the air, like the membrane of the egg; and round all is the fire, which closes it in as the shell does. The earth, being thus in the center, receives every weight upon itself; and, though by its nature it is cold and dry in its different parts, it acquires, accidentally, different qualities; for the portion which is exposed to the torrid action of the air is burned by the sun, and is uninhabitable; its two extremities are too cold to be inhabited; but the portion that lies in the temperate region of the atmosphere is habitable. The ocean, which surrounds it by its waves as far as the horizon, divides it into two parts, the upper of which is inhabited by us, while the lower is inhabited by our antipodes; although not one of them can come to us, nor one of us to them.

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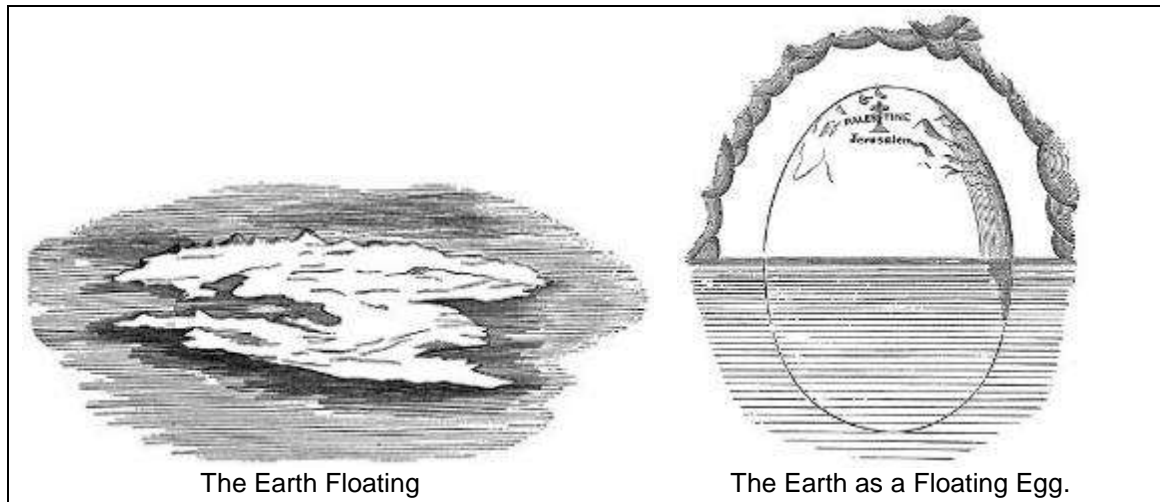
Chapter 34 -- Don't Eat the Apple

Muhammad al-Idrisi's Tabula Rogeriana (1154) likewise hypothesized the earth to be like an egg, the inhabited hemisphere being the portion floating above the great ocean.



"Engravi - Abu Muhammad Al-Idrisii,"
copied by Villiam Vincent, Commentary
on Arrian's Voyage of Nearchus (1797)

Below, a pair of images from Astronomical Myths Based on Flammarion's History of the Heavens (1877), by John Blake



It's thus been long held that the world is a floating object.

It's likewise been widely held that the primordial earth was a place of wonder. We offer two quotes to that effect.

The Origin of Pagan Idolatry (1816) by George Faber,

Paradise or Elysium is variously placed in a floating island, on the top of a high mountain, in the central cavity of the Earth, and in the circle of the Moon

Thus we are told, on the one hand, that the Sun was a husbandman; that he was borne out of the deluge, that he sailed in a ship over the surface of the ocean, that he was produced, like an infant out of the womb of its mother, from the calix of the mystic Lotos, while it floated on the bosom of the mighty deep, that he was born from the door of a rocky cavern, that he slept, during the interval between the destruction of one world and the new creation of another, on the folds of a huge water serpent, coiled up in the shape of a boat and thus safely supporting him on the top of the waves, that he once saved himself from the fury of the ocean by taking refuge in a floating island, that he reigned upon earth after the flood, the most ancient sovereign of the postdiluvian world.

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"Sacred Places," Wesleyan-Methodist Magazine, July 1851,

When we remember these multifarious attractions, we cannot wonder that the mythic fancy of antiquity peopled these isles with imaginary beings, and dedicated them to the gods. We have seen how sacred was the isle of Delos, fabulously said to have been once a floating island. This, and similar places, and especially the legendary "Isles of the Blessed," were Edens in more than the poet's sense -- with their mystic and miraculous trees, their consecrated shrines, towers, or tabernacles, the defense of fire, and their compounded animal figures. And, in regard to most of them, they abounded in legends of a monstrous serpent, Python, Typhon, or the Dragon, who was slain by an earth-born deity -- a deity born within the consecrated precincts. Such are the beautiful fables that endear the names of Delos, Rhodes, Anaphe, and the Insulae Beatae, to the classical student.

Biblical Interpretations

It's entirely within this framework that a floating island identity has been artistically associated with Eden of the Book of Genesis. A circular paradise floats adrift in the sea of everything while Eve emerges from Adam's side.



Bible of Anton Koberger (1493)



Jacob Philip Foresti, Supplementum Chronicarum (1510)

Chapter 34 -- Don't Eat the Apple

Ludolphus de Saxonia, Thoeck Vanden Leven ons Heern Ihesu Christi (1487)

The four rivers of Paradise, the Euphrates, Tigris, Gihon and Pishon, flow from the sea beneath.



Queen Mab (1813), by Percy Shelley, describes Eden as follows.

*Its floors of flashing light,
Its vast and azure dome,
Its fertile golden islands
Floating on a silver sea;*

As a humanistic progressive, i.e., one who minimizes the moral bent of the Genesis story, Shelly argues that contemporary societal evils will dissolve in time and virtuous mentality will emerge.

Chapter 2 makes note of the Edenic Western Islands, isles or paradise, sometimes floating, sometimes fixed, of coastal European folklore. We'll, however, now move closer to the present to discuss two popular works in which an allegorical Eden is set on floating islands.

Perelandra

C.S. Lewis' Perelandra (1943), the second novel in Lewis' Space Trilogy, is based on the notion that the surface Venus is covered with fresh water, to which for plot purposes, Lewis adds floating islands.

The setting occurred to Lewis when he began pondering the purpose of the forbidden fruit in the Garden of Eden and realized it was to instill obedience.

Of Other Worlds (1966), an anthology of literary criticism published posthumously, "Unreal Estates" is the transcript of a conversation between Lewis and authors Brian Aldiss and Kingsley Amis that took place in Lewis' rooms in Magdalene College.

The starting point of the second novel, Perelandra, was my mental picture of the floating islands. The whole of the rest of my labors in a sense consisted of building up a world in which floating islands could exist. And then of course the story about an averted fall developed.



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The book grew as well out of a recurring image Lewis most likely got from Olaf Stapledon's Last and First Men (1930).

In early days on Venus men had gathered their foodstuff from the great floating islands of vegetable matter which had been artificially produced before the migration. But as the oceans became populous with modifications of the terrestrial fauna, the human tribes turned more and more to fishing. Under the influence of its marine environment, one branch of the species assumed such an aquatic habit that in time it actually began to develop biological adaptations for marine life.

From when he splashes down in the tropical seas of the planet Perelandra, until he witnesses the Great Dance, Perelandra's protagonist, Elwin Ransom, finds a paradise of floating islands and fixed lands "with nothing dead or spoiled."

One of the great patches of floating stuff was sidling down a wave not more than a few hundred yards away. He eyed it eagerly, wondering whether he could climb on to one of these things for rest. He strongly suspected that they would prove mere mats of weed, or the topmost branches of submarine forests, incapable of supporting him.

But here was another, not thirty yards away and bearing down on him. He struck out towards it, noticing as he did so how sore and feeble his arms were and feeling his first thrill of true fear. As he approached it he saw that it ended in a fringe of undoubtedly vegetable matter; it trailed; in fact, a dark red skirt, of tubes and strings and bladders.

For one second he was in a kind of vegetable broth of gurgling tubes and exploding bladders; next moment his hands caught something firmer ahead, something almost like very soft wood. Then, with the breath nearly knocked out of him and a bruised knee, he found himself lying face downward on a resistant surface. He pulled himself an inch or so farther. Yes -- there was no doubt now; one did not go through; it was something one could lie on.

His first discovery was that he lay on a dry surface, which on examination turned out to consist of something very like heather, except for the color which was coppery. Burrowing idly with his fingers he found something friable like dry soil, but very little of it, for almost at once he came upon a base of tough interlocked fibers. Then he rolled on his back, and in doing so discovered the extreme resilience of the surface on which he lay. It was something much more than the pliancy of the heather-like vegetation, and felt more as if the whole floating island beneath that vegetation were a kind of mattress.

The thing had looked, in that first glance, so like a real country that he had forgotten it was floating -- an island if you like, with hills and valleys, but hills and valleys which changed places every minute so that only a cinematograph could make a contour map of it. And that is the nature of the floating islands of Perelandra. A photograph, omitting the colors and the perpetual variation of shape, would make them look deceptively like landscapes in our own world, but the reality is very different; for they, are dry and fruitful like land but their only shape is the inconstant shape of the water beneath them.

Reducing the impression to its essence,

Hills and valleys which changed places every minute so that only a cinematograph could make a contour map of it,

Perelandra is more than a garden of unearthly delights, a pre-Edenic image of joy itself.

Chapter 34 -- Don't Eat the Apple

A Lady, human in form but green and innocently unclothed, greets him, explaining that she and the King are the only humanoid creatures on Perelandra, the King now temporarily separated by the unpredictable movements of the floating islands.



The Lady who has the respect, companionship, and obedience of all the animals. Resembling Eve and Adam before the fall, the Lady and her husband, the King, live in innocence and have never disobeyed the commands of their creator, Maleldil. The Lady's "purity and peace, however are "alive and therefore breakable."

Ransom finds it difficult to explain to the unfallen Lady how any event --including death -- can be other than the joyfully received gift of Maleldil. He describes evil as the clinging to a past or imagined good in the face of a new gift. The Lady professes some anguish at such thoughts, and Ransom prays to God to purify him, so that he may not taint Perelandra with the evil of his own world.

The scientist Weston, dressed as an African explorer, the personification of the Edenic snake, arrives in a boat, heavily equipped with instruments and provisions. Ransom urges the Lady not to talk or listen to him, but she discloses to Weston that she and the King are forbidden to dwell on the fixed land of Perelandra.

As she departs, Weston complains that Ransom is doing him an injustice, that they are fellow servants of God'. Ransom objects that not every spirit is good.

Declaring himself the "chosen vessel," Weston attempts to persuade the Lady at least to imagine entering the Fixed Land. Though Ransom warns of the danger, Weston's description of the women of Earth, greater than the Lady in wisdom and independence, prompts the Lady to a hymn of praise for the unforeseen gift of daughters who may once surpass her.

As they depart for the Fixed Land, the Chorus exhorts,

"Take Heart, You Firstborn of Perelandra - If your world falls, it too will be redeemed at last."

When riding to the Fixed Land at night on a dolphin's back, Ransom's delight has an element of déjà vu.

Warm and sweet, and every moment sweeter and purer, and every moment stronger and more filled all delights, it came to him. He knew well what it was.... the night-breath of a floating island in the star Venus. It was strange be filled with homesickness for places where his sojourn had been brief and which were, by any objective standard, so alien to our race. Or were they? The cord of longing which drew him to the invisible isle seemed to him at that moment to have been fastened long, long before his coming to Perelandra, long before the earliest times that memory could recover in his childhood, before birth, before the birth of man himself; before the origins of time. It was sharp, sweet, wild, and holy, all in one.

Ultimately, Weston is killed in physical combat by Ransom -- why is he so named? we are begged to ponder -- but we HERE needn't pursue New Testament correspondence.

On Earth, the temptation was to eat the fruit of the Tree of the Knowledge of Good and Evil; on Perelandra, the temptation is to get the Lady to live upon the Fixed Land.

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From John Leonard's review of The Inklings: C. S. Lewis, J. R. R. Tolkien, Charles Williams, and Their Friends (1979) by Humphrey Carpenter, New York Times, March 29, 1979;

Lewis worried his abstract way back to Christ and lived a life he didn't bother to examine. Whether he substituted Mrs. Moore for his lost mother is beyond my purview. That he was afraid of homosexuality is clear, and so was his talent for male friendship. His dream of a "floating island," an Eden before the Fall, is realized in "Perelandra." The Inklings may very well have been a floating island, too, a Bird and Baby on a pond of beer, followed by long walks in the rain. Maybe he would have been happier inside a Norse myth, the sun-crazed Hebrews were not in the Inklings style.

The Life of Pi

The beginning of Life of Pi (2001) by Yann Martel tells of the god Vishnu asleep on an endless sea, all of creation, the manifestation of his dreams.

Whereas Perelandra's Ransom portrays the vantage point of Christ, the castaway Indian youth Pi of this story assumes the role of the potentially-deceived.

Pi beaches upon a curious floating island when "I turned over to my other side," which is to say when he turns away from the practicality and the faith that had borne him far across the Pacific Ocean.



The island is composed of green tube-like algae without soil. Pi thinks it an illusion, but decides to try stepping out onto it.

[The] island, coated with such tightly woven, rubbery vegetation, was an ideal place to relearn how to walk. I could fall any which way, it was impossible to hurt myself.

He tastes the algae; the inside is salty, but the outside is sugary sweet. Pi continues to break off and eat pieces of algae. He drags himself to the shade of an algal tree, which smells like a lotus tree but is not.

Unlike the turbulence of the unpredictable ocean, the island is organized.

[It had] hundreds of evenly scattered, identically sized ponds with trees sparsely distributed in a uniform way between them, the whole arrangement giving the unmistakable impression of following a design.



Pi doesn't question fresh water ponds floating in the salt water sea.

I did not ask myself why the algae did this, or how, or where the salt went. My mind stopped asking such questions. I simply laughed and jumped into a pond.

Unlike true land, which has soil and mass, the island seems unaffected by real life.

Waves that fell upon the island simply vanished into its porosity.

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[I] would have trusted staying on it during the worst hurricane. It was an awe-inspiring spectacle to sit in a tree and see giant waves charging the island, seemingly preparing to ride up the ridge and unleash bedlam and chaos-only to see each one melt away as if it had come upon quicksand. In this respect, the island was Gandhian: it resisted by not resisting. Every wave vanished into the island without a clash, with only a little frothing and foaming."

He realizes that the trees draw water from the sea below, which then passes through their stems and forms the bubbles.

They were like none I had ever seen before. They had a pale bark, and equally distributed branches that carried an amazing profusion of leaves. These leaves were brilliantly green, a green so bright and emerald that, next to it, vegetation during the monsoons was drab olive.

Pi sets out to explore, science offering respite in the absence of faith. The island is of uniform thickness and six or seven miles across. Pi uses pi to calculate the circumference.

But as Pi looks deeper, monotony and pointlessness begin to emerge.

The same blinding greenness throughout, the same ridge, the same incline from ridge to water, the same break in the monotony: a scraggly tree here and there."

Even the trees are of the same substance as the algae.

[The] roots did not go their own independent way into the algae, but rather joined it, became it. Which meant that these trees either lived in a symbiotic relationship with the algae, in a giving-and-taking that was to their mutual advantage, or, simpler still, were an integral part of the algae.

The island hosts a multitude of meerkats, some of which are huddled around a pond. Suddenly the meerkats dive in and emerge with large dead fish.

Pi attempts to overnight in the trees with the meerkats and is woken by their crying in excitement over the dead fish floating to the top of the pond, but observes,

Not a single meerkat went down to the pond. None even made the first motions of going down. They did no more than loudly express their frustration. I found the sight sinister. There was something disturbing about all those dead fish.

In the morning, the fish are gone

At the island's center Pi finds a fruit-bearing tree, but within the leafy skin of its produce lies a human tooth.

Increasingly aware that not all is as it seems, Pi drops a meerkat from the tree where he sleeps and the animal climbs back up, licking its paws. When Pi gingerly steps onto the ground, his feet burn and he too climbs back up. Pi reasons that the surface of the island exudes acid at night and digests that which it contacts.

Pi's innocence is shattered and he realizes that he must leave.

By the time morning came, my grim decision was taken. I preferred to set off and perish in search of my own kind than to live a lonely half-life of physical comfort and spiritual death on this murderous island.

Though Pi tries to take some of the algae with him, he finds it cannot exist independent of the island itself. Nonetheless, it is better to return to the peril of the sea than to live as a meerkat. As with Adam and Eve, Pi had to choose the path of the believer or the non-believer. The floating island was his test.

Summary

In a brief manner, we noted that the paradisiac Garden of Eden lends itself to representation as a floating island. What transforms the biblical Eden account from a utopian dream to the sage of humanity -- and thus why the legend is timeless -- is the lure of free will.

Two Eden-inspired works of modern literature, Perelandra and The Life of Pi, employ the floating-island setting, though in the first, partaking from the Tree of Knowledge of Good and Evil is represented by leaving the floating island for a fixed one. In the second, more like Genesis in geography, the tree lies at the island's center.

In Perelandra, orthodox in Judeo-Christian theology, consuming the fruit opens the soul to the tribulations of human survival. In Pi, a humanistic anti-clerical take, consuming the fruit relegates the future to one of numbed mindlessness. In both works, tasting from the Tree of Knowledge of Good and Evil -- the Lady does and Pi doesn't -- leads to death.

CHAPTER 35

PREPARE FOR THE FLOOD

Boats and ships are like floating islands that enable the insular way of life to become mobile... Boats, rafts and other crafts are an island's floating analogues and replacements. In Noah's Ark, the metaphors of the island and boat as rescuing refuges are united. -- Kaia Lehari, in "Island," Place and Location (1998)

One needn't subscribe to any particular religious creed to be familiar with the tale of Noah and his Ark. From Chapter 6, the Book of Genesis,

Noah was a righteous man, blameless among the people of his time, and he walked faithfully with God... God saw how corrupt the earth had become, for all the people on earth had corrupted their ways. So God said to Noah,

"I am going to put an end to all people, for the earth is filled with violence because of them. I am surely going to destroy both them and the earth. So make yourself an ark of cypress wood; make rooms in it and coat it with pitch inside and out. This is how you are to build it: The ark is to be 300 cubits long, 50 cubits wide and 30 cubits high

The dimensions work out to be 137 by 23 by 14 meters, or 160 by 26 by 16 meters, depending in the type of cubit. The Ark's displacement would have been about 22,000 tons. For comparison, the Titanic displaced 46,000 tons and the Queen Mary 2, 148,500.

A 22,000-ton steamer passing through the Panama Canal



"Make a roof for it, leaving below the roof an opening one cubit[e] high all around. Put a door in the side of the ark and make lower, middle and upper decks.

The early Church interpreted the shape to be that of a truncated pyramid. Not until the 12th century did the Ark it come to be thought of as a rectangular box with a sloping roof.,



"I am going to bring floodwaters on the earth to destroy all life under the heavens, every creature that has the breath of life in it. Everything on earth will perish. But I will establish my covenant with you, and you will enter the ark -- you and your sons and your wife and your sons' wives with you. You are to bring into the ark two of all living creatures, male and female, to keep them alive with you. Two of every kind of bird, of every kind of animal and of

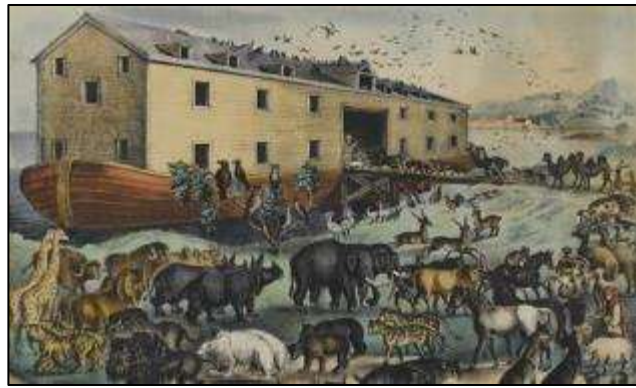
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every kind of creature that moves along the ground will come to you to be kept alive. You are to take every kind of food that is to be eaten and store it away as food for you and for them."

Noah did everything just as God commanded him.



Nuremberg Chronicles (1492)



Currier & Ives (1845)

The Lord then said to Noah,

"Go into the ark, you and your whole family, because I have found you righteous in this generation. Take with you seven pairs of every kind of clean animal, a male and its mate, and one pair of every kind of unclean animal, a male and its mate, and also seven pairs of every kind of bird, male and female, to keep their various kinds alive throughout the earth. Seven days from now I will send rain on the earth for forty days and forty nights, and I will wipe from the face of the earth every living creature I have made."

And Noah did all that the Lord commanded him.

The account is explicitly one of a constructed vessel. The Ark was "a thing of boards and nails," according to the Islamic version of the story, Surah 54:13.

Deluvianists are those who support a literal interpretation of the Biblical flood survived by only the patriarch Noah and his family. While geologic evidence for such a scenario may be scant, the world's mythology is rife with similar stories, but as we shall see, not all entailing a wooden vessel.

A Babylonian Account

"Relic Reveals Noah's Ark Was Circular," Guardian, January 1, 2010, ties the salvation story to a reed raft, not at all a surprising association for a civilization that yet today constructs islands of that material (Chapter 36).

According to newly translated instructions inscribed in ancient Babylonian on a clay tablet telling the story of the ark, the vessel that saved one virtuous man, his family and the animals from god's watery wrath was not the pointy-prowed craft of popular imagination but rather a giant circular reed raft.

Quoting Irving Finkel, a British Museum expert, who translated the above-referenced cuneiform script,

"In all the images ever made people assumed the ark was, in effect, an ocean-going boat, with a pointed stem and stern for riding the waves -- so that is how they portrayed it. But the ark didn't have to go anywhere, it just had to float, and the instructions are for a type of craft which they knew very well. It's still sometimes used in Iran and Iraq today, a type of round coracle which they would have known exactly how to use to transport animals across a river or floods."

In his translation, the god who has decided to spare one just man speaks to Atram-Hasis, a Sumerian king who lived before the flood and who is the Noah figure in earlier versions of the ark story.

"Wall, wall! Reed wall, reed wall! Atram-Hasis, pay heed to my advice, that you may live forever! Destroy your house, build a boat; despise possessions and save life! Draw out the boat that you will built with a circular design; Let its length and breadth be the same."

The tablet goes on to command the use of plaited palm fiber, waterproofed with bitumen, before the construction of cabins for the people and wild animals.

It ends with the dramatic command of Atram-Hasis to the unfortunate boat builder whom he leaves behind to meet his fate, about sealing up the door once everyone else is safely inside:

"When I shall have gone into the boat, Caulk the frame of the door!"

Other Ancient Traditions

George Faber's three-volume The Origin of Pagan Idolatry (1816) finds the floating-island association to be widespread.

The Ark was not only an island, but a floating island; not only a floating island, but a ship: the Earth therefore, which is really an island, was pronounced to be a floating island; and, as the smaller World was a ship, the larger World was also determined to resemble a ship, and as such was symbolized by the sacred boat.

Faber arrives at this association from different beginnings, one, for example, being the Celtic, "A Poem of Taliesin, called Mic Dinbvch, a View of the Bardic Sanctuary."

A holy sanctuary there is, on the wide lake; a city not protected with walls; the sea surrounds it.

Edward Davies' The Mythology and Rites of the British Druids (1809) expands the account.

This sanctuary is in the island which had floated on the wide lake, but was now fixed on the margin of the flood. Here the sacred ox, the Ych Banawg, is stationed before the lake, to draw the shrine through the shallow water to dry ground.

The Britons, as we have seen in the preceding section, represented the deluge as having been occasioned by the bursting forth of the waters of a lake. Hence they consecrated certain lakes, as symbols of the deluge, whilst the little islands which rose to the surface, and were fabled to have floated, or else artificial rafts, representing such floating islands, were viewed as emblems of the ark, and as mystical sanctuaries.

Faber then extends Davies' "floating island" interpretation.

Mr. Davies rightly infers, that, in times of Druidical Paganism, the lake was furnished with a floating raft, which, like the Egyptian Chemmis, represented the Ark, while the sacred pool, which contained it, shadowed out the deluge.

That by an artificial floating island was meant the Ark, he proves from an ancient mythological poem of Taliesin, which throughout treats of the deluge and of the wonderful escape of the far-famed eight in a mysterious vessel. This vessel is denominated a Caer or a fenced enclosure; which was likewise a name of Stonehenge, because it represented the holy circle of Sidi or Ua, that surmounted Meru and symbolized at once the Ark and the World: yet the Caer, though it is spoken of as the ship in which the eight sailed over the waters of the flood, is nevertheless described as an island. The obvious conclusion therefore is, that a floating island typified the Ark.

But I see not what this ship can possibly mean, except the Ark of Noah. The Ark therefore, for some reasons or other, was thought by the pagan mythologists to bear a close affinity to the Moon, to the Earth, and to a floating island. Why it was compared to the last of these, need scarcely be pointed out: and, why it was supposed to resemble the two former, may easily be

ascertained by attending to the general principles of heathen theology, which ever delighted in tracing similitudes and in using hieroglyphics.

From another direction, Farber looks to the Greeks.

The garden however of Paradise, as it was rightly and universally believed, coincided geographically with Ararat; and the Ark finally rested on the summit of that mountain. Such being the case, both the insular peak and the once floating island would be esteemed Elysian islands, or fortunate islands, or islands of the blessed, or islands where pious souls that passed from one World to another were destined ultimately to disembark: and, partly from a remembrance of the real origin of these fabled islands and partly from the astronomical speculations which so intimately blended themselves with ancient theology, they would be styled, as we actually find them styled.

Note the allusion to the "fortunate islands, or islands of the blessed," nomenclature we encounter in Chapter 2.

Though a "pagan idolatry," Hinduism provides Farber yet more evidence in support of the Ark as a floating island.

The once insular peak of Ararat, the Hindoos call the stationary White Island the mountain of the Moon and the sea which once from its having supported the floating lunar island of the Ark, was called Luban or Laban or Alban; a title, which, in the language of those who founded Babel, jointly expresses the idea of the Moon and of Whiteness.

Here then, associated with a wonderful floating island, we have the true sacred White Island of the west, which the Brahmens rightly describe as the cradle of their theology, for here, in Paradisiacal innocence, dwelt Menu-Adima; and here was mystically born again the god Chandra or Lunus or the ark-preserved Siva from the womb of the ship Argha, which is declared to have been a form of Parvati who herself is identified with the lunar White goddess.

To the floating Lunar Island is added another that is stable, or, as the matter is sometimes expressed, the floating island itself becomes fixed, by which is meant, that the first is rooted or attached to the second.

Farber wasn't above the perpetual metaphor of a big ship as a "floating island," Chapter 47.

The vast bulk of the Ark would naturally lead to its being deemed an island. If we reckon the cubit at 18 inches, the burden of this vessel would be 42,413 tons: in other words, it was equal in capacity to 18 of our first-rate men of war.



18 First Rate Men of War

Native American Arks

Native American legends recount a great flood from which the few survivors become the ancestors of the native peoples. Following are examples in which the Native American Ark, so to speak, was a floating island.

"A Great Flood in North America", Folk-Lore in the Old Testament (1918) by James Frazer discusses lore from the Hareskins of the Northwest Territory.

The Hareskin Indians, another Tinneh tribe, say that a certain Kunyan, which means Wise Man, once upon a time resolved to build a great raft. When his sister, who was also his wife, asked him why he would build it, he said, "If there comes a flood, as I foresee, we shall take refuge on the raft."

He told his plan to other men on the earth, but they laughed at him, saying, "If there is a flood, we shall take refuge on the trees."

Nevertheless the Wise Man made a great raft, joining the logs together by ropes made of roots. All of a sudden there came a flood such that the like of it had never been seen before. The water seemed to gush forth on every side. Men climbed up in the trees, but the water rose after them, and all were drowned. But the Wise Man floated safely on his strong and well-corded raft. As he floated he thought of the future, and he gathered by twos all the herbivorous animals, and all the birds, and even all the beasts of prey he met with on his passage. "Come up on my raft," he said to them, "for soon there will be no more earth."

Indeed, the earth disappeared under the water, and for a long time nobody thought of going to look for it. The first to plunge into the depth was the musk-rat, but he could find no bottom, and when he bobbed up on the surface again he was half drowned. "There is no earth!" said he.

A second time he dived, and when he came up, he said, "I smelt the smell of the earth, but I could not reach it."

Next it came to the turn of the beaver. He dived and remained a long time under water. At last he reappeared, floating on his back, breathless and unconscious. But in his paw he had a little mud, which he gave to the Wise Man. The Wise Man placed the mud on the water, breathed on it, and said, "I would there were an earth again!"

At the same time he breathed on the handful of mud, and lo, it began to grow. He put a small bird on it, and the patch of mud grew still bigger. So he breathed, and breathed, and the mud grew and grew. Then the man put a fox on the floating island of mud, and the fox ran round it in a single day. Round and round the island ran the fox, and bigger and bigger grew the island. Six times did the fox make the circuit of the island, but when he made it for the seventh time, the land was complete even as it was before the flood. Then the Wise Man caused all the animals to disembark and landed them on the dry ground.

In Annales de la Propagation de la Foi (1852). Mgr. Tache notes the Montagnais (a tribe in the Hudson Bay Territory) belief that a great flood once covered the world, and from which four persons, along with animals and birds, survived on a floating island.

As the indigenous culture was not seafaring, an Ark, per se, may have seemed alien. Islands, however, would have been familiar formations. The missionaries would have presented their message in a way that resonated with their listeners.

The Noetic parallel may have been abetted by the recorders' theological disposition, and with conversion to Christianity, aspects of the Genesis account may have incorporated into Native American verbal tradition.

And into Recent Times

The idea of an island ark is still with us.

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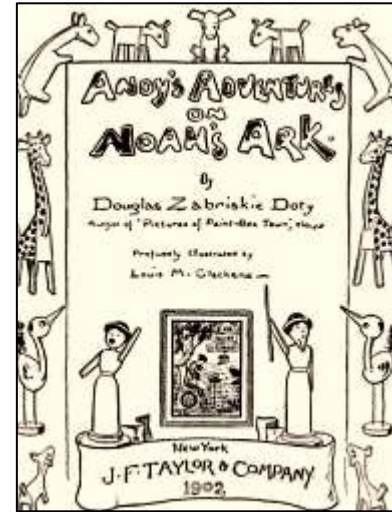
Andy's Adventures on Noah's Ark (1902) Douglas Doty

Andy glanced down at the water and noticed that it was a pale yellow, and thickish.

"I'll bet this is a custard sea!" Leaning over the edge he dipped a finger in the liquid and then put it to his lips. "

Crackyl It's good!" he cried. Everybody followed his example, and the giraffe had the best of it, because he had so much neck. The lion pulled a quill out of the porcupine, which he said worked better than a straw, and before five minutes had passed all the animals were leaning over the side of the ark sucking in soft custard through quills; all except the poor porcupine, who hadn't one left.

Suddenly there was a shock and a dull thud as the ark ran into the Floating Island. A great mass of the glistening stuff, nicely flavored with lemon, stretched out before them; and then all the animals began lapping it up or guzzling it down, each one according to his bringing up.



Everybody aboard the ark was so busy eating the floating island that no one noticed how dark it was getting. The sea had changed to its natural green color, and big billows set the ark to pitching and rolling, the motion growing more violent with every second.

Re-quoting Kaia Lehari from the beginning of this chapter,

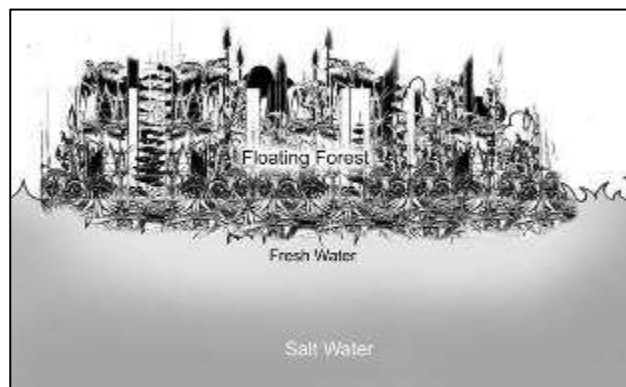
In Noah's Ark, the metaphors of the island and boat as rescuing refuges are united.

The Ark floating as a refuge above the watery chaos below is a metaphor as old as story-telling itself. Whether as inspired carpentry or fortuitous flotsam, the floating sanctuary links past to present, misfortune to fortune.

And while we were speaking of Noah Etude Sur le Mode de Formation de la Houille du Bassin Franco-Beige (Theorie Nouvelle (1885), by Ludovic Breton, hypothesizes that floating islands played a key role in the formation of the coal in the St. Omer region of France (Chapter 21). While the theory has never gained much traction on the scientific side, it's been perpetuated by Christian creationists.

In "The Carboniferous floating forest -- and Extinct Pre-Flood Ecosystem," Journal of Creation 10:1, 1996, Joachim Scheven theorizes that the *Lepidendron* and *Sigillaria* species of Carboniferous coals did not develop in place, but formed when a forest of floating aquatic plants was swept ashore and buried in Noah's Flood.

Coal began as giant club moss trees in coastal swamps, the trunks and underwater roots (*stigmara*) being radial straw-like appendices, retaining sufficient air to float the mat.



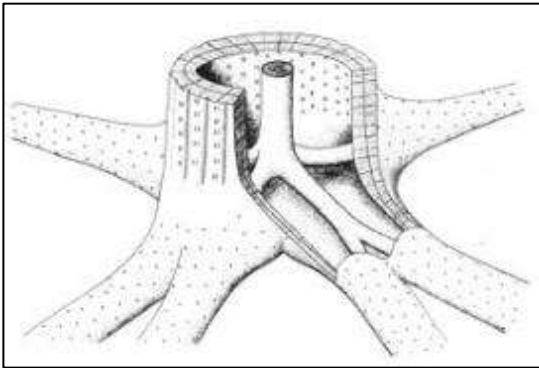
Such a floating forest would eliminate wind-and wave-driven mixing within and below the mat, stabilizing a salinity gradient of fresh, dew fall water -- an important hydrologic distinction, as it

didn't rain in the Garden of Eden -- on a salty sea, allowing both salt-and fresh-water fauna to coexist in the ecosystem. The thickness of the fresh-water layer could range from a few centimetres to several meters

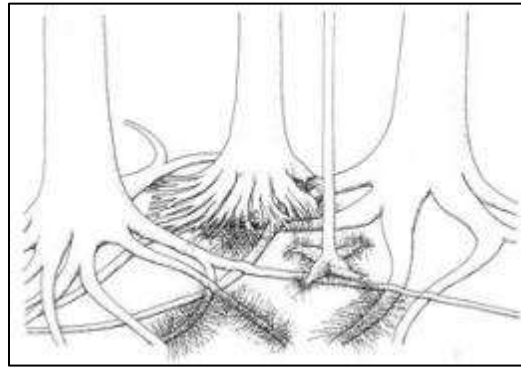
The dewfall would tend to form a film over all plant surfaces, flowing smoothly down into a film on top of the colder seawater. Shade from the floating forest would keep the seawater below cold. Evaporation would be minimal. If the root mat were dense enough, it would hold water like a sponge and yet still be buoyant, while also ballasting the floating forest above.

Shade from the floating island would tend to prevent the formation of a halocline blocking cold nutrient rich waters from reaching the surface. The colder salt water a few meters below the forest would mix freely with deeper cold water below, raising nutrients to the surface.

Fresh water in the mat would support land plants growing on a mulch of fallen leaves and appendices squeezed up above the water line. Ferns would tend to bind to together, making the mat stronger and more stable.



Lycopod tree stump hollowness between central cylinder and outer rind.



Floating lycopod forest with interwoven stigmariae and appendices

Another Creationist spin, "What Happened to Land Plants During the Flood?" Acts & Facts 28:10, 1999, by John Morris,

Some mats must have been unthinkably large, far larger than any modern peat swamp, for the coals they left behind in some cases cover entire states.

There are also many rock layers which seem to have required rather calm waters for deposition. A floating mat would have had a damping effect on even turbulent Flood waters, calming them at least locally for periods of time allowing deposition of these sediments. The mats may have been a temporary haven during the cataclysmic storm for various animals, helping them survive for weeks or even months, before finally being overwhelmed. Floating vegetation would also have been the place insects could have survived, particularly in their egg and larva stages, ensuring that they would be distributed worldwide to facilitate regrowth and pollination of plants from seeds, spores, and spores once the Flood was over.

CHAPTER 36

VISIT FISHERFOLK AND FARMERS



Sudd Dwellers

Fishing and farming are traditional livelihoods associated with floating islands, or, as we will occasionally note, islands that floated prior to affixing themselves to the bed. We'll encounter islands of natural genesis, islands created by hand, and islands natural in origin, but improved by labor.

While we touch on a broad swath of anthropology, we will find redundancy in our findings.

Lake Chad

"Journey to Lake Chad," The Times, March 17, 1959, describes a landing on one of the lake's floating islands where a half-dozen fishermen were camping in reed huts.

After one hour winding through the enchantment of the lagoon, a narrow channel appeared in the reed bank and our fishermen skillfully maneuvered the way through and there we were on the wide immensity of Lake Chad.

Floating reed islands could be seen all round and to one of the biggest we steered... At last we drew near and could see the edge of the floating island rippling up and down with the motion of the waves. We landed and found ourselves on a Kon-Tiki-like surface of tangled reeds and rushes. Water squelched up wherever we trod, and it was with some surprise that we found half-a-dozen fishermen from the lakeside village camping there. Stout bundles of reeds tied together with grass string formed four uprights over which more reeds were stretched to make a roof. A collection of cloths covered by a deer skin served as a door.

Floating islands on the eastern part of the lake support seasonal fishing camps with houses usually built entirely out of reeds.



Congo

Mary Kingsley, "Fishing in West Africa," *National Review* 29 (1897), mentions floating islands in the Ogowe and Karkola, in what at the time was the French Congo

But by no means every island gets out to sea, many of them get into slack water round corners in the Delta region of the Ogowe and remain there, collecting all sorts of debris that comes down on the flood water, getting matted more and more firm by the floating grass, every joint of which grows on the smallest opportunity. In many places these floating islands are of considerable size; one I heard of was large enough to induce a friend of mine to start a coffee plantation on it; unfortunately the wretched thing came to pieces when he had cut down its trees and turned the soil up.

And one I saw in the Karkola River was a weird affair. It was in the river opposite our camp, and it very slowly but perceptibly went round and round in an orbit, although it was about half an acre in extent. A good many of these bits of banks do not attain to the honor of becoming islands, but get on to sand-banks in their early youth, near a native town, to the joy of the inhabitants, who forthwith go off to them, and drive round them a stockade of stakes firmly anchoring them. Thousands of fishes then congregate round the little island inside the stockade, for the rich feeding in among the roots and grass, and the affair is left a certain time. Then the entrance to the stockade is firmly closed up, and the natives go inside and bail out the water, and catch the fish in baskets, tearing the island to pieces, with shouts and squeals of exultation. It's messy, but it is amusing, and you get tremendous catches.

Edward Hodgson's Fishing for Congo Fisher Folk (1934) is a missionary's account of native life on the floating islands of Lake Kisale in the Congo.

Let us picture the lake towards the end of the dry season, when rain has not fallen for six months, and the water level has been going lower and lower each day, the surface getting more and more covered by the water lily leaves. The floating islands float no more but are firmly anchored in the mud of the lake bottom.

Floating islands of vegetation can be seen in the lake-shore satellite image; the larger ones some 500 meters in dimension.



Uganda

Uganda's 4000-square-kilometer Lake Kyoga reaches a depth of about 6 meters, and most of it is less than 4. Areas less than 3 meters deep tend to be completely covered by water lilies, while much of the swampy shoreline is covered with papyrus and water hyacinth. The papyrus also forms floating islands that drift between small permanent islands.



Half a million people live on the shores and some on the floating sudds, relying on the lake for their livelihood.

"Chaille Long's Work on the Nile," Bulletin of the American Geographical Society 36.6 (1904) mentions the island fishing industry.

On the floating islands formed of the detritus of papyrus the inhabitants of the lake have constructed huts, whence on our approach, they fled in their rude pirogues. The huts, made of the stalk of papyrus and bamboo, were filled with a quantity of rotten fish, which rendered the air pestiferous.

Chapter 22 describes the sudd of Africa, but let us here note E. Barton Worthington's remarks in "The Life of Lake Albert and Lake Kioga," Geographical Journal 74 (1929) regarding the Bukenyi and Buruli tribes who inhabit Kyoga's floating isles

Very few parts of the shore-line are free from a fringe of floating papyrus and other swamp vegetation. The width of this fringe varies from a few yards along the more exposed shores, to several miles where the bays and river mouths are entirely choked with sudd. This condition leads to an abundance of floating papyrus islands in the open water during windy weather, as parts of the shore fringe are blown out into the lake. In addition to the winds, floods sometimes sweep large masses down the rivers, so that the distribution of the sudd is always varying. This may lead to blocking of the watercourses.

Certain Buruli tribesmen however, in order to be nearer their fishing grounds, have adopted to some extent this floating mode of life of the Bukenyi. Several floating villages of these people were visited in the sudd area, which is intersected by a complicated maze of water channels, at the point of junction between Kioga and Kwania.

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According to information obtained from these folk, the women are left upon the mainland, but the men live afloat for some three months at a time, feeding exclusively on fish and water-lily tubers, taking their store of dried fish ashore at intervals for sale.



Buruli fishing village on sudd of Lake Kyoga

Worthington offers more on the subject in Inland Waters of Africa, The Result of Two Expeditions to the Great Lakes of Kenya and Uganda, with Accounts of Their Biology, Native Tribes and Development 1933).

Down the west coast is a large clearing with patches of papyrus-free shore; the men and time involved in this clearing work under the S.S. restrictions must be very considerable, but it has resulted in making Kisenyi methods of fisherman and hunter; each is perfectly adapted, physically and mentally, to his own ends.

In the depths of Lake Kioga's papyrus swamps there is a tribe called the Bakenyi, and another group of people called Baruli, who are usually regarded as originally part of the great Banyoro tribe, driven to the water by their neighbors. These people beat down patches of the floating papyrus swamp and build their rude huts of grass and reeds upon it. Walking in their villages the foot sinks at every step into the squelching mud, and water oozes up to the ankles. These people truly live a floating existence, for sometimes the patch of swamp which they have made their habitation may be swept away as a floating island by wind or current, to fetch up and become anchored on some remote part of the shore. The fishermen, characteristic of their kin throughout the world, are not worried by such incidents, but, taking their canoes with them, quietly continue their fishing in any part of the globe to which chance may take them.

When they have caught and dried sufficient supplies of fish, they betake themselves to the mainland and barter their store among the pastoral sections of the community. They convert their wealth so gained into goats, cattle and wives, and settle down to a life of idleness and luxury for a time. When need calls once more, off they go to their floating islands to fish, leaving wives and stock in charge of some friendly village.

Bringing us into modern times, "Life on the Sudd: The Floating Isles of Lake Kyoga," East African, January 17, 2000, reports on the 6,000 then living on the lake's floating islands

Onyango is one of the thousands of people living on the floating islands, or "suds", in Uganda's Lake Kyoga. Isolated and remote, the suds are among the most striking marvels of nature to be found in Uganda. They occur in large numbers at two points in the Nile basin. Apart from Lake Kyoga in central Uganda, the other well-known suds are found in the Bahr-el-Ghazal region of southern Sudan.

From the shore to the suds is a four-hour journey by canoe, or one hour by motor boat. The journey starts at four in the morning. An hour and a half later, the suds appear as a blurred silhouette on the horizon. But it is still dark and in the distance, beacon fires lit on the islands flicker on and off.

By the time we approach the first suds, it is past eight o'clock. In the bright morning light, their beauty is striking. The water is calm and glassy. The papyrus is a brilliant green, and casts clean-edged reflections in the water. Tree trunks bob along, bleached white. Long-legged birds, resplendent in bright colors, bask in the sun on their branches, swooping on small fish and insects.

Chapter 36 -- Visit Fisherfolk and Farmers

But difficult times were arriving. From "3,000 IDPs Ordered to Quit Floating Islands on Lake Kyoga," [Africa News Service](#), January 6, 2004,

Government has directed immediate evacuation and resettlement of over 3,000 internally displaced persons living in four floating islands on Lake Kyoga.

State Minister for Disaster Preparedness and Refugees Christine Amongin issued the directive on Sunday at Lela floating island on Lake Kyoga.

"The Government has known and has seen that you are suffering. But now I have to speak authoritatively on behalf of the Government that you must leave these floating islands in order to avert a disaster," Amongin said.

It seems, however, that the intervention wasn't successful. "Living on Kyoga's floating islands," [NewVison](#), April 29, 2007, brings us somewhat up-to-date on the plight of the fishing community.

They live in potential danger, but they are not bothered. All that matters to them is enjoying life, which, to them, includes not paying taxes, lawlessness and the availability of money. These are the fishermen who live in the suds (floating islands) in Lake Kyoga.

A two-hour boat ride from Kikooge landing site in Nakasongola leads you to Kikooge suds, one of the largest occupied floating islands in the middle of the lake.

Papyrus reeds are used to construct makeshift structures for the island dwellers, who district officials estimate to be over 3,000.

The floating islands are home to the people who claim to have "black blood" and are resistant to drowning.

The residents build their houses using reeds. The roofs are waterproof but not humidity resistant. Cooking fires are built on a layer of stones to protect the reeds. Papyrus is used to support the top layer, which rots and must be replaced regularly by stacking more reeds on top of the layer beneath.



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1986



2002

The Kyoga system is characterized by large fluctuations in lake levels, water surface areas, and flora and fauna, and consequently, adaptation by those who depend upon the waters for sustenance.

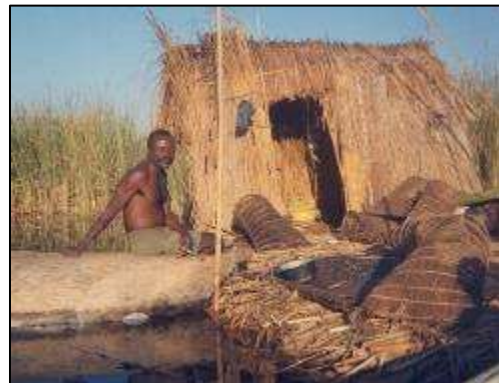
"A Floating Village in Central Africa," *Elyria Chronicle*, April 18, 1907, takes us to Lake Albert Edward.

A British exploring party in central Africa recently found a tribe of lake dwellers, a small community of natives who spend their whole lives on Lake Albert Edward. Their houses are built on floating platforms anchored to long poles thrust into the bottom of the water. The huts are of grass curiously interwoven. There are several of these villages, one of them containing over thirty huts.



Malawi

Typha blankets roughly a third of Malawi's Lake Chilwa. Fishermen sleep, eat and bathe in the marshes, fashioning reed huts for temporary dwellings. As the fishermen drink the water from one side of the island and use the other side as a toilet, cholera outbreaks affect half the inhabitants. Like the situation on Lake Kyoga, authorities attempted to ban fishermen from residing on the floating islands, even burning some of the camps, but the prohibition proved ineffective.



From "The Use of Fishers' Knowledge in the Management of Fish Resources in Malawi," by Kyoga in Putting Fishers' Knowledge to Work, Nigel Haggan, Claire Brignall and Louisa Wood, eds. (2003),

Lake Chilwa fishers use zimbowela (floating islands) in their fisheries... Fishers of Lake Chilwa use floating manjedza to make a platform on which they build a temporary hut. These structures, called "zimbowela," can be built as a deliberately planned fishing camp or temporary shelter when stranded in a windstorm.

Given the two translations, "zimbowela" would seem to indicate a floating island supporting a fishing camp.

Zambia

Lukanga Swamp is a wetland in central Zambia in having an arc of permanent islands along its higher western edge. Within the swamp, floating islands of papyrus support seasonal fishing camps.



Germany

The Earth and Its Inhabitants: Austria-Hungary, Germany, Belgium, and the Netherlands (1878)
Jean Reclus, Augustus Keane, north of Bremen,

The Hamme River... traverses a marshy tract which in many respects is one of the most remarkable in Europe, for the spongy soil, though cultivated in many places, still floats upon the surface of the water. When the snow melts, and the Hamme and the numerous swamps in its basin become overcharged with water, much of the lowlands of Waakhusen and St. Jorgen is actually uplifted by the flood. The remainder, being firmly attached to the bottom of the morass, is inundated, sometimes to a height of 10 feet. Occasionally the inhabitants are forced to fly from their dwellings erected on the most elevated sites afforded by the "solid land," and seek refuge on their "floating fields." After having been cultivated for a number of years the spongy soil loses its power of floating, and definitely settles down upon the bottom -- an event very much regretted. High winds are an enemy much dreaded by the cultivators of floating islands; for they uproot trees, and sometimes drift the land upon which they grow far out into the swamp.

Italy

Silvestri, Domenico's De insulis et earum proprietatibus, (c 1400) reports that floating islands in Tuscany's Lago di Bientina, a.k.a. Lake Lucchese, had fishing huts built on them,

Most of the lake was drained in 1859 by a siphon under the Arno.



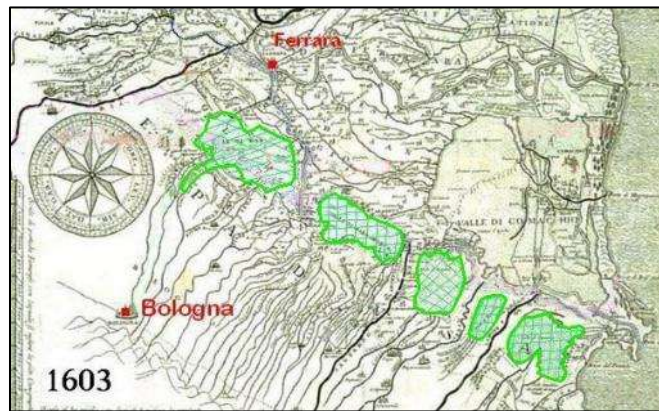
The Agro Ferrariensi in Italy has long been farmed. Mention is made of its floating islands in:

Niccoli Cabeo, In Quatuor Libros Meteorologicorum Aristotelis Commentaria (1646)

Giovanni Riccioli, Almagestum Novum,

Astronomiam Veterem Vovamque Complectens (1651)

Geminiano Montanari, Il Mare Adriaticoe Sua Corrente... et la Naturalezza dei Fiumi (1684)



Marshes and swamps, 1603

In A Treatise on Rivers and Torrents (1818), Paolo Frisi notes,

I have also observed, in the valleys of the Bolognese, another kind of shaking and moveable ground, which forms in the middle of the waters, appearing like so many floating islands, and commonly called cores.

Sometimes the reeds of the marshes produce, at the spot where they grow, an abundance of roots, which, at the end of some years, become so thick and interwoven, that, as the little fibers, by which they are fastened to the bottom, begin to decay, the whole mass of earth which they contain having become specifically lighter than the water, is detached from the bottom, rises in large portions, and floats on the surface; which, however, does not prevent the cores from producing new reeds, as if they were still occupying their former place at the bottom; because the substance of the old roots contained in the floating masses supplies them with sufficient nourishment in this manner they continue for several years to produce fresh herbage, and sometimes they grow so large as to bear cattle, sportsmen, and cottages, and are the admiration of all those who come to see them.

I have, in the valley of Duiglio, been upon one of these cores which was upwards of half a mile in circumference; its thickness was about three or four feet, and below these there was a depth of more than twenty feet of water.

The marshes have since been reclaimed.

Holland

Emile de Laveleye's La Neerlande (1865) mentions floating islands of Friesland (Chapter 78) on which potatoes are cultivated.

Finland

Sidney Powers, "Floating Islands," Bulletin of the Geographical Society of Philadelphia 12 (1914) citing G. Anderson, Om Flott-tegar (1898),

Similarly in Finland portions of certain bogs are ditched into rectangles for cultivation, and in spring some of these are often raised by ice and high water and carried over upon the other portions.

Slovenia

Johann Valvasor, Die Ehre des Hertzogthums Crain (1689),

The region of the Crain between S. Marain and the city Weichselburg can settle this dispute as to whether some islands float through visible experience and daily evidence. For there is a large pool or pond that belongs to the cloister of Sticna, and on this same pond, a rather large piece of earth moves around, upon which some little trees stand, and much hay grows. Each year more than a cart-load of hay is harvested from the island. This little piece of land drifts around on the water and does not sink to the bottom. Many years ago this floating island often drifted down to the pond's outlet, which is why one often needed to push it to the sides of the pond, until finally about fifty years ago this island was pulled near the top of the pond and tied in place. From that time until now it still remains thus tied in place.

France

If we count tree farmers as farmers, we've "Note sur les Iles Flottantes de l'Etang de Vallieres," Memoires de la Societe des Sciences Naturelles de Seine-et-Oise (1835), by Charles Lacroix. The largest floating island was 120 feet long; willows and alders were harvested from the islands every nine years.



Iraq

The Marsh Arabs of Iraq's Tigris-Euphrates marshlands of south-eastern Iraq and along the Iranian border traditionally dwell in arched houses on artificial islands of reeds called "jabysa." Despite their appearance, however, the islands are "floating" only in their start-up when reed and sedge is bundled to form a floating. Sediment is excavated from the surrounding marsh and heaped onto this platform, which is then covered with further layers of reed and sedge until the desired elevation is achieved and the mass is sufficiently solid. Pillars 1 to 2 meters apart from the foundations of the dwelling.



Livelihoods include fishing, husbandry of sheep, cattle, and domestic buffalo, cultivation of rice, barley, wheat and pearl millet and reed-craft. As a result of the government's drainage of the area in the 1990s, however, less than 2,000 locals now reside on these islands,

From Marsh Dwellers of the Euphrates Delta (1962) by Shakir Mustafa Salim,

Villages are comprised of from 100 to 300 huts. Villages are scattered along the edge of the main waterways and over cultivated lands.

Secondly, a mound, ishdn, is an island in the permanent marshes usually taken as a residence either by the reed-gatherers or the buffalo-breeders. A mound settlement is usually composed of a number of huts lightly constructed with reeds or bulrushes. The number of huts varies from 30 to 40 on the small mounds, to 500 on the larger ones.



Thirdly, in the flood season the buffalo-breeders make a raft or floating platform (id-dibun) of reeds, bulrushes and earth. It is large enough to hold a hut, or a few buffaloes, and can be poled from place to place and used as a temporary residence. A group of such rafts may form a settlement which sometimes even has its own shop.

As buffaloes are strong and fierce, they have to be kept on separate floating platforms rather than on the islands of the village where they would damage the huts and the date palms, or cause inconvenience by wading through the narrow waterways.

Lastly, reed islands (chibayish) are raised during the high-flood season by layers of bulrushes, reed and earth, and are used as residences.

Local lore, as recorded by Wilfred Thesiger in The Marsh Arabs (1964),

"Have you ever heard of Hufaidh?" our host asked me.

"Yes, but tell me more about it."

He waved towards the south-west. "Hufaidh is an island somewhere over there. On it are palaces, and palm trees and gardens of pomegranates, and the buffaloes are bigger than ours. But no one knows exactly where it is."

"Has no one seen it?"

"They have, but anyone who sees Hufaidh is bewitched, and afterwards no one can understand his words. By Abbas, I swear it is true. One of the Fartus saw it, years ago, when I was a child. He was looking for buffalo and when he came back his speech was all muddled up, and we knew he had seen Hufaidh."

Chapter 36 -- Visit Fisherfolk and Farmers

Sadam said, "Saihut, the great Al bu Muhammad sheikh, searched for Hufaidh with a fleet of canoes in the days of the Turks, but he found nothing. They say the Jinns can hide the island from anyone who comes near it."

I made some skeptical comment, but Sadam said emphatically,

"No, Sahib, Hufaidh is there all right. Ask anyone, the sheikhs or the Government. Everyone knows about Hufaidh."



A floating platform with hut and buffaloes

A floating platform poled by two men

As observed by Gavin Maxwell, in People of the Reeds (1957),

Gradually the channels grew wider and less distinguishable, until we were moving through open blue lagoons fringed and islanded with giant golden reeds growing dense and twenty feet high. They were as ripe standing corn must appear to a mouse, huge and golden in the sun, with only a tiny fringe of new green growth in the blue water at their feet. As yet there were so many islands that it was easy to find shelter; they were dense and solid-seeming and only their very tops bent under the gale that urged them majestically over the water, for most of these islands are unanchored, and drift slowly about the lagoons as calved icebergs drift in polar seas.

Our island was perhaps fifteen paces across, a jungle of giant reeds and bramble undergrowth, and it drifted sluggishly across the blue lagoon, slowed to a snail's pace by its soggy sea-anchor of roots and turf.

Iran

Megard, Robert, "Late-Quaternary Cladocera of Lake Zeribar, Western Iran," Ecology 48.2 (1967),

The lake is 4 km long and 1.5 km wide, exclusive of the broad marsh and sedge mat that surround the open water... The water was probably nowhere deeper than 5.5 m... In the spring of 1963 the inner edge of the marginal sedge mat floated freely in several meters of water. Fragments of it as large as 50 m² in area were torn away by severe storms to become floating islands, which drifted across the lake until they were blown against another shore.



Fisherman's hut on floating island

India

The floating islands Kashmir Valley are formed chiefly by the compact mats of *Typha angustata* and *Cladium mariscus* loaded with clay. Some of the skeleton, however, may be artificially made up of long reeds of *Phragmites communis* which is abundantly available around the lakes. Even experts find it difficult to differentiate one from the other.

Kashmir's Dal Lake covers 18 square kilometers, including its floating gardens which blossom with lotus in late summer.

King Jainollabhadina, who reigned 1420-70; is said to have made floating islands of Dal Lake fruitful by depositing grass and earth on them, indication that the islands already existed at that time. Olfert Dapper mentions floating islands located near Baramula, probably Dal Lake, in his Asia; oder, Ausfiihrliche Beschreibung des Reichs des Grossen Mogols (1681).

Today, the floating islands of Dal Lake are intensively farmed for watermelons, melons, cucumbers and tomatoes

The farmer locates a dense stand of cat-tail rushes, scythes away the greenery, separates the root mass from the lake bottom with a shovel, and cuts off a floating strip 1 to 4 meters wide and 15 to 30 meters long. The strip is towed to the desired location and anchored to the bottom by willow or poplar poles. Earth from the mainland is used to level the surface and lake-bottom mud and aquatic plants are heaped upon the island to thicken it. Plantings are made in concavities on top of the mounds



William Urwick, India Illustrated with Pen and Pencil (1891)



1895

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1899



Today

A few comments from the 19th century:

William Moorcroft and George Trebeck, Travels in the Himalayan Provinces of Hindustan and the Panjab, in Ladakh and Kashmir; in Peshawar, Kabul, Kunduz and Bokhara (1841),

Though the narrow beds are ordinarily almost in contact by their sides, yet, by their flexible nature, they are so separable that a small boat may be readily pushed between the lines without injuring their structure, and, for the most part, they will bear a man's weight, but, generally, the fruit is picked off from the boat.

"Floating Islands," Chambers' Journal of Popular Literature, Science and Art, August 29, 1874,

The floating gardens of Cashmere are constructed like those of Mexico, but are far less beautiful, because they produce no trees or flowers, but only vegetables for the table.

Arthur Neve, in Picturesque Kashmir (1899),

The process is as satisfactory as it is simple and economical; no watering is required, for the roots stretch down into the lake.

Such agriculture isn't "simple and economical" in the long run, however. In "Impact of Floating Gardens on the Limnological Features of Dal Lake," Pollution Research 15.3 (1996), S.G. Sarwar, A.R. Naqshi and G.R. Mir establish that the waters in the region where floating gardens are cultivated are more eutrophic than other parts of the lake.

Ten years earlier, Hanifa Bano, in "Economic Exploitation by Way of Agriculture in Dal Lake (Srinagar)," Annals of the National Association of Geographers, India 6.1 (1986), cited already recognized the lake's decreasing agricultural productivity and suggested the removal of some floating gardens to improve water quality.

"Phumdis," heterogeneous masses of black, humic soil, vegetation and organic matter, often dominated by reeds that grow up to a height of 5 meters, cover as much as 70 percent of the 290 square-kilometer Lake Loktak in northeastern India. Phumdis vary in thickness from a few centimeters to several meters. In the dry season, they sink to the lakebed where they gather nutrients. After spring rains, they resurface.



More than 40 square kilometers of phumdis lie in Keibul Lamjao National Park, preserve home to more than 100 endangered Manipur brow-antlered deer, locally known as "sangai" or dancing deer" due to the gait necessitated by the soggy footing.

Habitat is threatened by the encroachment of humans and livestock, annual burning of the phumdi, and the Loktak Hydroelectric Project, which prevents the phumdi from settling to the bottom in the dry months, increasing erosion from their lower surfaces and thus making them thinner over time.



This lake serves as a source for hydropower generation, irrigation and drinking water. Plant species associated with phumdis are utilized for food, cattle fodder, fuel, thatching and hut construction, fencing, human and veterinary medicines, handicraft materials or cultural purposes.

Fish farms are constructed pieces of phumdi into a ring of 200 meters in diameters. The island is surrounded with nylon netting that reaches to the lake bed and then silt is stirred with bamboo poles to deoxygenates the water and bring the fish to the surface, where they can be easily caught.



Phumdis have proliferated, probably because lake impoundment, prevents dispersal of disintegrating islands downstream. Environmental problems include siltation, eutrophication, loss of fish biomass and diversity, and, ironically, loss of the hydraulic head available for power generation. Sustainable management may require selective removal of phumdis and/or harvesting them for compost.

Another tactic for sustainability has involved the removal of people. The provincial government has burnt many of the 1300 floating huts on the "no development zone," the "totally protected zone" and a buffer zone of other areas of the lake, an action effecting 10,000 floating island dwellers. Each household was offered 40,000 Indian Rupees (approximately \$900) in compensation.

The plight of the inhabitants brings to mind a similar story a few pages back regarding Uganda.



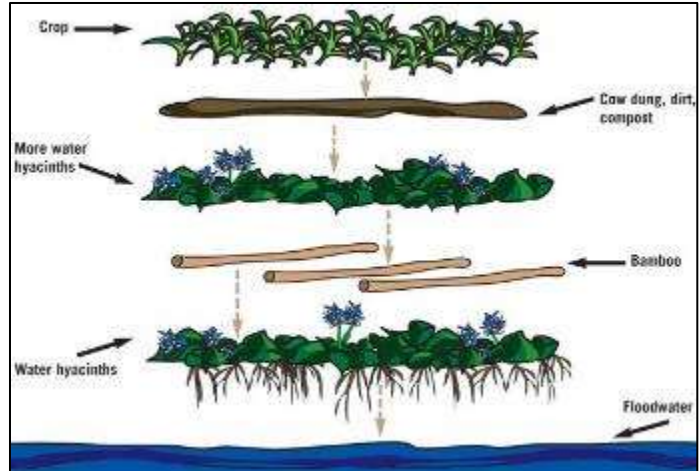
But as tourists; we're better accommodated. To the right, an approved class of housing, a guest house on a Loktak phumdi.



Bangladesh

Floating farms are still very much part of Bangladeshi agriculture.

To the right, instruction for construction, unchanged from the practices of centuries past.



Below, photographs of floating island farming.

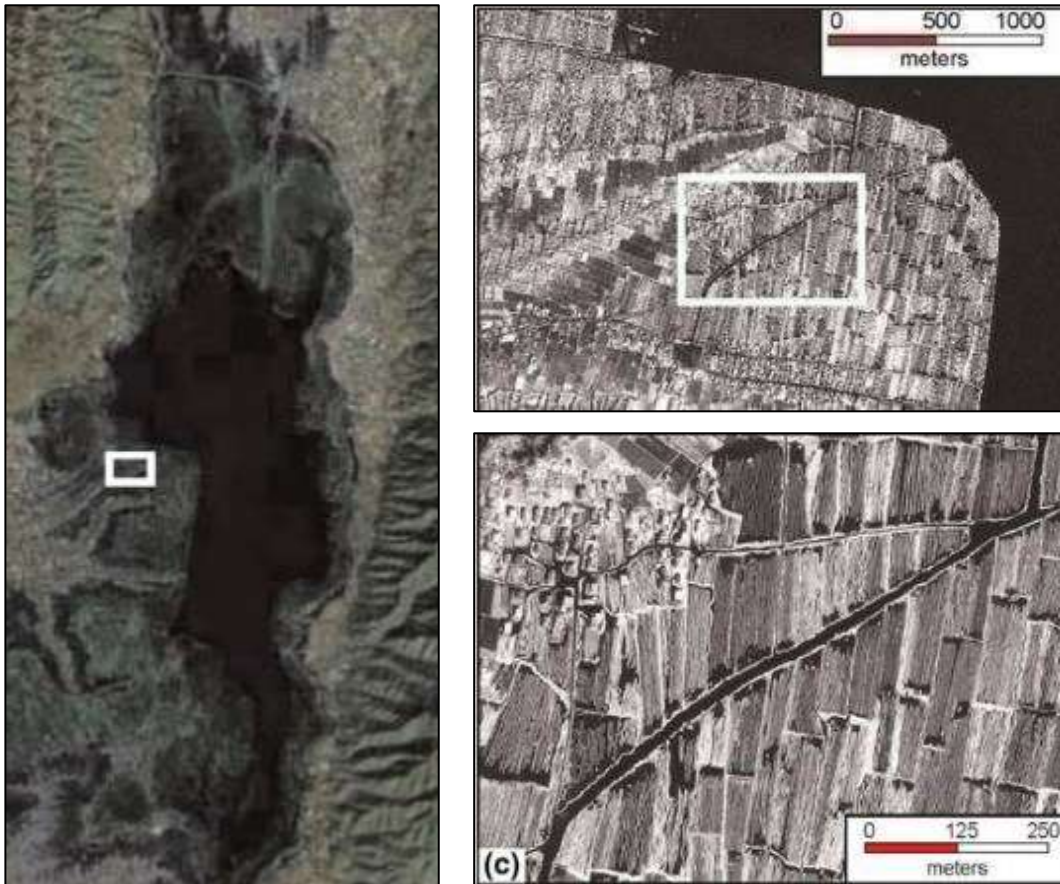




Burma

Burma's Inle Lake is surrounded by dense thickets of elephant grass, known locally as "kaing." Blocks of kaing-bound soils, 2 by 40 meters in area and 1 meter in thickness, are cut and dragged by boat to the lake margin where they are staked by bamboo poles. Placed about 2 meters apart with the upper surface 10 to 20 centimeters above the water, tomatoes are the principal crop, along with beans, cucumbers, onions, garlic and flowers. Once hardened, the islands can be cut, and even be sold like a piece of land.

The maps below are progressively zoomed.



While the floating islands of Inle are well noted for their agriculture, "Yule on the Geography of Burma and its Tributary States," *Journal of the Royal Geographical Society* 27 (1857), points out that the platforms were also used for fishing.

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The principal feeder of the lake is the Borathat, a stream flowing down from the mountains immediately east of Ava. The surface of this lake presents the singular spectacle of a multitude of floating islands. They are composed of the interlaced roots of a coarse grass or reed, loaded with a little soil. The roots of the grass shoot down to the bottom of the lake in dry weather, but in the rains many of these entangled masses are buoyed up and separated from the ground so as to be quite afloat.

The inhabitants often occupy them as fishing stations, or even erect their cottages on them, anchoring the islands to the bottom by long bamboos. They undulate at every step, and a man's house, some times during a squall, changes front to every point of the compass. Some of these islands are so large as to afford space for three or four cottages.

Footnoted,

A very fat old woman on one island, where we landed for breakfast, laughed heartily at some apprehension displayed by one of my people, who was about half her weight, that he might go through.

A Supplement to the Imperial Gazetteer; a General Dictionary of Geography, Physical, Political, Statistical, and Descriptive (1868) repeats the fishing report, adding a photo.



"Introductory Account of the Inle Lake," Records of the Indian Museum 14 (1918) by N. Annandale adds an interesting detail: in construction, the floating mats are flipped over.

When a cultivator wishes to grow tomatoes, cucumbers, or indeed any kind of vegetable, he cuts off a piece of a floating island sufficiently large to form his field, and then ties a rope to it and tows it to a suitable situation. The next operation is to turn the island upside down, which is easily achieved as its equilibrium is by no means stable, to anchor it with a bamboo pole thrust through it into the bottom of the lake and then to pile up more peat from the bottom upon the exposed surface until it becomes solid enough for him to walk upon, and even to build a house or erect a pig-sty. The gardens thus formed are extremely fertile.

"Myanmar's Inle Lake is Home and Market for Floating Farms and Thousands of Semi-Amphibious People," Seattle Times, August 29, 1999, informs us that the method of farming has not much has changed.

When he goes out to weed his tomato patch, Myo Win takes a boat.

There's no solid earth for the vegetables to take root in or for Myo Win to walk on. The vines grow on a floating plantation in the middle of Inle Lake. To tend them, Myo Win paddles between the rows in his teak canoe.

Myo Win is one of thousands of farmers, fishermen, merchants and monks who live as semi-amphibians on Inle Lake, a placid water world set in picturesque mountains 4,300 feet above sea level in rugged Shan State, northeastern Myanmar.

Flat as glass and mostly shallow, Inle Lake's waters provide rich fishing grounds and floating farmland for people dwelling in thatch and bamboo houses built on stilts in villages above the water.

From a large floating island, farmers cut strips and tow them back to their individual plots, lay them out in rows and fix them to the lake bed with bamboo stakes.

The self-irrigating farmland and cooler climate -- at least for tropical Myanmar - combine to produce flowers, cauliflower, cabbage, beans, melons and strawberries.

Underwater weeds grow profusely. Myo Win spends several hours a day dragging them up between the tomato rows with a pole until his 40-foot canoe is piled high.

Four times a week, Myo Win paddles his load of weeds to markets along the 15-mile-long lake and sells it to shore farmers for fertilizer. Price: 300 kyats, or about 80 cents.



Inle's agricultural future may be bleak, however. Minimally-regulated agricultural and industrial pollutants endanger water quality. Once a floating plot's fertility is exhausted, normally in about a 3-year period, the floating gardens is transported to another shore, further diminishing the open water. From 1935 to 2000, the net open water area of the lake decreased by a third.

China

Chinese history of rice cultivation on artificial floating islands extends back 1600 years. Mats formed by twisting together rhizomes and gausun grass were placed on wooden frames and set to float as rice beds for zizania rice. These artificial floating islands were particularly popular during the Tang Dynasty (618-907) and the Song Dynasty (960-1127) in rivers, lakes and marshes south of the Yangtze.

Use farming the floating islands declined as the habitats in which zizania grew well were progressively damaged due to rapid population growth.

Western writers have long reported a floating island on Lake Dongting in Hunan Province, the largest natural freshwater lake in China.

A "floating village" on Lake Dongting, as illustrated in Erasmus Francisci's Ostt und West Indischer wie auch Sinesischer Lust und Stats Garten (1668).

The urbanized appearance suggests that the community was more likely on the waterfront than truly floating, but it's instructive that Francisci thought the former.



Adam Preyel, Artificia Hominum Miranda Naturae, in Sina & Europa (1655) and Chevalier de Mailly, Principales Merveilles de la Nature (1745) add that there was a monastery built upon a

floating island in Lake Dongting, but the two may well have been influenced by Herodotus's account of a floating island at Chemmis (Chapter 1).

Currently there are rocky islands in the lake, but none floating.

Jean Baptiste Grosier, De la Chine, au Description Generale de cet Empire (1818-20), believed the island to be a twisted mass of roots, with reeds and trees growing on it.

"Late Apostolic Missionary" Evariste Hue, The Chinese Empire (1859) noted with some detail a constructed island in Lake Ping-hou, Hubei Province, likely the ex-Lake Baihu, drained and converted to farmland in the 1960s.

A comment regarding the lake excerpted from "Chinese Floating Islands," New York Times, February 17, 1867,

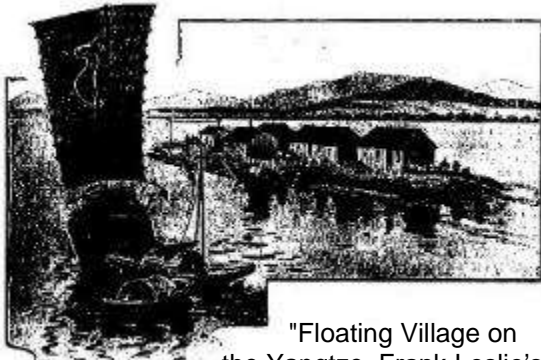
These floating islands are enormous rafts, generally constructed of bamboos, which resist the decomposing influence of the water for a long time. Upon the raft is laid a tolerably thick bed of vegetable soil; and, thanks to the patient labors of a few families of aquatic agriculturists, the astonished traveler beholds a whole colony lying on the surface of the water -- pretty houses with their gardens, as well as fields and plantations of every sort.

The inhabitants of these floating farms appear to enjoy peace and abundance. During the leisure time which is not occupied by the culture of their rice-fields, they employ themselves in fishing, which is at the same time a pastime and a source of profit; and often, after gathering a crop of grain from the surface of the lake, they cast their nets and bring up a harvest of fish from its depths; for these waters team [sic] with creatures fit for the use of man. Many birds, particularly swallows and pigeons, build their nests in these floating isles, and enliven the peaceful and poetic solitude. Towards the middle of the lake we encountered one of these islands on its way to take up a fresh position. It moved very slowly, though there was a good deal of wind, and large sails were attached to the houses as well as to each corner of the island: the inhabitants, men, women, and children, lent their strength to aid its progress, by working at large oars.

"Chinese Floating Gardens," Scientific American, November 9, 1889 summarizes an article by D.J. MacGowan which originally appeared in China Review.

*In the month of April, a bamboo raft, ten to twelve feet long and about half as broad, is prepared. The poles are lashed together with interstices of an inch between each. Over this a layer of straw an inch thick is spread, and then a coating two inches thick of adhesive mud taken from the bottom of a canal or pond, which receives the seed. The raft is moored to the bank in still water, and requires no further attention. The straw soon gives way and the soil also, the roots drawing support from the water alone. In about twenty days the raft becomes covered with the creeper (*Ipomaea reptaozs*), and its stems and roots are gathered for cooking.*

Besides these floating vegetable gardens there are also floating rice fields. Upon rafts constructed as above, weeds and adherent mud were placed as a flooring, and when the rice shoots were ready for transplanting, they were placed in the floating soil, which being adhesive and held in place by weed roots, the plants were maintained in position throughout the season.



"Floating Village on the Yangtze, Frank Leslie's Popular Monthly, September 1891



"Floating Village, China," The World: its Cities and Peoples (1892) by Edwin Hodderl. .

"China's Floating islands," McCook Tribune, August 15, 1911,

On all the great lakes of China are found floating islands which are enormous rafts of bamboo overlaid with earth and bearing on the surface of the water pretty houses and gardens. They are, in fact, aquatic farms, bearing crops of rice and vegetables. The rich bottom mud, utilized as an artificial soil, is extremely fertile and yields bountiful harvests, though on a small scale.

In a country where there is a lack of available land, the floating plantations are most serviceable, large sails being attached to the dwelling house as well as to each corner of the island whenever it is desired to move about. After gathering a crop of grain or garden produce from his farm, the floating farmer casts his nets into the water and from their depths brings up a supply of fish for his family.

Taiwan's Sun Lake and Moon Lake originally were two separate but connected lakes containing numerous clumps of intertwining grass and soil, some large enough to support two people. Trees and plants caused them to be called "floating paddies." The islands frequently drifted to the lake center under the southwest wind.



When the lakes were dammed in 1934, the two lakes united to form one, 21 meters higher. All but one floating island was dragged ashore, the one remaining being fixed in position to not block water flows. Today's "floating island in the pearl lake," Lalu Island, is the crest of a hill submerged when the water level was raised

Rice aquaponics growing on fish pond, China



Before 1934, the aboriginal Thao people placed containers along the floating islands to catch the small fish, qili (*Cultricus kneri*). After the elimination of the islands, the Thao constructed artificial ones by planting soil and grass on bamboo rafts

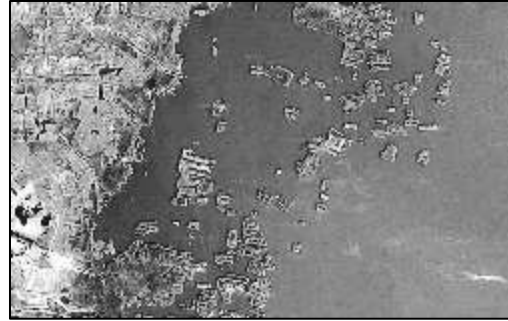


While floating farms but a minor role China's modernized agriculture productivity, the tradition carries on in an artful manner, as exemplified by the Floating-Gardens of Yongning-River-Park in Taizhou.



Madagascar

Phragmites dominate the floating islands of Lac Itasy. While the masses may have their origins as floating reeds, they've long been converted into stationary, farmable bodies used for rice cultivation.



Thailand

Soccer in the fishing village of Ko Panyi.



The Philippines

Lake Buluan, Mindanao, flows to the Liguasan Marsh, 40 kilometers long and 30 kilometers wide, along the Pulangi River. Three reports from the American occupation follow.

Report to Adjutant-General, United States Army, Philippines Division, January 1902, by R.C. Van Horn,

Our route was through the Buluan River connecting the two lakes. The entrance to the river from Lake Buluan was not more than a meter wide on account of being choked up by floating islands of grass, but it widened out to about forty meters for about 5 kilometers. It was hard to distinguish the river from the numerous esteros. After 7 kilometers we came to some solid ground on the left bank where there was a tiangi or market. After this we could see no solid ground on either bank until I reached the Rio Grande.

Entered Lake Liguasan about 1 P.M. The lake was very much the same as the surrounding country, a few patches of open water, large floating islands, and the rest covered with lily pads and water cabbages. A small channel was made by boats cutting their way through. The character of the lake changes with every wind.

The Gems of the East, Sixteen Thousand Miles of Research Travel among Wild and Tame Tribes of Enchanting Islands (1904), by Henry Landor,

Through intricate channels we eventually emerged into more open water, a fine and most poetic lake with floating islands upon it. The principal island is called Bang -- a most extraordinary place, one-third of a mile in diameter, with people living upon it and with houses, trees, and agriculture. This island shifts its position to the south-west side of the lake during the north-east monsoon, and moves over to the north-east side during the south-west winds, and when the monsoons are about to change, and the winds are capricious it is all the time on the move upon the surface of the lake. When you walk upon it you have to walk pretty lightly and be careful where you put your feet, or you go right through the island into the water below, but otherwise it is an enchanting place.

Chapter 36 -- Visit Fisherfolk and Farmers

Several fishermen have houses with nice fields of maize on the island of Bang, and they fly a red flag upon a high mast above their houses as a signal to their friends and traders who would otherwise have some difficulty in finding exactly where the island has gone.

The bottom of the lake was composed of decayed vegetation, and was only a few feet below the surface. When the paddles stirred it, its substance rose in dense clouds to the surface, and its stench well above the surface.

The formation of these floating islands seems to arise from the settling of organic matter between the lotus-plants and this, as it accumulates, solidifies in the heat of the sun. The stems of leaves and flowers becoming decomposed at the roots, the leaves gradually accumulate on the surface, and owing to their fibrous qualities interweave and form a kind of natural matting. Centuries of such accumulation, the addition of earth blown by the wind and the abundance of guano, easily explain the formation of these strange islands.

"Field Service in Mondanao," *Infantry Journal* 2 (1905), by H.S. Howland,

Lake Liguasan is a vast swamp with alternating stretches of vegetation and open water. For the purposes of illustration it may be likened to a circle from which countless water ways (esteros) radiate like spokes from the hub of a wheel. It is subject to so many changes in appearance that a guide familiar with it from boyhood may have to search for hours to find his way. An open waterway of today may be a compact stretch of green vegetation tomorrow, vast patches of floating vegetation having closed it up in the interim.



Lake Liguasan, 1902



Today

Mexico

The Americas are known for two indigenous uses of floating real estate: the floating gardens of the Mexico City region and the floating villages of Lake Titicaca.



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We'll begin with Jose de Acosta's Historia Natural y Moral de las Indios (1590), the earliest description of the Aztec "chinampas."

Those who have not seen the seed gardens that are constructed on the lake of Mexico, in the midst of the waters, will take what is described here as a fabulous story, or at best will believe it to be an enchantment of the devil, to whom these people paid worship. But in reality the matter is entirely feasible. Gardens that move on the water have been built by piling earth on sedges and reeds in such a manner that the water does not destroy them, and on these gardens they plant and cultivate, and plants grow and ripen, and they tow these gardens from one place to another.

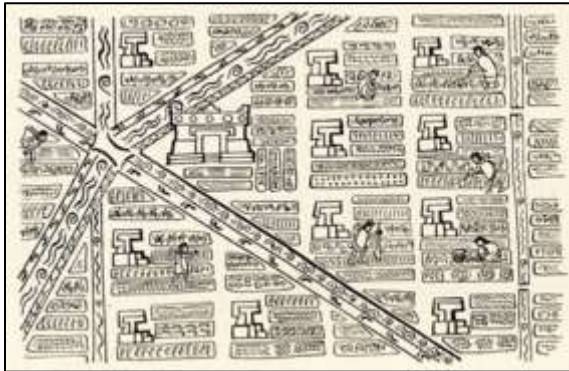


Acosta describes these fields only generally: soil piled on top of sedges and reeds in such a way that the field do not sink. He notes that they can be transported from one place to another, but gives no indication as to their size or method of cultivation. It is not clear where or even if he himself had witnessed the process.

Nine years later, B. de Vargas Machuca supplies some details in Milicia y Descripcion de las Yndias (1599).

They make garden plots... carrying in canoes sod cut in the mainland, to heap it up in shallow waters, thus forming ridges from 3 to 4 varas wide [2.5 to 3.4 meters] and raised half a vara above the water, a farm has many of these ridges, and the farmers circulate in their canoes between them, to tend the crops.

To the right, from mericae Nona & Postrema Pars (1602) by Theodor de Bry.



Relacion Breve y Verdadera de Algunas Cosas de los Muchas que Suciedieron al Padre Alonso Ponce en las Provincias de la Nueva Espana (1723 brings us additional description.)

These plots are... built upon the water by heaping sod from land and mud from the lagoon, forming very narrow strips... separated by canals and, as these gardens are raised less than a vara above the water, even without rainfall they bear vigorous maize, sustained by the moisture provided by the lagoon... They set maize seedbeds on the chinampas and they transplant the seedlings, which is a thing peculiar to that country.

According to another witness, seedlings were also started on floating foundations, a distinction that -- as we will later see -- that may relate to perpetuated misinterpretation.

Francisco Clavijero's Historia Antigua de México (1780) states that planting surfaces were formed from lake-bottom mud spread on top of a mesh of interwoven stems and roots from aquatic plants and that these chinampas were still extant at the time of writing.

Of their agriculture we have spoken in other places, where we have shown, that the Mexicans not only cultivated most diligently all the lands of their empire, but likewise by wonderful exertions of industry, created to themselves new territory for cultivation, by forming those floating fields and gardens on the water, which have been so highly celebrated by all the Spaniards and foreigners, and are still the admiration of all who soil upon those lakes.

As with Acosta, however, it is doubtful that Clavijero was reporting a personal observation.

Among those influenced by Acosta and Clavijero was Alexander von Humboldt who toured Mexico during 1803. In his Political Essay on the Kingdom of New Spain (1811), Von Humboldt introduces chinampas by noting the remarkable market in Mexico City and the variety of produce brought to market along the Canal de La Viga.

The greater part of these roots is cultivated on the chinampas, called by the Europeans floating gardens. There are two sorts of them, of which the one is moveable, and driven about by the winds, and the other fixed and attached to the shore. The first alone merit the denomination of floating gardens, but their number is daily diminishing.

The bulk of von Humboldt's comments focus on a natural model for such islands:

On the marshy banks of the lakes of Xochimilco and Chalco, the agitated water in the time of the great rises carries away pieces of earth covered with herbs, and bound together by roots. These, floating about for a long time as they are driven by the wind, sometimes unite into small islands... The oldest chinampas were merely bits of ground joined together artificially, and dug and sown upon by the Aztecs. These floating islands are to be met with in all the zones. I have seen them in the kingdom of Quito, on the river Guayaquil, of eight or nine meters in length, floating in the midst of the current, and bearing young shoots of bambusa, pistia stratiotes, pontederia, and a number of other vegetables, of which the roots are easily interlaced. I have found also in Italy, in the small lagoon di aqua solfa of Tivoli, near the hot baths of Agrippa, small islands formed of sulphur, carbonate of lime, and the leaves of the ulva thermalis, which change their place with the smallest breath of wind,

Simple lumps of earth, carried away from the banks, have given rise to the invention of chinampas. but the industry of the Aztec nation gradually carried this system of cultivation to perfection. The floating gardens, of which very many were found by the Spaniards, and of which many still exist in the lake of Chalco, were rafts formed of reeds (totora), rushes, roots, and branches of brushwood.

The chinampas sometimes contain even the cottage, of the Indian who acts as guard for a group of floating gardens. They are towed or pushed with long poles when wished to be removed from one side of the banks to the other.

"May still exist in the lake of Chalco" does not have the ring of a personal observation.

That the destinations of von Humboldt's itinerary make no mention of chinampas and that his description lacks the personal detail afforded to the majority of his tour, however, suggests that he did not consider the topic to be a noteworthy part of his study. Von Humboldt makes no claim that he actually saw floating islands in Mexico, as he does regarding those in the Guayaquil River or Lake Tivoli, or even that he had visited Lake Chalco.

Subsequent travelers and scholars nevertheless persisted citing von Humboldt's assertion as proof that the floating gardens had survived at least until 1803. Madame Calderon de la Barca's Life in Mexico During a Residence of Two Years in that Country (1843) celebrates the historic chinampas of Mexico City, which the author adds, unfortunately no longer float.

Surrounded by enemies and in the midst of a lake where there are few fish, necessity and industry compelled them to form floating fields and gardens on the bosom of the waters.

They weaved together the roots of aquatic plants, intertwined with twigs and high branches, until they had formed a foundation sufficiently strong to support a soil formed of the earth which they drew from the bottom of the lake; and on it they sowed their maize, their chili, and all other plants necessary for their support. These floating gardens were about a foot above the water, and in the form of a long square. Afterwards, in their natural taste for flowers, they not only cultivated the useful but the ornamental, and these small gardens multiplying were covered with flowers and aromatic herbs, which were used in the worship of the gods, or were sent to ornament the palace of the emperor. The chinampas along the canal of the Viga are no longer floating gardens, but fixed to the main land in the marshy grounds lying between the two great lakes of Chalco and Tezcuco. A small trench full of water separates each garden, and though now in this marshy land they give but a faint idea of what they may have been when they raised their flower-crowned heads above the clear waters of the lake, and when the Indians, in their barks, wishing to remove their habitations, could tow along their little islands of roses, it is still a pretty and a pleasant scene.

Jean Foulquier's fanciful 1878, "Jardin Flottants au Mexique." There were no reports of tree-bearing islands capable of hosting an entire farmstead.



Nineteenth-century discussion of chinampas tended to be but segues into recounts of the expansion of Aztec Mexico. "Floating Islands," Chambers' Journal of Popular Literature, Science and Art, August 29, 1874, illustrates the journalism.

Before the Spanish conquest of Central America, the Mexican lake was much larger than it is at present, having been subsequently drained to a great extent, and its level thus lowered. There was no land in the immediate neighborhood of the city; but native ingenuity supplied the want, and added a fresh charm to a place in itself sufficiently beautiful.

Whether there ever were natural islands floating on the lake, we do not know, but it is not unlikely that there were, and that from them the Aztecs took their first idea of floating gardens. These consisted of a great raft of wicker-work, often two or three hundred feet long, and strong and buoyant enough to support a deep bed of rich moist earth.

A tree was usually planted in the center of the raft, for the sake of its shade, and there was sometimes a hut for the gardener. Some of these gardens were devoted to the cultivation of vegetables for the markets of the city, such as cucumbers, melons, gourds, and other plants which flourish best in a damp soil; but far more beautiful were those which were sown only with bright tropical flowers, destined to deck the palaces of the Aztec emperor and his nobles, or adorn the huge temples of the sun.

The garden was either allowed to drift over the lake, or, as the water was nowhere of any great depth, was pushed along with a pole, or anchored in one spot by tying it to a long stake driven into the mud. Nothing in the whole of Mexico struck Cortes and his companions with such wonder as these floating gardens, and they called them chinampas, giving a Spanish form to the native name. According to Humboldt, the chinampas were very few in number when he visited the lake, for the extent of its waters had diminished; and the muddy shores laid bare as they fell, had been embanked and cultivated, and in many cases the name of chinampa, which properly belongs to the flower-covered raft, had been given to the mud-embanked gardens on the shore, perhaps because grounded chinampas sometimes really formed the basis of them.

As Frederick Ober reminds the reader in Travels in Mexico (1877),

The famous "floating gardens" are always just beyond the eye, floating a little farther on; if one is at the Viga bridge, they are down the canal at Santa Anita; at the latter place, they are at Xochimilco, and there one will hear of them as at Lake Chalco. But there are "floating gardens" near the canal, only they do not float, never did float, and never will float.

From Libro Tercero de la Historia Religiosa de la Provincia de Mexico de la Orden de Santo Domingo (1897) by Fr. H. Ojea,

These movable nurseries were 20 to 30 feet long [about 6 to 9 meters] and as broad as the farmer deems convenient, laid on rush, cattail, and sward, on these they set seedbeds for vegetables which are to be transplanted later, and they tow them with ropes from one place to another within the lagoon.

Foulquier's illustration appears in Frederick Ober's Young Folks History of Mexico (1895) with the following note.

There has been much dispute over this subject, as to whether the ancient Mexicans ever really had any such things as these floating gardens, as none of them can be found at the present day.

Ober's opinion is not based on affirmative evidence, but rather upon a presumed necessity for a mighty civilization.

There is no doubt that they did have them, for if we take into account the nature of their surroundings: with no firm land extensive enough for cultivation, and the nearest shore in possession of enemies, we must see that it was necessary for them to have something of the kind. It is said that they wove together willows and rushes, and upon this floating framework piled grass, leaves, and mud, thus forming a very fertile soil, always moist and extremely productive. These little gardens they could tow about from place to place after their canoes; but though writers of a century ago or more claim to have seen these chinampas, or floating gardens, none have existed within the memory of people now living. What are now called by that name are squares of firm land surrounded by ditches, which may at one time have formed these gardens, but which have been left by the falling of the lake, and no longer float. Upon these they raised their limited supply of vegetables: corn, peppers, chia, beans, and gourds, or pumpkins.

Joseph Antonio de Alzate y Ramirez, in "Memoria sobre Agricultura," Gacetas de Literatura de Mexico (1831), mentions a natural floating island between the lakes of Texcoco and Chalco, southeast of Mexico City. While the factual accuracy might be challenged, Alzate y Ramirez' reflection merits thought.

As to the existence of floating gardens, I shall report what takes place in the hacienda of San Isidro, located where the peninsula begins to divide Lakes Chalco and Texcoco. The hacienda owns a large floating island which serves to supply food to the farm animals. This floating island is known as Vandolero, because if the winds blow from the northeast or northwest more than two leagues from the farm, and if the south wind blows towards the east in a manner that is regular or to the southwest, it heads to join solid lands. There is no dispute that this is a true

floating island which can bear the weight of many oxen. I am inclined to believe that once in the valley of Mexico there existed similar orchards, although they are not there today due to decrease of the lagoon.

What surprises me is to see how certain people, simply because they do not see the floating gardens which our ancestors saw, infer from this that all the ancient historians told a fable, when floating gardens are not impossible. If a tiny layer of soil is placed on a cork or thin wood, and seeds are sown on it, these will be born and thrive according to the amount of land provided to supply juice to the plants. What I have well seen and divulged satisfies these specifications.

It is sufficiently clear that the shifting gardens were nor reported as fiction, but that the circumstances described lagoons of which the Indians inhabitants made use of to sustain themselves. We give credit to what we are told of Floating Gardens of Babylon because it comes from the East, and we doubt the Mexicans who are Westerners.

The floating farm's market would have been the capital cith of Tenochtitlan, an artificial island just above the peninsula in Lake Texoco.



Nuremberg Map, 1524

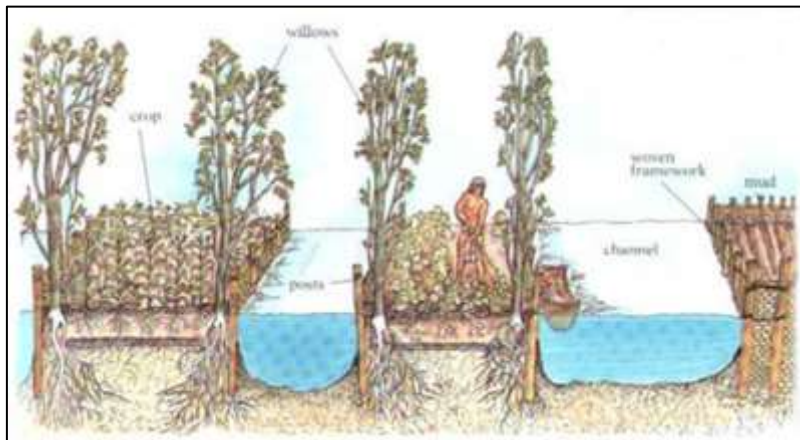
By the 1930s, historians -- Non-Mexican historians, that is, Alzate y Ramirez, would hasten to point out -- begin to fall into line that gardens never floated They were constructed in place between canals by layering mats of vegetation with mud in an engineered manner. A few decades back, we would have hailed it as "reclamation." Now it would be ruled to be "wetlands destruction."

Acosta most likely confused seedlings sprouting on chinampas-bound mats with the subsequent agricultural bounty produced on the newly-created strips of farmable land.

Chinampas are yet today constructed by dredging new canals to which rafts of aquatic vegetation are towed, layered to the desired height and covered with soil.



Farmers collecting mud from the bottom of a canal for fertilizer.



1930s Postcard

Peru

The Peruvian Uros tribe has for centuries dwelt on floating islands within Lake Titicaca's Puno Bay. Thirty-some of the islands today are home to about 2000 "kot-suña," people of the lake, roughly 30 percent of whom actually live on the islands; the others boat from Puno in the early mornings.

Larger floating islands, "q'illi," averaging 300 to 400 square meters in area and 1 to 2 meters thickness, are constructed of blocks of totora reed naturally intertwined over decades and topped with layers of fresh reeds applied several times per year, and finally, a cap of dry reeds.



The islands are anchored with ropes to sticks driven into the lake bottom. Construction takes three to six months and an island lasts about 40 years. Sawn edges make for straight banks.



The larger islands house about ten families, Some of the islands have electricity and telephone service. Cats keep the islands rat free.

The Uros fish with the assistance of domesticated cormorants, raise ibis for eggs and graze cattle on nearby shores, but mainly hawk handicrafts, garments, blankets, trinkets, and other souvenirs mostly produced elsewhere. Reed arches, viewing platforms and shrines attract tour boats for 20-minute stops, but it is the boat captains who decide, based on financial agreements.



"Floating Islands, Lake Titicaca." Northwest Review 47:2, May 2009, by Barbara Ras, add the following.

For twenty-five days, they carry out totora grass to throw down on the water, until the mass becomes a wide nest dense enough to hold houses, a museum, a church, all made out of the same stuff, monochromatic villages of straw, odd at first, but then look at the houses on the

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shores of the lake that rise out of the dark chocolate earth, unpainted exterior walls more bitter than sweet, so that you see an entire town made unmistakably of dirt. But on the floating islands, they've built a ten-foot flamingo out of reeds so tourists like us can rise above the often squishy mat that we know is rotting from the bottom but have no idea how often more grass has to be thrown down to make up for decay, and you wonder whether that means they have to move the museum of dead birds and the church, with its unexpected candles, and the flamingo, where up here we're waving now for the camera, oblivious to the equation of how much grass will support how much weight, or which straw will be the last.

The floating portion of Bolivia's most popular Titicaca island, Isla del Sol, on the other hand, is constructed of planks covered by a layer of reeds and held up by plastic buoys.



A portion of a poem by Barbara Ras, "Floating Islands, Lake Titicaca." Northwest Review 47.2 (2009),

*But on the floating islands, they've built a ten-foot flamingo
out of reeds so tourists like us can rise above the often squishy mat
that we know is rotting from the bottom but have no idea
how often more grass has to be thrown down to make up for decay,
and you wonder whether that means they have to move the museum
of dead birds and the church, with its unexpected candles,
and the flamingo, where up here we're waving now for the camera,
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how much weight, or which straw will be the last.*

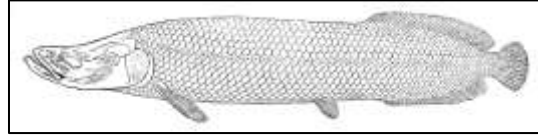
Brasil

As for Amazonian fishing, we cite "The Floating Forest: Traditional Knowledge and Use of Matupá Vegetation Islands by Riverine Peoples of the Central Amazon," PLOS ONE 10:4, April 2, 2015, by C.T. de Freitas, G.H. Shepard, Jr, and M.T.F. Piedade.

The matupá is part of preservation. You can see that if a lake doesn't have a matupá, the fish leave right away. When there's a matupá, the fish stay there. So matupás are really important. There is no other place with so many fish as where there are matupás.

In 60% of the interviews people pointed out the importance of matupás for fishing. As noted above, matupás are thought to support a greater abundance of aquatic life than in lakes without matupás. Matupás are also considered a strategic place for fishing, especially for the highly valued arapaima. Matupás are also considered a strategic place for fishing, especially for the highly valued arapaima (Arapaima gigas paiche).

The arapaima is among the largest freshwater fish in the world, reaching lengths of as much as 4.5 meters.



Fishermen claim that arapaima often hides under the matupá and comes up for air --the species breathes atmospheric oxygen -- in protected holes within the island. Some of those interviewed (14%) stated that the arapaima itself creates these holes by clearing away substrate during the early stages of matupá formation, and then maintains the opening as the matupá thickens and matures. Somewhat analogous to Inuit hunters who wait by holes in the ice to harpoon seals, local fisherman clear a trail to air holes in the matupá to harpoon the arapaima when it comes up to breathe.

Matupás are further discussed in Chapters 45 and 48.

Pennsylvania

"Six Weeks of Suspense: Port Deposit Settling Down to Its Regular Life," New York Times, March 19, 1893,

A fishing outfit: on the Lower Susquehanna is different from that of other sections. At its best, it is a floating island made of logs. The one which the writer knows is 184 long, 60 feet wide and over 11,000 square feet in area. Thick plank flooring securely nailed keeps the logs in firm position. On this float are six houses, including packing house, sleeping apartments, eating house, stables, and accommodations for forty men besides the cooks and extra assistants. There are two horses and a steam engine on the float for the motive power for seine hauling. During the winter, this float remains idly along the shore, but just as soon as the first signs of shad or herring appear, it is towed out of the water a mile or so, where experience has pointed out the best fishing, and there it is made stationary by enormous plies 50 or 60 feet long, which are driven firmly into the ground, and are arranged so as to allow the float to rise and fall with the tides.

Soil Enhancement

Here, we'll note a findings pertaining to the "compost" quality of harvested aquatic vegetation, beginning with Elisee Reclus, The Earth and its Inhabitants (1875-94),

The lowland bogs in the vicinity of the coast are far more difficult to reclaim. They have invaded most of the lakes of Friesland, imparting a violet or inky tinge to their water, which contrasts strangely with the verdure of the neighboring meadows. Sometimes the peat rises to the surface, forming floating islands of tangled vegetation, locally known as drijvillen, or rietsoden - - the "old wives' tow" of Ireland. The peasants occasionally float these drifting masses of peat into neighboring meres, the beds of which they desire to raise, and even engineers do not disdain to make use of them in their hydraulic constructions.

From "Ridding Reservoirs of Floating Islands. How the Charleston Water Department Met the Problem and Removed Masses of Floating Plant Growths from Water Supply," Fire and Water Engineering, September 6, 1922, by J.E. Gibson,

Contained No Plant Food Value

It was suggested by a number of citizens that this material probably contained a high percentage of plant food, and we accordingly had the Parker Laboratory of this city to make an analysis to determine what the available plant food amounted to. This analysis showed that the material contained no plant food whatever; the growing vegetation and semiaquatic plants analyzed about 97 percent water, the remaining three percent being mineral matter. The material after drying will burn slowly, giving off little heat or smoke.

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Perhaps better stated, the biomass harvest may be more of a soil conditioner than an a nutrient enhancement.

But in theri Brazilian study, de Freitas, Shepard, and Piedade (2015) report that,

In 89% of the interviews, inhabitants of RDSA pointed out the value of soil from matupás as a source of fertilizer. They stated that matupá soil provides excellent natural fertilizer for onion, chives, peppers and other spices.... One woman noted emphatically:

Ah! I always use matupá, the vegetables come up so pretty... My husband's sister-in-law made a little garden over there and used only matupá. Go have a look to see how pretty her peppers are! So beautiful. Beautiful, beautiful. Only with matupá!

Matupá soil is gathered in the dry season, usually taken from matupás that are still in the early process of formation. As lake levels drop during the dry season, these incipient matupás that already have a layer of organic matter but no large plants, often "land," which is to say, settle along the lake margin and begin to dry out. These "dead" matupás are the ones most often used by the people as fertilizer.

Cultivation on "dead" matupás located on the lake shore involves a serious risk of flooding, limiting more widespread use, because even though the seasonal flood cycle in the region is highly predictable, the lakes where matupás occur are vulnerable to sudden flash-floods.

Fully formed, floating matupás are not typically used for agriculture because local people say that these matupás would have to be cleared and burned to support crops.

Lost Farms

A news item from north-east Thailand, "Floating Farms Disappear," Daily Iowa State Press (Iowa City), June 13, 1899, deals not with farming an artificial island, but rather one formed by nature.

On the 10th of last month, at Xonghan, near the town of Kumpharaphi, on the Mekong, an island six sen wide and fourteen sen in length [240 by 560 meters].entirely disappeared.

There was a number of large trees, ten feet in circumference, on the island, and it was partly under cultivation. The owner searched for it during three or four days, but was unable to find it or hear any news of it. It seems that in the month of March there are always a number of islands floating down the Mekong. The owner of the large one that has just disappeared has seen many of them pass, and says they disappear in a few years. The owners are continually in search of their property, which rather upsets one's notions about the fixity of a landed estate.

"The Farm Floated Away" Chillicothe Morning Constitution July 28, 1906, about Sheboygan, Wisconsin,

The mysterious disappearance of a thirty-seven acre farm on the shore of Long Lake in Fond du Lac county was cleared today by the discovery that the tract had worked loose and drifted into the lake as floating bog.

An Overview

In visiting different continents and varied cultures, we've encountered much the same things.

Fishermen seek to establish themselves proximate to fisheries, Seasonal huts may be constructed on floating islands and families brought along, but rarely are such dwellings permanent, as the site may sink or float away by the season to come.

Farmers, on the other hand, don't care to invest their toil in a field that may head downstream with the next flood. Small islands constructed of sufficient biomass to firmly weight themselves on the lakebed below provide nutrient-rich plots suitable for boat access. An Aztec agriculturist transported to southern Asia or to the Tigris-Euphrates delta would recognize the island-building technology.

Chapter 36 -- Visit Fisherfolk and Farmers

A final reflection from José Alvarez, a.k.a., Fray Mocho's Un Viaje al Pais de los Matreros (1897), which we'll leave in Spanish

Camalotes – En Las Tierras Bajas

En las islas, se puede vivir sin rancho, sin ropas, sin armas y sin familia, pero no sin la canoa, que es la casa y el caballo.



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CHAPTER 37 STROLL

As noted in the Introduction, to qualify as a "floating island," a buoyant object should be capable of supporting a person's weight. "Supporting," however, can be interpreted in a number of ways. As would a sidewalk? Just enough to keep one's head above water? Stable enough to walk upon? The latter, the sensation of walking upon a floating island, has long been a subject of discussion. This chapter will draw together a number of such accounts.

A "quaking bog" or "schwingmoor" is largely comprised of a Sphagnum mat floating over water or saturated peat and anchored by sedges. Walking on it causes it to tremble, and thus its name. Larger perturbations may cause visible surface ripples and even cause trees to sway. Native Americans called them "trembling earth" and Cajuns call them "tremlantes."

The sensation of walking on a floating wetland is sometimes compared to crossing a trampoline. Below we've assembled a spectrum of comparisons ranging from mats capable of barely buoying a person's weight to floating islands said to support rhinoceroses.

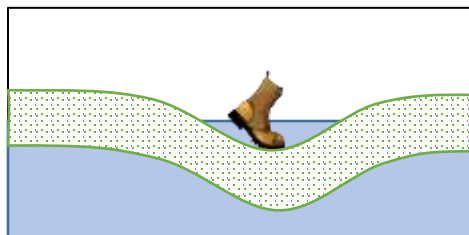
We'll underline the salient descriptions.

Alaska

Alaska's Tanana Flats contains some 100 square kilometers of a dense, fibrous mat of rhizomes and peat, 0.5 to 1.0 meters thick, floating over clear water or ooze 1.5 to 2.5 meters above the substratum. The herbaceous over-story ranges from 50 to 100 centimeters. An observation from Groundwater-Discharge, Wetlands in the Tanana Flats, Interior Alaska (1991) by Charles Racine and James Walters,

The structure of these mats appears to vary from place to place, as indicated by the variation in the depth to which we were able to deflect the mat by standing on one foot and measuring the water level on our boots. The lowest deflection values were 10 cm and the highest were 50 cm. Mats dominated by buckbean generally had the highest deflection and the highest open water cover, whereas pure sedge mats had the highest vegetation cover and the lowest deflection.

To the right, a boot depressing a 50-centimeter mat 50 centimeters.



California

"Agricultural Notes." Expositor, April 27, 1877, the region of Lassen Volcanic National Park,

M.B. Lewis, County Surveyor, has been surveying swamp lands in the vicinity of Summit Lake, during the past few weeks. He describes the land in that section as being exceedingly rich, but owing to the drought and the tule fires, are nearly devoid of vegetation. Some portions of the land he was surveying was covered with what he terms dry bog, a fine substance composed of

tule ashes and decomposed vegetation, into which a person sinks up to his knees at every step.

Surveying such land is very difficult, but the task is further augmented by the fact that the land is nothing more than a floating island. The ground, or what is termed ground -- being a mixture of earth, roots and decayed vegetation -- is from two to four feet thick. Beneath this is a body of water, evidently a part of Summit Lake. At every step the ground quivers for a number of feet around, and thus it is very difficult to get the correct bearings of the magnetic needle. Good drinking water is procured by cutting a hole through the soil to the water, which can be done in a few seconds.

As "Summit Lake" could be a descriptor, rather than today's naming, the report might pertain to Willow Lake Botanical Special Interest Area, with its floating mats of sphagnum, Green Island Lake and its 5-acre floating bog rimmed with huckleberries, buckbean and potentilla, or Frog Lake where one can still step on its tiny floating island. Floating mats of *Menyanthes trifoliata*, *Potentilla palustris*, *Carex limosa*, *Sphagnum squarrosum* are also reported to occur at Grass Lake in the Sierra Nevada, California.



"Fishing a Floating 'Island'," Outdoor Life, July 1967, Jim Martin, Willow Lake

I didn't break through. I simply sank. It was like trying to walk on a giant marshmallow.

By waving my arms and twisting my body, I managed to keep my balance on the undulating grass, but I won no blue ribbons for grace.

Bog walking calls for some fancy footwork, but it's fairly easy once you learn to keep moving. If you remain in one spot too long, the grass will lower gradually until the water underneath begins to ooze through it and over your feet.

Occasionally you'll find a weak spot or a hole. Avoid these. I don't think that a person would plunge through, and become trapped beneath the turf, but the experience could prove a little nerve-racking.

Sacramento–San Joaquin River Delta, California

In its natural state, the Sacramento–San Joaquin River Delta was a freshwater marsh of shallow channels and sloughs surrounding low islands of peat and tule. By the late 1800s, however, 500,000 acres of the delta had been diked for agricultural utilization, exposing the peat to oxidation which dropped the land surface to below sea level.

"Night Scene on the San Joaquin River," 1862, a peat fire in the background.



From "California's Floating Gardens." San Francisco Call, April 14, 1912,

Within two hours ride by rail from San Francisco lie a round score of islands, the highly cultivated surfaces of which regularly rise and fall with the tides that surge in and out through the Golden Gate scarce miles away. At the confluence of the Sacramento and San Joaquin Rivers, with steamers, schooners, launches and barges in constant attendance, they supply nearly half the population of California with vegetables and berries.



The main line of at least one great transcontinental railroad is laid: across a portion of this district, on what is practically a pontoon bridge from 40 feet deep and 10 miles long -- to miles of pulsating, resilient peat.

Whole tracts of land, each embracing hundreds of acres, are really lying like lily pads on the .water, while human, ants surge back and forth upon them in an eternal struggle for existence.

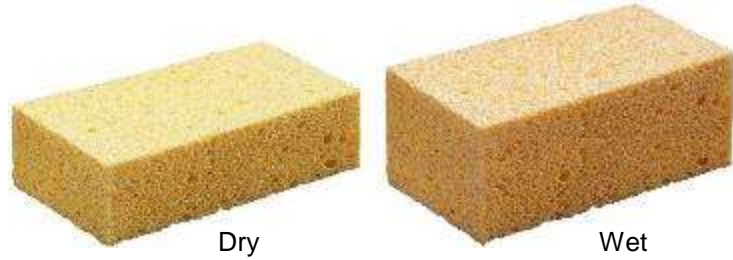
By far the greater proportion of the surface of nearly all the islands in the delta of the San Joaquin River is composed of peat, ranging all the way from 4 feet to 90 feet in depth. Some of the islands of the lower Sacramento are also largely of peat formation. Owing to heavy sluicing and hydraulic mining much of the peat in the latter-named river has been covered with sediment washed down from the mountains.

The river man has seen large chunks of the formation, broken loose from the main body of the island, drifting with the current in the river, or lying beached upon some sandy strip of the mainland, where it had been left by an outgoing tide. Nor is it the detached only that are subject to the ever varying rise and fall of the waters. He has noted that, seemingly, the entire peat body of an island breathes water as the tides rise and fall.

He will illustrate what he means by placing a wet sponge a pan and pouring water around it. As the water in the pan rises, the surface of the sponge will also rise slightly, even though the bottom of sponge will still be resting on the bottom of the vessel.

Chapter 37 -- Stroll

The explanation, we emphasize, is not for a truly-floating land mass, but rather for an island resting on the bed. To the right, expansion as a function of moisture.

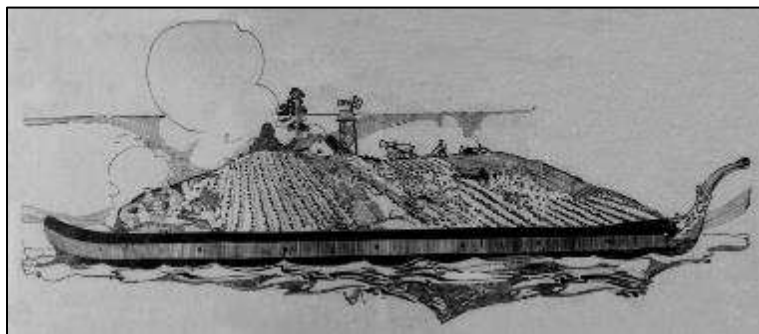


At high tide he has stood on a section of land apparently as high and dry as any and has teetered up and down on it until the whole surface shook jelly-like for rods in every direction. In the season of high water he has gone over a flooded district in his launch and there found rounded knolls rising gently out of the water, comprising in extent several hundred acres of land -- and these at places where he knew the soil to have been a perfectly flat prior to the flood. Clad in his long rubber boots, he has sprung from the boat and ran in upon the land, which sank with each step as if he were treading upon a huge pile of hay. On the highest point he has stopped. He has stood, both feet together for minutes, ever so gently, and silently except for a slight bubbling sound beneath his feet -- this land which has produced vegetables in profusion is sinking. The weight of his body is causing a displacement of the water beneath the mass of peat. Gradually it oozes through the grass at his feet, splashes over his instep at the wriggling of his toes, rises to his ankles, and then mounting above them, slowly climbs his legs until it comes to a stop at last near his knees, is standing in the exact center of a miniature lake feet or :more in diameter.

The island farmers, who have their buildings near the levees with foundations laid on the peat, find that after a few years the buildings get out of plumb, with a decided list toward the levee, and they are under the necessity of trueing them occasionally as a result. The explanation for this is that dredgers are constantly at work piling new material on the levees, strengthening them and making them higher. The weight of the levee presses down the edge of the peat land near to the end that all buildings located near become tilted.

Like a sponge, when peat is drying, it will shrink, while shrinking it will crack, and having cracked the breach will not close readily. For this reason, dredgers annually visit the tallest and strongest of the peat levees during the dry season and liberally coat them with wet mud from the bottom of the river. It is surprising how this holds the moisture in the levees and keeps them intact until the wet season begins.

It might be thought that the peat lands present insurmountable difficulties in engineering, but it has been demonstrate that practically .the opposite is true .so far as railroad building is concerned. On the stretch of fifteen or twenty miles of peat pontoon west of Stockton, over which: the Santa Fe trains pass daily, the trains actually make up time. It is claimed that peat forms an ideal roadbed, being just resilient enough to take up all jar from the trains.



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To the west of Lake Tahoe, California, lies the much-smaller Mirror Lake. From the Sacramento Daily Union, June 15, 1890,

This lake covers an area of about five acres. Floating on its surface is a lawn-covered natural island, some twenty feet in diameter, which floats with such a natural buoyancy as to carry a fishing party of from four to six people, who paddle it about the lake.

The photo "At Lake Tahoe," said in the May 4, 1895, Pacific Rural Press to be Emerald Bay, is in fact Mirror Lake. Note the conifer and the several passengers.

The photographer has chosen a point where an object of much interest is in sight, a floating island sustaining tree growth and capable of sustaining quite a cargo of: tourists, as the picture shows.



"Lake Tahoe and its Tributary Attractions," Sierra Highlands (1890s) remarks that the conifer has since been cut down.

Floating Island Lake, so named for an unanchored island of matted roots, grasses and shrubs, that floats upon its surface, and at one time also upheld a thrifty conifer

"A Veritable Floating Island," Amateur Naturalist, January 1904, proposes that dust has augmented the formation.

Floating about on the surface is a mass composed of plants, roots and earth. This mass is about twenty-five feet across at the top, and is nearly circular in shape. How far it extends downward is unknown. The roots of the plants are so interlocked and filled in with earth that the whole mass is firmly attached. Where the earth came from is largely conjectural, but it is supposed to be the accumulations of dust blown from the surrounding mountains. So far as is known, this floating island has existed for an indefinite period. A great many persons have been on the islet.

More recently, Wilderness A Complete Guide of Over 200 Miles of Trail and 140 Trout Streams and Lakes (1975) by Robert Wood,

The island, at least in 1969, consisted of a badly trampled rectangle of turf about 8' wide, 20' long and 2' thick, which drifts with the wind until it runs aground. It appears to have been hewn out of the small meadow at the lake's north end, probably by unnatural forces.

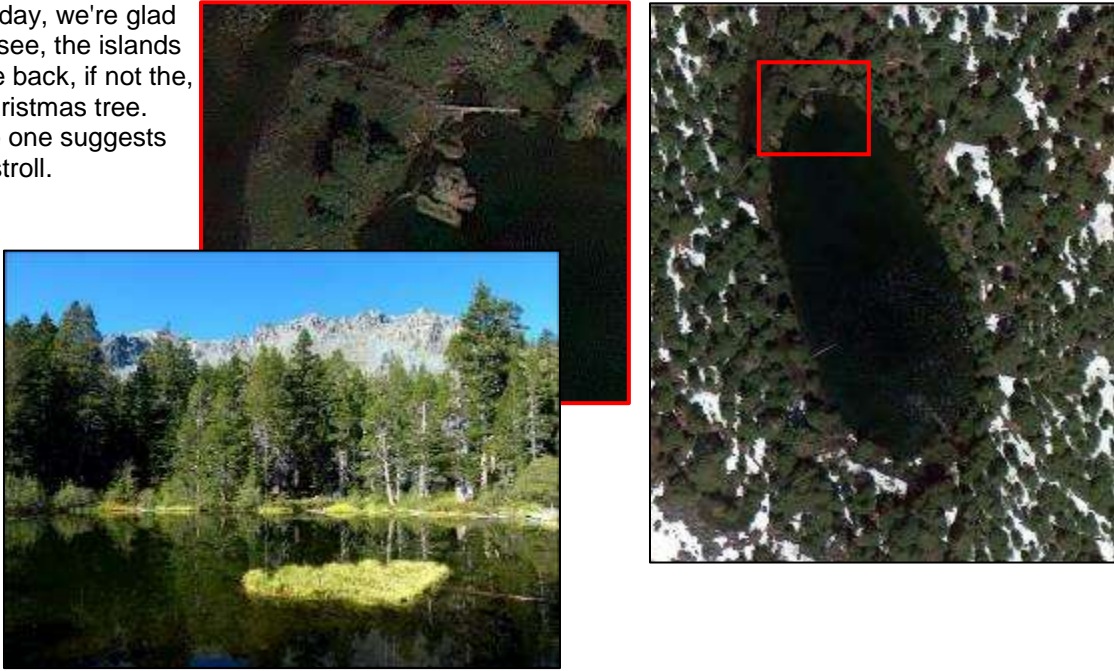
Jeffery Schaffer, in The Tahoe Sierra: A Natural History Guide to 106 Hikes in the Northern Sierra (1987), reports four floating islands.

In 1890 this unique lake was noted as having a 20-foot-diameter floating mat of grass and shrubs, whence the name. In 1979 there were four floating, grassy mats, and more mats were ready to slough off from the lake's soggy northeast shore. It's a mystery why the mats slough off at this lake and not at any other, for in all other respects Floating Island Lake seems quite ordinary.

Three decades later, however, Afoot & Afield Reno-Tahoe: A Comprehensive Hiking Guide (2006), by Mike White, finds nothing.

Five-acre Floating island was named in the late 1800s for a 20-foot diameter, grass- and shrub-covered natural island that at one time supported a thriving conifer. Since that time, several more grassy mats have sloughed off from the lakeshore and floated about the lake, though when I recently visited the lake, the surface was devoid of floating islands.

Today, we're glad to see, the islands are back, if not the, Christmas tree. No one suggests a stroll.



Connecticut

"A Floating Island," State League, October 5, 1865,

Wyassup Lake of North Stonington, was originally a natural pond of twenty-five or thirty acres, which was frequently visited by the residents of the vicinity. A short time since, however, the Wyassup Reservoir Company raised this lake seventeen feet, causing its waters to cover an area of about one hundred and seventeen acres. As the waters rose, the island rose with them, and thus it remains. The soil is spongy, and as the visitor treads upon its spongy surface, he feels a little insecure, but soon finds himself as safe as on the solid land. It is a curious incident, and rather too much for the philosophers of Eastern Connecticut. They cannot account for it.

"Fishing Through a Floating Island," Fitchburg Sentinel, August 8, 1883, Thompson, Connecticut,

The pond looked black and dismal in the pouring rain, but the floating island a few rods from shore lent interest to the view. Our fisherman rowed us over in an old scow, and stepped out with the tea chests that both his followers had been told to bring along. The fishing ground bent under our feet at every step, so that the black water gurgled up around our ankles, but so thick and strong were the roots of the bushes and grasses intergrown that a perfectly safe support was afforded.

"A Floating Island," New York Times, September 17, 1865,

Wyassup Lake. of North Stonington, was originally a natural pond of twenty-five or thirty acres, and contained an island of two or three acres, which was frequently visited by the residents of the vicinity. A short time ago, however, the Wyassup Reservoir Company raised this lake seventeen feet, causing its waters to cover an area of about one hundred and seventeen acres.

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As the waters rose, the island rose with them, and thus it remains. The soil is spongy, and as the visitor treads upon its springing surface he feels a little insecure, but soon finds himself as safe as on the solid land. It is a curious incident, and rather too much for the philosophers of Eastern Connecticut. They cannot account for it.

Florida

"The Islands the Alligators Build," Our Animal Friends, May, 1894, Frank Chapman, Bevan's Arm, a branch of Alachua Lake,

The island was two to three feet in thickness, and floated in water from fifteen to twenty feet in depth. As I stepped from my canoe on to its edge it sank slowly beneath my weight, and, stepping backwards, I could thus draw the floating canoe after me; but as I advanced toward the center of the island the shore rose, and the canoe was lifted from the water by this kind of natural drydock.

Progress now was very much like walking on cracked or partially melted ice. Where the grass grew thickly there was a firm footing, but the spaces between the little hillocks were treacherously soft. To fall through an island would no doubt be a novel experience, but one that the experimenter would doubtless never attempt again.

"One-Man Nature Center," Nature Magazine, February, 1948, by Edwin Way Teale, Orange Lake,

We landed near one of these giant pigweeds and found the base of the stem more than a foot in diameter. As McKay walked about on this floating island, the ground rose and fell under him. Like portions of the great Okefenoke Swamp, it was a Land of the Trembling Earth. Once McKay's foot went through a weak spot almost up to his knee. In midsummer, the acid muck stings like biting ants when it touches bare skin and haste is made to wash it off.

A friend of McKay's once dropped clear through an island, disappearing in the mud and water. He popped up again like a cork and scrambled into the boat in fear that an alligator might be lurking beneath the land-raft.

"Lake of the Floating Islands," North with the Spring (1951), Edwin Way Teale, Orange Lake

Years ago, when he first came to Orange Lake, he pulled up beside a similar island in a small boat and, assuming without thinking about it that it-like other islands-had a shelving beach, jumped off into the water over his head. The scow-like prow of our boat pushed through the outer fringes of water hyacinths, water lettuce, arum, cattails, smartweed, and sawgrass up onto solid ground. We climbed out to walk about on a floating island. The sensation was a little like advancing across a circus acrobat's net. The ground gave slightly beneath us at every step. It seemed to rise and fall as we advanced. Here was a Land of the Trembling Earth in miniature. Each footfall set the plants quivering. The strength of the mat of interlacing roots seemed to determine the firmness of our footing. Once McKay's left foot found a soft spot and his leg shot downward into soft mud up to his knee.

"Florida's Fantastic Floating Islands," Coronet, February 1961, Norman and Madelyn Carlisle, Orange Lake,

"It's like walking around on a big sponge," says McKay.

Some visitors may get mildly seasick at seeing what looks like solid earth undulating around them. There are air pockets into which the unwary can fall, emerging plastered to the armpits with black mud.

"Daffiest Lake in America," Saturday Evening Post, July 12, 1952, Lake Hellen Blazes, headwaters of the St. Johns,

"Some of this stuff is firm enough to take a few steps on, especially around trees," he commented. "But there's only one island in the whole lake which doesn't float, where you can get out and stretch your legs.

"Floating Islands and Bird Island Scenic Cruise," Ocala Star Banner, October 7, 2009, Orange Lake,

The naturally formed, "Floating Islands", were from 8 to 10 feet thick, and solid enough to walk on. They were covered with a growth of dense flowers and some of them had tall trees growing on them. They moved over the lake at a whim of a breeze. Visitors were permitted to walk on one of the world famous "Floating Islands" if they cared to do so.

Occasionally, storm winds rip up vegetation. For example, in 1993 on Florida's Lake Istokpoga and in 1994 on Lake Okeechobee (photo to the right), flooding and wave action left several feet of floating dead vegetation compact enough to walk upon.



In the case of Lake Okeechobee, a subsequent drought lowered the water level, and the floating island (approximately fifteen miles long and several hundred feet wide) settled to the bottom, forming a berm between the main body of the lake and the adjacent marsh.

Idaho

The Hayden Survey of 1872 described Henrys Lake (no apostrophe) as a Henrys Lake, as "a shallow body of water, about 3 by 2 miles in diameter, and full of small, scattered islands." The islands were large accumulations of logs and debris covered with grass, and some even sprouting small trees.



1872



1890

A description of a 300-foot floating island in Henrys Lake from "Floating Islands," The Friend; A Religious and Literary Journal, April 23, 1887,

The outer edge was a tough sward, and so thin that it gave down under the weight of a man and let him into the water boot-top deep.

"Henry Lake, Idaho," Illustrated West Shore, April 18, 1891

On Henry lake, sometimes on the north side and sometimes to the southward, or wherever the breezes chance to bear it, is a curious floating island, which appears in the engraving on this page. It is about three hundred feet in diameter and has for its basis a mat of roots, so dense as to support large trees and a heavy thicket of undergrowth. Decayed vegetation adds to the thickness of the mat and forms a mold several feet in thickness.



1891



Today

On the edge of the floating forest, in summer time, may be seen a luxuriant growth of bluejoint grass, the roots of which form so compact a mass as to support the weight of a horse. Any number of men have no difficulty in walking about on it. Farther back among the trees one might build a large house and make a garden and do whatever he pleases. He would be just as solid and safe as though there were not one hundred or two hundred feet of water underneath.

There is a willow thicket near the center of the island, and scattered among these willows and contiguous to them are a number of aspens and dwarf pines. These catch the breezes which pass over the lake and act like sails on a boat and move the nearly two acres of land hither and thither over the forty square miles of water. This shows why one may one day see the island on one side and the next day on the other side of the lake. Henry lake is exceedingly picturesque.

"Idaho's Island Wonder," Port Chester Journal, February 18, 1897

The edges of this floating island are thin, of course, but near the center it is several feet thick and of sufficient strength to support a good sized summer hotel, if someone could be found that would care to make such a venture.

Old mountaineers who are well used to all kinds of queer things declared that the floating island of Henry Lake is the most wonderful thing to be seen in the mountain regions of the United States.

The tale that a man lived in a cabin he built in the late 19th century on one of these floating island is partially true. One island did have a crude cabin. When the lower Snake River valley was inundated by a dam in 1924, the islands were dynamited.

"Lake Residents Check Out Express Isles -- Several Thompson Lake Islands Cut Loose in Storm, Sail into Residents' Yards," Spokesman Review, December 18, 1995,

For one thing, they're spongy. Really spongy.

"It's like stepping onto a big mattress," said lakeside homeowner Mark Johnson. "You can feel them move under your weight."

"They're very treacherous," he said. "I wouldn't trust them. You might walk along and fall through. Then you can't get back up -- you're trapped."

Louisiana

"Strange Floating Islands," Minneapolis Journal, June 18, 1903,

Some Acres of Wandering that Tremble when Walked Upon and Are Often Tenanted by Farmers.

Most of the swamp is what the Creole swampers call prairies tremblantes (trembling prairies). It is land, but floating land, built up over the water by the accumulation of centuries of logs, branches, leaves and vegetable mold. It is light enough to float, but strong enough to support men and even cattle. It trembles when walked on.

Maine

"Great Natural Curiosity -- A Floating Island," Bangor Daily Whig and Courier, May 6, 1866,

We learn that there has existed in Eddington Pond for many years an island of about half an acre in extent, which literally floated upon the water, having no hold upon the ground save what was afforded by the roots of some of the trees upon it which had grown through the island into the bottom of the pond. The surface of the island is sufficiently strong to sustain the weight of a loaded team.

Paddling the Northern Forest Canoe Trail (2009), by Darren Bush, regarding Floating Island Bog (Chapter 64),

An island made of sphagnum and other mosses which is large enough to support live trees. You can walk on it, but it's like walking on thin ice; you might drop into it if you hit a thin spot.

Massachusetts

The Book of Berkshire (1887), regarding the town of Otis,

In the southerly part of Rand Pond is a floating island of considerable extent. It is composed of debris and the tangled and matted roots of shrubbery, and when one walks over it a quaking motion is imparted to it, extending some distance on either side.

"Hornpout Anglers Miss Floating Isle," Port Arthur News, March 24, 1955, the disappearance of the 30 by 50 foot floating island which had existed since 1876 in Mossy Pond near Clinton,

The island varied in thickness from two to five feet. In the dry season. It would sit about two feet above water level. But when the rains came, it would grow heavy and drop about a foot. Its surface was covered with small trees and bushes on a base of earth and moss, and the walking was treacherous. The swampy bottom on a number of occasions had collapsed beneath careless sportsmen.

"Notice of Floating Islands," American Journal of Science and Arts, January 1, 1827, by Amos Pettingall describe the floating island of Newburyport (Chapter 48).

In passing across its surface, the whole island is considerably agitated, and presents a waving appearance, like the sea; you are toiling continually to ascend, as though it were a surface of flexible ice.

Traversing the floating island in Island Pond, Springfield, Massachusetts (Chapter 77), is said to be like "walking on a waterbed."

Minnesota

The Duluth lakeshore at has long been noted for its boggy terrain. Jay Cooke's Gamble, The Northern Pacific Railroad, the Sioux, and the Panic of 1873 (2014) by John Lubetkin quotes the daughter of a surveyor.

[The wetlands were] sometimes mere potholes into which a man would step and find himself wallowing waist deep, sometimes stretches three or five miles wide, but all filled with black

muck which was not water, for no one could swim in it, nor land. For no one could walk upon its surface... [One] could see great heaving ripples, sinister and unbelievable, go across its surface. [It was] a dark expanse... with stunted evergreens. bright insects hovering in the damp air, and the twisted knees of roots running back and forth everywhere.

A reminiscence in Dwight Woodbridge and John Pardee's History of Duluth and St. Louis County, Past and Present (1910),

Sometimes, landing for the purpose of cutting a fishing pole or for general investigation or exploration, we were surprised to find that the footing was unreliable, and occasionally the ground would suddenly give way and the unfortunate disappear into the water and muck beneath as far as his arms, only to be immediately yanked out by an accommodating friend or struggle up, if alone, upon a more solid footing.

"A Week in Duluth," Atlantic, May 1870, offers an outsider's impression, that of John Townsend Trowbridge.

A visit to the "floating-islands." These are among the most interesting curiosities of the place. They lie in full view of the town, mostly off Rice's Point, which separates Superior Bay from the bay of St. Louis, -- a pretty sisterhood of green-wooded islets, each gracefully topped by the shaggy spires of its little group of tamaracks. They are actually floating, though anchored apparently by the roots of trees reaching down through them to the bottom of the shallow basin in which they rest. They undulate and rock in storms, and are sometimes moved from their moorings, by high winds and seas, when they float about till lodged in some new position. Not long ago one of these green-masted ships parted its cables in a westerly gale, crossed the bay under a full sail of tamarack boughs, and grounded on Minnesota Point, where it still remains. We touched at it in one of our excursions, and found it to all appearances a mere raft of living roots imbedded in an accumulation of vegetable mould. It is overgrown with moss and bushes, and trees twenty or thirty feet high.

It is very spongy, it heaves and shakes as you treat or jump upon it, and I have thrust a fish-pole through it into a greater or less depth of shallow water beneath. There are no large trees upon it, but it is covered with various water-loving shrubs and plants, whose roots form a compactly quilted mass, thinnest at the outer edge, where it appears still to be in process of formation.

New Hampshire

"Floating Island," Lowell Daily Citizen and News, May 19, 1858,

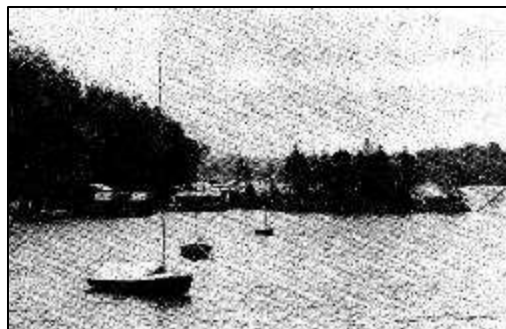
There is in the westerly part of Dorchester, N.H., a pond 400 rods in length by 200 in width ; and floating upon its surface is an island eight rods in length and three wide, consisting of a spongy mass of roots, earth, &c., sufficiently compact to sustain the weight of a number of persons. It is covered with a dense growth of low bushes, and when there is no wind, it remains stationary with every appearance of an ordinary island, but before a moderate breeze, it continues moving until it impinges upon the opposite shore, where it remains until the wind changes. As a freak of nature, it is well worth a visit from the curious,

New Jersey

"Part of an Island Breaks Away and Floats on Lake," New York Times, August 31, 1962,

Three residents of Awosting, a summer community on the southeast shore of Greenwood Lake, were wondering today what to do with a piece of land they acquired at the height of a wind storm.

Small spit of land, center-right, resting against docks



The land, approximately 100 feet long and 50 feet wide, broke loose from an island yesterday, floated across the lake and came to rest against docks owned by Gotthold Rose, Evan Moore and John Fatigatti. Now they can't get their speedboats in or out.

The errant real estate, replete with trees and underbrush, began its journey shortly after 5 P. M. yesterday. It couldn't have attracted more attention had it been an ocean liner. Lakeshore residents watched its progress in awe, and many took to their boats to accompany the floating land on its trip.

Typical was the reaction of Mrs. Dorothy Kniedl of the Moose Head Lodge. She was serving a customer, Ray Richard of Hewitt, when she saw the land start its voyage.

"I didn't know what to think," Mrs. Kniedl said, "I was really afraid to say anything to say for fear that he might think that I was crazy.

Finally Mrs. Kniedl got up the courage to tell Mr. Richard, and they both dashed outside to watch the real estate sail by.

As the land made its way out into the lake, three youths in a boat pulled up to it and ventured "ashore." Rick Waitsma of Awosting, one of the youths, said that the floating land felt spongy and took on the motion of a boat. He said the trees on it acted like sails.

The island from which the land broke loose has no official name, although locally it is known as Fox Island, or Sadie's Island. The latter name, according to legend, derives from a woman who was reported to have lived in a shack there. Apparently both Sadie and the shack disappeared a number of years ago.

The May 7, 1904, editorial in Rockland County Times makes no reference to strolling on Greenwood's floating island, but we'll include a portion of it for its pithy dismissal of its rival newspaper.

The Warwick Dispatch says that a floating island is anchored in Greenwood Lake. Someone should anchor the Dispatch's editor on party politics.

New York

"Cranberrying," Greece Press, December 12, 1946,

The difficulty in getting to the cranberry patch at all is that the marsh itself is but a huge matting, of weed growth. Jump on it and it rises and falls like a floating island. Make a misstep and one falls thru into the black sucking muck.... We carry oars in one hand, against this emergency (one can climb out on an oar bridged across a hole) and with the other hand we bend the reeds at an angle in order to mark our path back.

"Floating Island," American Weekly, March 23, 1947,

As the waters rose with each rain fall, the surface of Lake Tiorati continued to expand until it covered about 320 acres of land. In the same period, the floating bog continued to grow larger until it became an Island comprising an acre of dense, new vegetation. Its floor thickened to about four feet, making it possible for a person to walk on it.


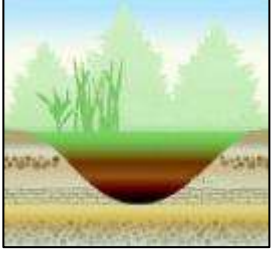
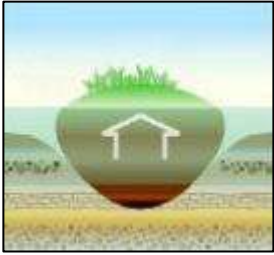
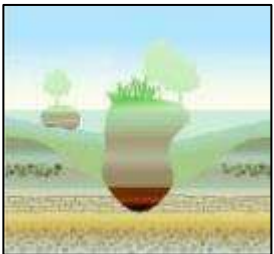
"Who Owns Mystery Island in Lake?" Fulton Patriot, May 9 1963,

Dingle explained that much of the shore area Lake Neatahwanta is "bog", that is, land on the surface of the lake, washed away underneath and held together by roots of trees. He pointed out that, in these areas, "With each step you take, you feel the earth move beneath you."

Ohio

In 1751, Christopher Gist, who'd accompanied George Washington on his first visit to the confluence of the Allegheny and Monongahela, camped just south of what he christened as the "Great Swamp," two long and narrow ponds joined during high water.

The genesis of Cranberry Island

	<p>11,000 Years Ago, A kettle lake forms</p> <p>Huge blocks of ice fall away from thawing glaciers and create depressions in the soft, wet earth. The blocks melt and the depressions fill with water, forming kettle lakes.</p>
	<p>4,000 Years Ago, The kettle lakes become a peat bog.</p> <p>Sphagnum moss gradually overtakes the lake, forming a bog. The moss releases acid into the water, which retards the growth of other punts. Dead moss cannot decompose completely in the acidic oxygen-depleted water and accumulates in layers of peat below the mat of living moss.</p>
	<p>1830, The peat bog becomes an island</p> <p>When the Great Swamp was flooded to create Buckeye Lake as a reservoir for the Ohio & Erie Canal, a 50-acre mass of moss rose from the floor and expanded as might a waterlogged sponge, coming to be the lake's floating island, 6 feet above the surface.</p> <p>The Ohio & Erie Canal aspect failed, however, because the reservoir was too shallow to supply the canal for dry-season traffic.</p>
	<p>Today, A shrinking island</p> <p>Waves, damage from ice and wakes from power boats are steadily eroding Cranberry Island.</p>

1910



Today



From "The Vegetation of Cranberry Island (Ohio) and Its Relationship to the Substratum, Temperature and Evaporation," *Botanical Gazette* 52, July 1911, by Alfred Dachnowski,

Near the northern bank of the lake, about one-half mile southeast of Buckeye Lake station, is the bog island, approximately one-tenth the dimensions of the lake. In position it is more or less sheltered by hills and a woodlot. The peat mass rises and falls with the changing water level of the lake, and supports a vigorous growth of trees, low bushes, sphagnum mosses, and cranberries.



Borings were made at various points on the island with a sampling tool devised by Davis to determine the depth and the character of the peat. About 50 soundings were made, which indicate an average depth of peat of 30-35 feet along the southern shore of the bog island, and 11 feet of peat along its northern shore. Borings made to the depth of 40 feet at the southernmost points of the island, and in the lake south of it, failed to reach bottom.

"Buckeye Lake Has Floating Isle of Reeds," *Newark Advocate*, August 15, 1934, mentions a traveling island

The island is about 50 by 80 feet and came through the channel at Edgewater Beach Sunday morning, and has been floating and turning since that time. Last Sunday night the floating mass moved north about 350 yards and by Sunday afternoon it floated back to its original location and then proceeded slowly south for a considerable distance. George Combs, who has charge

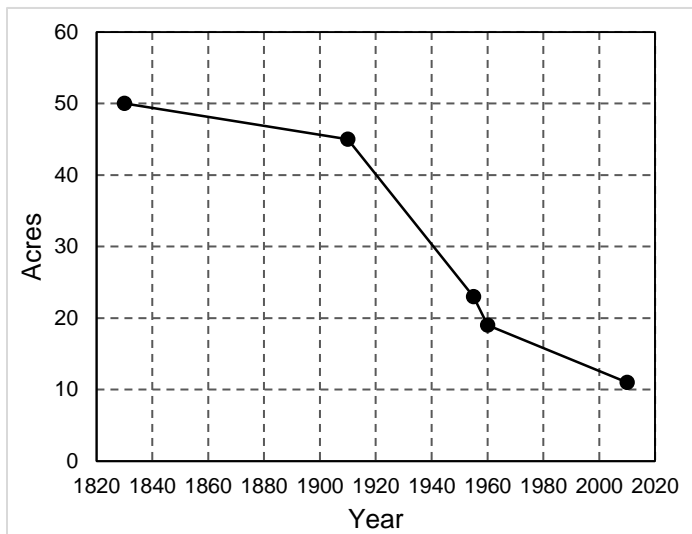
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of the beach, and Foulk watched the moving mass. This island is thick with cattails and flags. Foulk said the island broke loose from the channel dredged by state boats about five years ago.



Cranberry Island, 1939

Civilization and nature have conspired to destroy the island. Ice pressure from the sides and below arches the island. The island is eroded by wake from recreational watercraft. While the acidic waters of most bogs help perpetuate sphagnum, the well-oxygenated and slightly-alkaline conditions of Buckeye accelerate natural decomposition. The ring of maple, oak and shrubs on the island margins shades out replenishing bog plants. When trees topple, clumps of peat clinging to the shallow roots are torn free. In recent years, two chunks of the island have simply broken off and floated away.



Cranberry Island will in all probability eventually disappear.

Cranberry Bog State Nature Preserve is stable enough to support a walker, though visitors must remain on the boardwalk. Other than an annual one-day open house, however, visitation is by permit only.



Standing on sphagnum



Digging into the mat

Pennsylvania

"They Float Around in a Careless Sort of Fashion, With an Occasional Queer Freak, One Being to Spin Around Like a Monster Top," North Adams Transcript, May 9, 1899, White Oak Pond near Aldenville,

You might suppose that to walk upon or to fish from one of these islands would be a source of some danger, but, aside from an occasional wetting of the feet no accidents from this cause have ever occurred, so far as I have been able to learn. The sensation produced by walking on a floating island is very similar to that which you and I have both experienced when, as boys, we ran on thin, young ice, or thicker old and rotten ice. You remember how the ice used to bend under your weight as you ran across it, sometimes sinking nearly a foot and then with the next step rising to meet you, possibly throwing you and perhaps giving you a ducking?

Well, it's the same way with the floating islands, but with the element of danger eliminated. It has the same fascination.

Rhode Island

A bog flourished at the site of Bowdish Reservoir before the stream was dammed in 1850. Today, a few sphagnum islands float in 7 feet of water.

Aerial photos in which the floating island can be seen to be diminishing.



1992



2005



August 2006



July 2008



May 2015

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Floating island, transect 10

Advice from the Rhode Island Blueways Alliance,

The shoreline is often rocky and floating bog mats in the center of the pond make for an interesting ecosystem to explore from a small boat. Just do not try to walk on the floating bog mats because you will fall through.



"Where it's at: Mercer County's Key Natural Areas," Sharon Herald, November 2, 2003

Mercer Bog in East Lackawannock Township contains a 140-square-meter floating mat peat vegetated primarily by few seeded sedge, cranberry, pitcher-plant, three-way sedge and cotton-grass. Robert Coxe of the Western Pennsylvania Conservancy, which conducted the inventory, said you can jump up and down on the mat and it will make waves.

Vermont

Is the floating island of Sadawga (Chapter 67) firm enough walk upon? It depends upon whom we ask.

<p>No "Floating Islands" <u>Bulletin of the Geographical Society of Philadelphia</u>, January 1914, by Sidney Powers</p>	<p><i>A man may stand on a board, and not get his feet wet, but if he stands on the sphagnum, the water will gradually rise to his ankles. It is not possible to stand on the cat-tail part of the mat, for this part is not firm.</i></p>
<p>Yes <u>The Youth's Instructor</u>, June 5, 1917</p>	<p><i>The structure of the island is so compact that any part of it may be traversed with perfect safety.</i></p>
<p>With Care. "Floating Island Set Loose by Storm Draws Sightseers to Lake Sadawga," <u>North Adams Transcript</u>, November 28, 1950</p>	<p><i>Persons walking on the island must use caution, since danger spots exist where a false step would send a person plunging through the cushion-like surface into the deep waters beneath the surface.</i></p>
<p>Not Very Easily January 27, 2009 trip report posted on the internet</p>	<p><i>It's like a floating sponge. If you try and get out of your boat and walk on it, it would be like walking on a big wet sponge -- not very easy!</i></p>

Wisconsin

"Floating Islands of Lake Chetek Are Moving Again," Milwaukee Journal, September 29, 1934.

Usually but two feet in thickness, the spongy surface of the little islands may be walked on in serenity.

Peru

The surface of the floating islands of Lake Titicaca (Chapter 36) has been described as if walking on a waterbed, each step sinking 2 to 4 inches, depending on the density of the reeds underfoot.

From "The Island People," Slate, February 25, 2011, by Joshua Foer,

Stepping onto a floating island is an unnerving sensation, like walking on a giant sponge that squishes underfoot. Though the reed mats are up to 12 feet thick, there is always the feeling that one could step right through to the cold lake below.

From a tourist's web posting.

That island seemed a little thin in places, and the reeds would sink down about 6 inches when you walked. You could hear water squish under your feet.

"Secrets of the Amazon: Giant Anacondas and Floating Forests, an Interview with Paul Rosolie," Environmental News, March 10, 2010, regarding the Peruvian Amazon near the Tambopata River,

Walking on the floating forest at night is a surreal and very spooky experience. The floating part isn't very stable, one wrong step and you get plunged into the lake. It was an intimidating place but with careful navigation we found a completely alien environment. As we walked, we passed only the tops of the aguaje palms whose base lay rooted to the lake's floor forty or fifty feet below.

For years I had been hearing about a lake that was somehow special. Everyone in the community had a profound respect for it because it was rumored to have tremendous anacondas and full grown giant black caiman. I suspected all the hype to be mostly exaggeration. But when we launched our first exploration of the place, we instead found the legends to be understated. The lake is huge, and is surrounded by a palm forest swamp system that stretches for miles. But the most incredible part is that floating on top of the water's surface is a raft of vegetation and grass which supports a smaller dwarf forest. This "raft" is tremendous, we still don't know its exact size, but it is arranged in a patchwork that covers over 80% of the lake's surface. Acting as support pillars for the vegetation raft and dwarf forest, are the tops of aguaje palm trees which are rooted to the lake's bottom.

Walking on the floating forest at night is a surreal and very spooky experience. The floating part isn't very stable, one wrong step and you get plunged into the lake. It was an intimidating place but with careful navigation we found a completely alien environment. As we walked, we passed only the tops of the aguaje palms whose base lay rooted to the lake's floor forty or fifty feet below.

United Kingdom

Author Chet Van Duzer's foot on the floating island of Derwentwater (Chapter 48)



Greece and Turkey

Pausanias, Description of Greece (2nd century),

The fable was probably told of the islands in the bay of Tsafitaii, to the north of Orchomenus, whose banks overhung and quaked under the tread, as do the banks of the river Melas in some places.

Tanzania

"Examination of the Southern Half of Lake Tanganyika," Journal of the Royal Geographical Society 45 (1875), Verney Cameron and C.R. Markham,

"Tingy-tingy" is the name for the grassy obstructions at the mouths of rivers, too thick for boats to pass but not strong enough for men to walk upon, and "sindy" is the name when it will bear men. Thus the Kirumbwe River (Kalambo of Livingstone), at the south-east corner of the lake, is said to be all tingy-tingy, with a little study. The floating islands of Lake Tanganyika are formed of the long cane-grass called matele. It grows very thick and gets other vegetation matted in at the water-line, forming a sort of floating peaty soil in which the young matele takes root. The old grass in time dies and is set free and when a favorable wind or current occurs, the island thus formed starts on its cruise.

Turkey

Turkey's collection of walkable floating islands is so large that we'll give it a chapter unto itself -- Chapter 38.

Azerbaijan

H.C. Ralenson, "Notes on a Journey from Tabriz," Journal of the Royal Geographical Society, November 1841

A short distance lower down the stream there is a natural object which is considered one of the great wonders of the district: the river, it seems, swells out into a small lake, and in this there is a floating island of spongy turf, which is usually moored at one side, but can be pushed with long poles to all parts of the lake.

"Azerbaijan," Scottish Geographical Magazine 6.2 (1890),

This floating island is called Chamli-gul, or the meadow of water, and consists of a thick mass of roots and reddish clay about 40 feet by 60, the thickness of the island at its edge is one yard and a half, and it moves from one side of the lake to the other according as the wind blows, approaching the edge of the lake so near that we could easily jump upon it. It is all covered with

grass and reeds, and in the summer is a favorite pasturage for flocks.... During our stay at Paderlu the island changed its position four times

"In the Mountains of Media," Living Age, April 4, 1891,

The next point we were to visit was a curious natural phenomenon, a floating island in the center of a small highland lake. This islet is known amongst the tribes as Chamli-gul, or the meadow in the water, and consists of a thick mass of roots and reddish clay about forty feet by sixty feet, with a thickness at the edge of a yard and a half. It occupies more than half of the little lake, and changes its position with the wind; when there is a strong breeze it comes near enough to the shore to allow of ones jumping on to it, and the shepherds are very fond of driving their flocks on here in the summer time, for the grass is very sweet and there is no fear of straying. I got on without difficulty and found the island anything but pleasant to walk upon, being very oozy and soft owing to the recent rains; as for the lake, it is reported, like many others, to be unfathomable. I had nothing with me, however, to put this statement to the test.

According to the Cultural Heritage Administration of West Azerbaijan,

"Lack of a proper access road, sanitary facilities, and advertising have all caused this attraction site to remain unknown," said Matlubi, while noting that in spite of these limitations, about 5,000 Iranian visitors as well as 200 foreign tourists visit the moving grass each year.



The Upper Nile

"The Barrage of the Nile," National Geographic, February 1910,

The density of the vegetation even in deep water is remarkable: Again referring to the photographs, these show how the men can walk over it without sinking into the mass, such is its tenacity and strength. Animals such as the rhinoceros have been seen crossing the Nile upon this great water carpet which is woven as deftly and strongly as by the loom.

In terms of body weight per footprint area, a rhinoceros exerts some 4 times more pressure than does a human.



"Functioning and Dynamics of Wetland Vegetation of Lake Victoria: an Overview," Wetlands Ecology and Management 15:6 (2007), F. Kansime, M. Saunders and S. Loiselle,

The papyrus mat forms a floating structure strong enough to support the weight of a man, and consists of interstitial spaces through which water passes (providing the plants with a nutrient source)... One can walk on this mat without realizing that there is a water column beneath, as deep as 2.5 m.

Uganda and the Egyptian Soudan, Charles Wilson and Robert Felkin, (1882).

The grass which floats on the top of the water is so thick that it is quite possible to walk upon it; and were it not for the covering which nature has thus provided, the evaporation over such a vast area, would greatly diminish the supply of water received by Lower Egypt: thus the evil and the good are closely blended.

The Vegetation of Namanve Swamp, Uganda (1935), William Eggeling, northern shore of Lake Victoria,

Their roots so bound together as to form a thin, compact, floating mat of vegetation.... [When walked upon,] this mat sways and sags in a horrible manner beneath one's feet, several square feet at a time disappearing below water should one cease moving even for a moment.

"Living on Kyoga's floating islands," NewVison, April 29, 2007,

David Nsamba, the district fisheries officer of Nakasongola,... said these people are risking their lives because the surface of the islands is uneven, thin and some people liken walking on it to walking on a waterbed.

"The unwary might not notice a thin spot and sink a leg into the frigid waters of the lake. The children born on the islands find difficulty walking on the mainland due to the hard nature of the grounds," he said.

"Life on the Suds: The Floating Isles of Lake Kyoga," East African, January 17, 2000,

Philip Onyango, 80, walks to his hut carefully over a pile of loose papyrus. The ground is soggy and he falters with each step. Sometimes, his feet sink ankle deep into murky water. When he steps into his hut, the whole structure trembles.

The "ground" beneath him is only a meter deep and easily disturbed. Below that are 10 meters of water. All around are thickets of water plants and mud.

The whole "island" shakes when the wind is high.

Workers from the Hydrobiological Research Unit of the University of Khartoum walking on a raft of papyrus in the sudd



It is not uncommon to see a photo of elephants, such as that below, labeled as "on the sudd." Given the weight of elephants, however, the location is on nearby wetlands.



Teddy Roosevelt in South Sudan



Australia

"Floating Grass Mats of the Northern Territory Floodplains -- An Endangered Habitat?" Wetlands 2:1 (1982), Richard Hill and Grahame Webb,

The bird fell some distance away across the plain, and with the intention of securing the plumes for a lady friend in Melbourne, he and a companion walked out to retrieve it. While doing so, they walked onto a patch of grass which started rocking under their feet. Returning later they found they had been walking on a mat of grass floating over a waterhole which, they noted with dismay, was infested with large crocodiles. This appears to be the first record of floating mats in the Northern Territory.

Fiction

"Duck Hunter's Adventure," Boys and Girls Section, Los Angeles Herald, August 2, 1908, by James Elverson, is set in "Hemlock Inlet" and "Big Moose Brook."

Where I stood on the island of matted grass the water oozed up to my ankles, and I was horrified to find that, the grass was slowly sinking under my weight. The truth flashed across my mind. . The island of grass is merely a spongy bog, floating on a deep slough of liquid mud.

When I slipped into the mud and water, it had an unpleasant bottomless feeling. I experienced a dread akin to that described by persons caught in quicksand. My fright at the thought of again attempting to scramble through the uncanny depths between me and the shore was almost hysterical.



You know I am not a good swimmer and even if I had been, it would have availed nothing in the quaking mass of mud.

In the meantime the portion of the grass on which I stood was sinking into the black ooze.

I lay down in the water, which was fortunately quite warm, and placed my gun under me on the grass at right angles to my body. In this way, my weight was borne by a larger surface of the grass, and the floating island rose so that I was no longer lying in the water.

Chapter 37 -- Stroll

An engaging sketch of a Laputian walker from a 1900 edition of Gulliver's Travels (Chapter 81)



Conclusion

As evidenced by the varied descriptions, floating islands span the full range of walkability. If so venturing, being prepared for sinking footings would be in order.



Bog Shoes

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CHAPTER 38

EXCLAIM "NE GÜZEL BİR YÜZEN ADA!"

If we're standing on a floating island, we're likely to be in Turkey, where there are many to stand upon. "Ne güzel bir yüzen ada!" means "What a fine floating island!"

Turkey has a long history of such real estate. As noted in Chapter 32, Pliny's floating islands of Lydia were in what's now that nation, though in which particular lake remains debated.

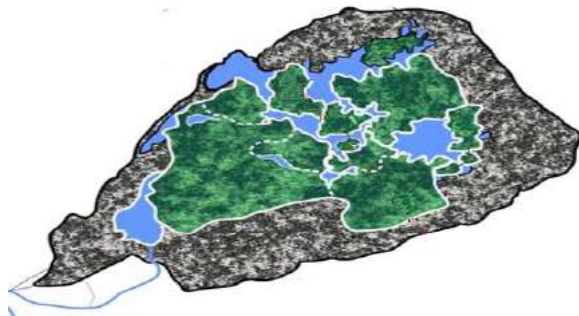
Heinrich Ulrichs' Reisen and Forschungen; Griechenland Bremen (1840) observed that the River Melas, today's Manavgat on the eastern slopes of the Taurus Mountains, is surrounded by black vegetable fens. Peasants call it "the swimming land."

But the best reports are the modern. From publications in English alone, we can identify significant floating islands in the provinces indicated to the right..



Let us undertake a brief, visual tour.

Northeastern Turkey



Mezra, Artvin

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Chapter 39 -- Exclaim "'Ne Güzel Bir Yüzen Ada!"



Cimli, Artvin



Arsiyan Plain, Artvin

Sedeva, Artvin



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Boga, Artvin

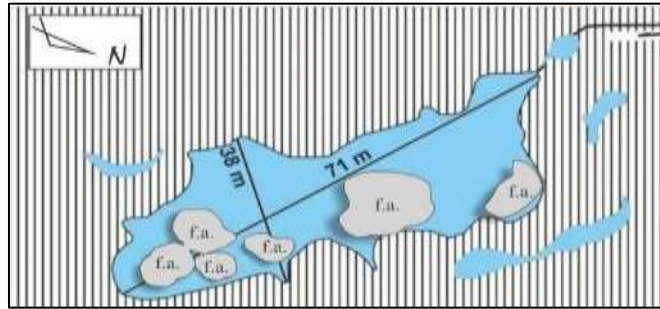


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Koçdüzü, Rize



Zökün, Erzurum



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Northern Turkey



Golya, Giresun

Ladik, Samsun



Eastern Turkey

The three free-floating islands of the 300-square-meter Turnalar Pond, Bingol, appear to be the world's most sailed-upon landforms.



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To protect the feature from rambunctious sailors, the site is now enclosed by a fence.

A news item regarding another site: "Turkey's Largest Floating Island Found in Erzincan" Anatolia News Agency, October 24, 2007,

A floating island has been discovered recently near Ahmetli village in the eastern city of Erzincan. The island is considered to be the largest one among eight other floating islands in Turkey.

Mustafa Özdemir of Atatürk Üniversitesi in Erzurum said the number of the floating islands across Turkey rose to nine with the recently discovered floating island near the Southeastern village of Ahmetli located in Erzincan.



We found that the island, which stretches over an area of 105 square meters, was formed due to the accumulation of the herbal-concentrated organic waste over time. It is 48 meters long and its width ranges from one and a half to five meters. It is the largest of all in Turkey.

From "Ahmediye Floating Island/Ahmediye Yüzenadasi," Journal of Turkish Studies, January 2006,

An example to the recently discovered floating islands is Ahmediye Floating Island. Having been in the territory of Erzincan City. Ahmediye Floating Island have many different features. At the same time, it is biggest floating island known not only in our country but also in the world.

While the world-record claim could be disputed, the astonishing aspect of the report is that such features are yet being "discovered," or perhaps better put, being brought to outside attention.

Central Turkey



Ciplak and Göndüren, Sivas



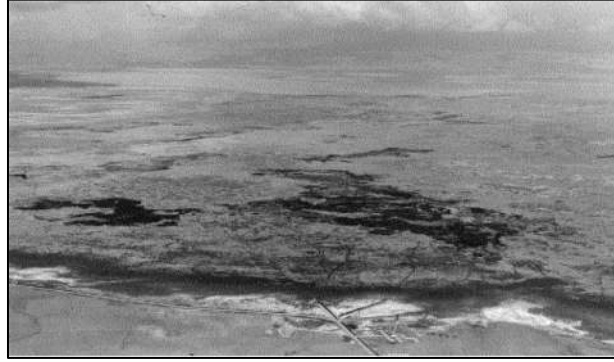
Göbel, Çorum



Koyungözü, Tunceli

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Sultansazligi, Kayseri



Eastern Turkey



Sakligöl, Denizli

Eber, Afyon



Southern Turkey



Demirozu, Mersin and Yaylayani, Mardin

Abdulharap, (Çat Dam), Adiyaman



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Future Research

Our tour could have been a bit more fact-based, had we more facts to include. The dimensions of the lakes can be determined from maps and the general geology gleaned from regional surveys, but we know little more about the islands themselves than what's shown in the photographs.

Having geographically identified the subjects, comprehensive geologic, hydrologic, environmental and human-factor data is required to generalize the underlying science.



Thanks are due to Prof. Ihsan Bulut of Ataturk University who has long pursued the enumeration of Turkey's floating islands and whose students, upon the challenge of further research will eventually fall, we see above.

CHAPTER 39

SAY "UJUV SAAR," "ELDOŠĀ SALA," OR "PLAUKIOJANTIEJI SALA"

Should we receive a nod from a local, we're in Estonia, Latvia or Lithuanian, respectively. There's most always a floating island close at hand in the Baltic states.

The underlying geology of the three nations is sandstone, shale and limestone, Eskers, moraines, and drumlins disrupt the hilly uplands alternating with low-lying plains, resulting in frequent flooding. The Baltic region is dotted with more than 7,000 lakes and countless peat bogs, swamps, and marshes.

Nation	Percent Wetland
Estonia	22 to 33
Latvia	10
Lithuania	25 to 46



Estonia

Eesti NSV Järved ja Nkaitse [Lakes of the Estonian S.S.R. and their Protection] (1977), by A. Mäemets, documents floating islands on 16 lakes, about 4 percent of the lakes cataloged.

Estonia merits leading our list by having in 1999 issued the world's only floating island postage stamp. (Chapter 74 notes a floating island stamp issued by Tanzania, but as admitted on the stamp itself, it's only an island that appears to float.)

The Estonian stamp shows Tolkuse Bog, at 55 square kilometers, the largest component of the Rannametsa-Soometsa landscape reserve.



Lake Porkuni

From the Estonian Daily, regarding the floating islands in the 47-hectare lake

"Floating Island Floats into Power Lines in Laane-Virumaa," July 12, 2001. When a 0.5 hectare island floated across Lake Porkuni, its trees became entangled in power lines crossing the lake, and the town of Porkuni was without power for 90 minutes.

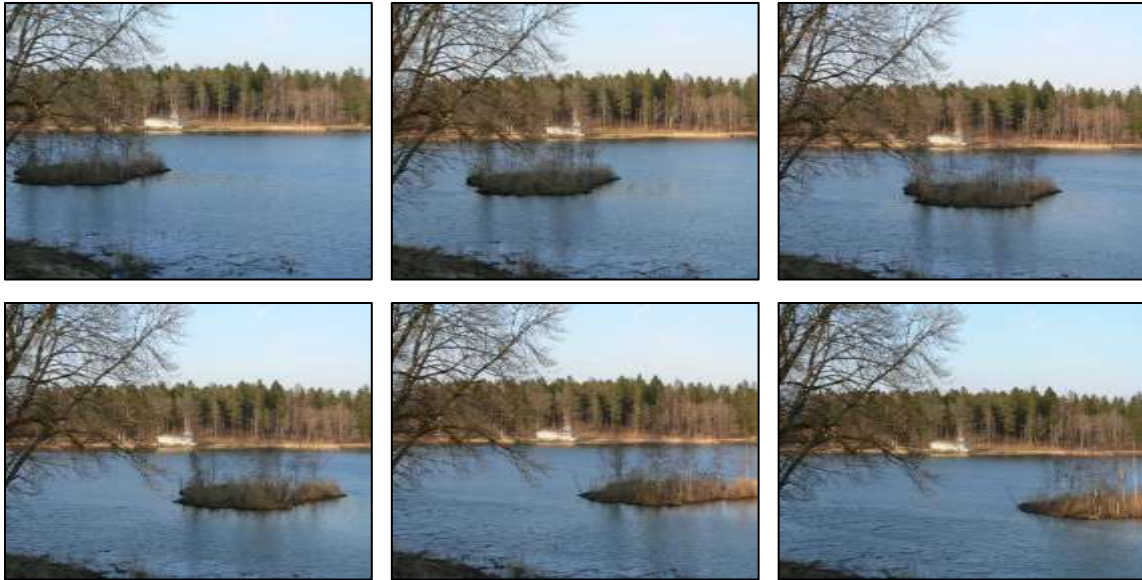
"Floating Islands of Porkuni Lake will be Pulled Out on the Lake Bank," October 3, 2001. The floating island that caused problems for boats and the local electricity supply will be removed from the lake

"The Last Days of Porkuni's Floating Islands," February 1, 2002. Local authorities plan to remove 17 floating islands, as they have damaged boats and caused electrical shorts when

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trees on the islands touch power lines. The islands are formed of peat and have reeds growing on them.

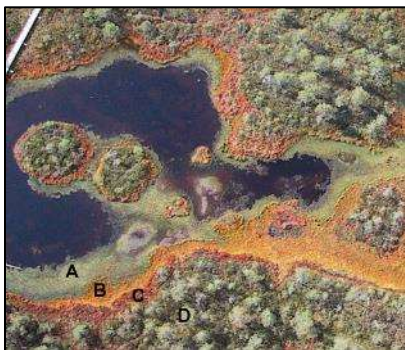
Below, a Porkuni traveling island



Mannikjarve Bog



Flux chambers to sample gas emissions



- A = *Sphagnum cuspidatum*. floating
- B = *Sphagnum cuspidatum*, pool shore
- C = *Sphagnum rubellum* above water
- D = Pine trees and dwarf shrubs on hummocks

Viru Bog, 235 hectares, is located in a former lake formed after the continental ice melted. Overgrowth took place about 5000 years ago, its expansion limited by surrounding dunes. Since the average annual growth of peat is 1 millimeter and the thickness of the peat layer is about 3 meters, the bog's age may be approximately 3000 years.

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Endla Lake



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Nigula Bog, upon which *Sphagnum cuspidatum* forms a silvery green floating mat. Reddish-brown zones include *S. magellanicum* and *S. rubellum*. Heather covers much of the mottled green surface along with a few small pines



Eight hectares of floating peat islands rose in Narva Reservoir between 1970 and 1978. "Floating Russian Island Visits Estonia," RIA Novosti, June 22, 2009, describes the international incident.



A four-hectare island drifting on the Narva Reservoir has crossed the border between Russia and Estonia and floated to the Estonian shore, the Pohjarannik newspaper said on Monday.

An Estonian border chief said that there are several islands drifting on the Russian side of the Narva Reservoir, which marks the border between Russia and Estonia.

"This year, due to a high water levels the islands began to drift," the newspaper quoted Valeri Kiviselg as saying.

About three weeks ago Estonian radars picked up an unknown object floating down the Narva River towards a dam at a Russian hydroelectric plant near the border town of Ivangorod. Power plant workers managed to open the sluice gates in time, and the island, covering an area of about 6,000 square meters, floated further along to the Gulf of Finland.

Winds and currents, however, carried a four-hectare part of the island, covered with dense forest, to the Estonian shore last Friday. However, strong winds over the weekend have caused the island to drift again.

Both the Russian and Estonian side are unable to predict the island's movements, but say it could damage buildings on the Narva River.

Two more reports, beginning with "Russian Island 'Emigrates' to the Baltic," June 24, 2009,

The territory of Estonia has increased by four hectares, after its banks was come floating island, previously was on the Russian side of the Narva Reservoir. Three weeks ago, the Estonian Border Guard has detected an object floating towards Estonia. It turned out to wooded land, which in past Friday "sailed" on its territory. Estonian border guards explained that in the Russian part of the Narva Reservoir there are a few natural floating islands, which are beginning to move at the rise in water level, but over the past 10 years this is the first case of "border crossing," as reported edition of Postimees, the future direction of the movement of floating islands is difficult foresee, and it is likely that it could cause damage buildings on the banks of the Narva River.

"Russian Floating Island Destroyed on Estonian Border," RIA Novosti, July 17, 2009,

A four-hectare floating island in a reservoir shared by Russia and Estonia was destroyed on Friday, after it approached high-voltage cables leading to a hydropower plant, a local power utility said.

Floating islands, consisting mainly of peat and aquatic plants, are a common phenomenon in the Narva Reservoir, as large areas of peat bog were flooded during its creation in the 1950s.

The island, which had trees up to 12 meters high, had alarmed authorities when it drifted across the border dividing the reservoir in June, and got stuck near power lines, threatening the work of the Narva Hydroelectric Station.

"The floating island, which had been monitored by both citizens and authorities on the Russian and Estonian shores of the Narva River for several weeks, has ceased to exist," the TGK-1 utility's press service said in a statement.

When the island approached the reservoir dam at 13.30, the sluice gates were opened and the island "was destroyed within 15 minutes," the statement said.

On the lighter side -- it's best to be light, in this case -- "Bog Walking Jiggly, Giggly Family Fun," New York Times, September 26, 2010, is about Lahemaa National Park,

We took our first steps off the walkway and onto the bog that surrounded us. The ground wobbled like soft pudding. Our arms flapped as we tried to maintain our balance. Giggles filled the forest air.

Let other hikes stake their claims on rapturous beauty or rare animals. For wacky family fun, it is hard to top a trek in the peat bogs of Estonia, where nature has bequeathed a waterlogged landscape that makes every stride a mini-adventure.



"This is like walking on a giant sponge!" my 13-year-old daughter, Danya, said.

Parts of the park are threaded with walkways that allow visitors to wander through without stepping on the bogs, but that would be missing the point. Our guide, Triin Ivandi, outfitted us with rubber boots and bog shoes, which resemble large paddle ball rackets, and we were off.

The trick to trekking through a bog, we learned, is not to make any impulsive movements. My wife, Julie Dressner, noted that if she shifted her weight from side to side, she could avoid slowly sinking.

The wetter the peat, the more likely your bog shoe would break through the surface. And that might result in a faceful of peat.

For those who enjoy a ramble, Chapter 37 contains walking stories from many other places.

Latvia

Lake Ilziņa ("Ilsing" in older German references) has an area of about 20 hectares, a mean depth of 5 meters, a maximum depth of 12 meters and a peat bottom.

Regarding the lake's floating island, we'll look to the newspapers. From "Ile Flottante en Livonie," Annales des Voyages, de la Géographie, de l'Histoire et de l'Archéologie (1850), published in a St. Petersburg newspaper,

Lake Ilsing, near the stately Festen grounds, offers a most remarkable natural curiosity. Every summer we see an island appear on its surface, and then on the day of Saint-Michel [the beginning of Autumn], it submerges to the bottom of the water.



This island, first observed by Fischer in 1780, has not yet been satisfactorily explored. However, here is some information taken from a work for which we are indebted to a pastor established in the neighborhood:

"Lake Ilsing has exceptional features that distinguish it from other floating islands. It always appears where the lake is the deepest, and it always seems to announce the end of the autumn, the eyewitnesses testify. The island ordinarily rises to the surface in the second half of August. It did not make appearance in 1849, which is attributed to a cold and rainy year. It is 120 sagues [1 sagene = 2.1 meters] in length and 18 sagues in width. The land is remarkably compact. It is 100 paces from the nearest shore. The strongest winds are not able to move it.

"Lake Ilsing is surrounded by fairly high mountains, and its size, which has increased since the establishment of a mill dam, is two versts wide [1 verst = 1.06 kilometers]. Its maximum depth is 4 sagues. The edges are formed of clay at certain places, and also of clay or loam."

From an unidentified Latvian paper of 1850,

Natural wonder Vidzeme. Both sites are found in some lakes with marshy bottom with small islands, sometime in the trees and bushes overgrown with thick roots and spread its light and so does the wind at times and at times on the lake on the other side of the top drive away.

In some of the places, small islands are found in lakes with marshy bottom, sometimes overgrown with trees and bushes and thick roots. The wind at times drives them to the other side of the lake where they stop.

The readers will be happy to hear that the wonderful islands read about in our beloved Latvian newspapers are now known to the Riga German newspapers. Vestienas, of the Manor Vidzeme, not far from the Daugava Ilziņa, has a narrow owned lake, 2 versts long with shores of marshy black earth and 3 or 4 axes are deep.

At the same between 16 and 18 axes lies large island at the bottom is solid swamp land, where no post can penetrate, with the steep sandy shore descending to the lake. On the same island grows tall sedge. This island stands some 80 or 100 steps from the lakeshore, always in the same place and never, neither can wind nor waves drive it to the other side.

But at first frost, it sinks to the bottom and remains in the same place as if tied as if in winter sleep.

Senior people have heard from their fathers that the island always been the same. Fishermen who fish there with their nets after her sinking never encounter it. We hereafter have to say to the King David: Oh, sir, how much are your works! Your thoughts are very deep!

As summarized in Naturforscher-Vereins. August 28, 1872.

Cand. Westermann reported on his visit to the periodically appearing and disappearing island of Ilsing sees at the festival. At the beginning of spring, no trace can be found of this island, only with time does it lifts the soil, especially at one point, until it is 8 inches above water surface usually in late July. The lake is used as a mill pond, so the water level changes often, yet the island is not inundated by rising water, but remains at the same height above the water surface until sink gradually in autumn. The warmer the summer, the sooner the island appears. In cold summers, it sometimes rises above the surface of the water not at all. In June this year Westermann found the island already very close to the surface, and at the same time connected on all sides with the ground as a mountain-like swelling and not as a free-floating mass consisting of felted peat without vegetation. Near the first island was a second, but which was burst in the middle.

*Kersting adds that Wangenheim and Neese passed a sling below the floating peat and found the peat with slippery clay coating, causing the escape of the gases to be difficult. From the plants they have then found only two varieties of *Polygonum amphibium* and some *Spergula*. Obrist V. Brummer, the present manager of festivals, noted that this is an unusually warm summer, and even a part of the island was covered with some grass.*



Undated



Summer, 2013

The Ilzina today experiences floating islands of peat, but none that locals consider worthy of much note.

J. Letzmann's "Die Schwimmenden Inseln des Pastoratsees von Trikaten und Anderer Seen," Loodusuurijate Seltsi Aruanded 28 (1922) reports a brown mat of reed plant roots and rhizomes near the shore where no one had before seen an island. The island was as much as 50 centimeters thick, 12.5 meters long and 1 to 2.7 meters broad. Lake depth at that spot was 4.7 meters. The island was fixed to the bottom until the wind changed its direction and it broke free and floated farther offshore. The island was initially covered only with peat mud, but after two weeks, had turned green and a young willow was sprouting new leaves.

Letzmann notes a floating island in Lake Kavadi which rose in the beginning of July and could support a pair of people.

Commercial Statistics (1844), by John Macgregor, describes Latvia's Courtland Peninsula.

Nothing is to be seen but a barren desolate chaos overgrown by moss and rushes. Here and there rise a solitary pine or stunted birch. Where the ground has sunk and water collected over it, lakes are formed. These lakes sometimes contain floating islands -- pieces of the marshy soil detach themselves from the land, with all that may be growing on them, and the wind drives

them backwards and forwards between the opposite shores. The inhabitants fasten these islands now to one side, now to the other, according as they wish to graze their cattle.

Recent photos



Lithuania

Floating rafts are formed from the interlaced rhizomes of *Typha angustifolia* cover extensive areas of the 970 hectare Lake Žuvintas biosphere reserve.



Chapter 39 -- Say "Ujuv saar," "Eldoša sala," or "Plaukiojantieji sala."

Floating island in Lake Didziulis, photographed at 30-second intervals,



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The island approaching the near bank



From a 2013 tourism description of the town of Vepriai

The town of Vepriai prides on its festivals and fears floating islands in Vepriai Lake. In strong winds, peaty formations overgrown with bulrush and trees can travel quite fast and bring destruction to anything that happens to be in their way.

"Since the Soviet times, there was a statue of Neptune built in the middle of the lake. One day, an island swam by and knocked it down. We fished it out and put on the shore," Urbonienė recounts. "But the biggest threat is to the dam. If some island tears it down, our lake will swim away. On several nights, my husband and I would keep vigil near the dam, so that if an island approaches, we can let out some water manually."

At the moment, one of the floating islands is threatening to sweep away a beach that was so carefully tidied up by local people. The town elder once tied the island to a tree on the shore with a metal cable, but scrap metal hunters stole it. Then the locals "nailed" the island down to the lake floor with wooden poles. The disaster was averted for several years, until last autumn, when heavy rains flooded the lake, the island sailed off again.

"We wait with anxiety until the ice melts. What are we to do with the island? We might try to drag it away with a helicopter, because boats are no longer enough. God willing, the winds will be favorable and might blow the island away," Urbonienė hopes.



Vepriai_Lake

We depart the Baltic states with any number of floating islands not visited, but we've an appreciation for their profusivity.

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CHAPTER 40

SEEK MR. KURTZ

"In the interior you will no doubt meet Mr. Kurtz."

We steam upriver into the Dark Continent, the Africa of Victorian eyes. Mary Kingsley, in "Fishing in West Africa," National Review 29 (1897), provides an introduction.

Bits of the Congo Free State are great at seafaring, too, and, owing to the terrific stream of the great Zaire, which spreads a belt of fresh water over the surface of the ocean 200 miles from land, ships fall in with these floating islands, with their trees still flourishing.

But by no means every island gets out to sea; many of them get into slack water round corners in the delta region of the Ogowe, and remain there, collecting all sorts of debris that comes down on the flood water, getting matted more and more firmly by the floating grass, every joint of which grows on the smallest opportunity. In many places these floating islands are of considerable size. One I heard of was large enough to induce a friend of mine to start a coffee plantation on it. Unfortunately, the wretched thing came to pieces when he had cut down its trees and turned the soil up.

And one I saw in the Karkola River [Gabon] was a weird affair. It was in the river opposite our camp, and very slowly, but perceptibly, it went round and round in an orbit, although it was about half an acre in extent. A good many of these bits of banks do not attain to the honor of becoming islands, but get on to sand banks in their early youth, near a native town, to the joy of the inhabitants, who forthwith go off to them, and drive round them a stockade of stakes, firmly anchoring them.

"Floating Islands of West Africa," Marion Daily Star, November 20, 1886, mentions the islands floating on the Cross River of Nigeria.

Down the broad, sluggish Old Calabar river came slowly to meet us a long procession of floating islands, some of which were of considerable size, formed of wild grass and earth torn from the soft bank by the current, there enormous waifs are quite a common feature of the Lower Congo, and have occasionally been met with as far out to sea as the Portuguese islet of Anno Dom.

The Congo River

The quote with which we subtitle our chapter is drawn from Joseph Conrad's foreboding Heart of Darkness (1899). The novel's narrator, Marlow, journeys by derelict steamboat up the ominous Congo in search of Mr. Kurtz, an ivory trader who has withdrawn from society and become godlike to the natives.

The novel has been adapted for film a number of times, the photo to the right from a 1993 rendition.



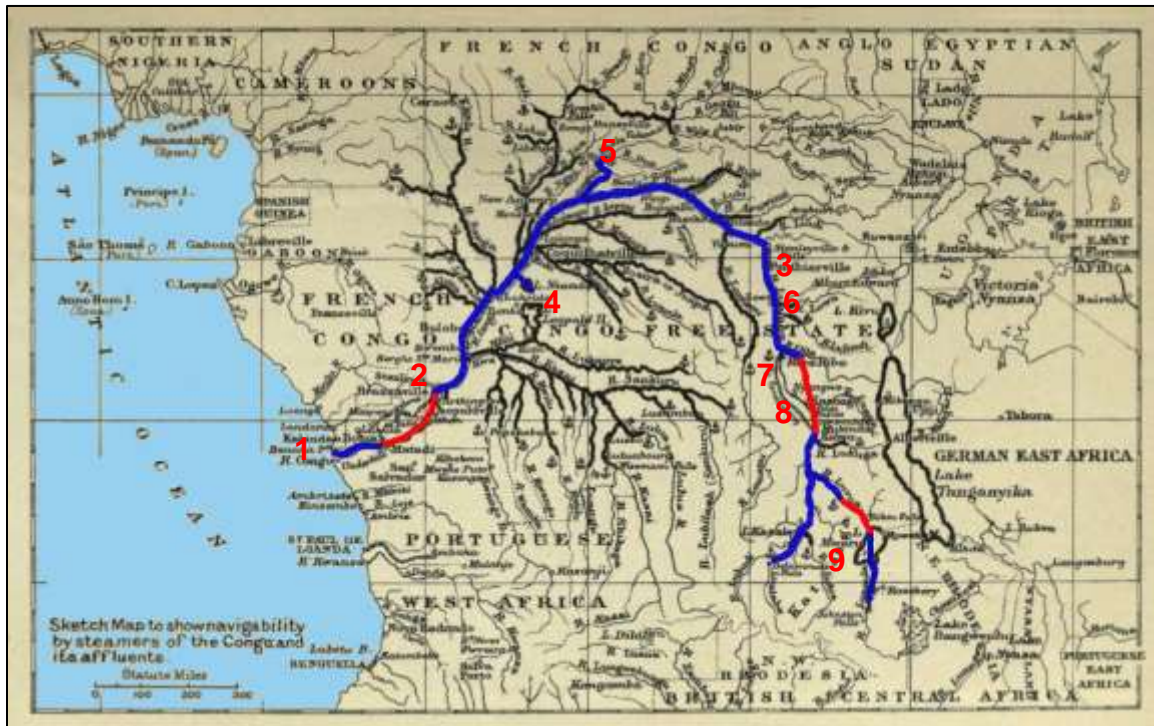
When Marlow at last encounters the recluse, now insane and dying, Kurtz whispers, "The horror! The horror!" an indictment of the continent's colonial savaging. To Conrad, there is little difference between those who think of themselves as civilized and those looked down upon.

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Our interest, however, is not that of debauched colonialism, but rather the river up which Marlow obsessively steers, a river of darkness, a foreboding vastness of nearly-impenetrable floating landscape.

Marlow travels overland to the Outer Station at the lower end of Stanley Pool, bypassing Livingston Falls and some 32 cataracts having as much potential power as all the rivers and falls in the United States, and continues up the Middle Congo, a 1,000-mile stretch, 9 miles wide in some parts, where his steamboat supposedly awaits. There, however, he finds chaotic devastation, inoperable machinery, demolition serving no apparent purpose, native men chained and wasted, guarded by one of their own in a uniform.

Below, 1908 Congo navigability by steamer. Blue indicates routes to sites discussed in this chapter. Red indicates non-navigable reaches, the 1-2 being Livingston Falls and 7-8, Stanley Falls, a 60-mile stretch of rapids.



- | | | |
|-------------------|-----------|-----------|
| 1 Coastal Station | 4 Tumba | 7 Kisale |
| 2 Central Station | 5 Ubangi | 8 Upemba |
| 3 Inner Station | 6 Lualaba | 9 Luapula |

Conrad's Inner Station is geographically speculative.

Going up that river was like traveling back to the earliest beginnings of the world, when vegetation rioted on the earth and the big trees were kings. An empty stream, a great silence, an impenetrable forest. The air was warm, thick, heavy, sluggish. There was no joy in the brilliance of sunshine. The long stretches of the waterway ran on, deserted, into the gloom of overshadowed distances... The broadening waters flowed through a mob of wooded islands; you lost your way on that river as you would in a desert, and butted all day long against shoals, trying to find the channel, till you thought yourself bewitched and cut off for ever from everything you had known once -- somewhere -- far away -- in another existence perhaps.

Once underway, the journey up-river to Kurtz's station takes two months to the day

At this point, we depart from Marlow's reflections of the Congo, and look to others, beginning with Annals of Philosophy, Or, Magazine of Chemistry, Mineralogy, Mechanics, Natural History, Agriculture, and the Arts, July 1818, by Thomas Thomson.

The loose texture of the banks of the river causes perpetual changes in the line of the coast and the direction of the currents, and frequently, small fragments of the matted turf are detached and float down the stream, with the cypress and other gramineous plants still remaining upon them. These, which appear to have been very inconsiderable in size, were magnified by the Portuguese into floating islands, torn off from the mainland by the violence of the torrent, and suspended by its velocity.

"Sketches in South Africa," The Knickerbocker, December, 1861,

The strong current often undermines and detaches large portions of the banks, which, being composed of thick masses of tangled mangrove-roots and under-growth closely matted together, come floating down the stream with all their vegetation upon them, presenting the appearance of thickly-wooded little islands.

Harry Johnston's The River Congo, from its Mouth to Bolobo (1884),

Stanley Pool is a great expansion of the Congo, about twenty-five miles long and sixteen broad. There are seventeen islands of some note, the largest of them being thirteen miles in length. Many sand-banks strew the waters of the Pool, alternately covered and uncovered, according to the season of the year, and there are also floating reed and papyrus islands, formed of these masses of aquatic vegetation, which are so strongly interknitted by their fibers and roots that a man can stand on them.

These floating islets are occasionally of some extent, and may be taken for real islands until their motion with the current is observed.... The large islands are resorted to by elephants and buffaloes, which creatures swim backwards and forwards from the mainland with ease.*

**These vary in size and number according to the season. In the rainy months they are subdivided into two or three each, with shallow channels between. In the dry season the number of islands is much diminished by the retreating waters.*



Johnston's "Floating Reed Islands on Stanley Pool."

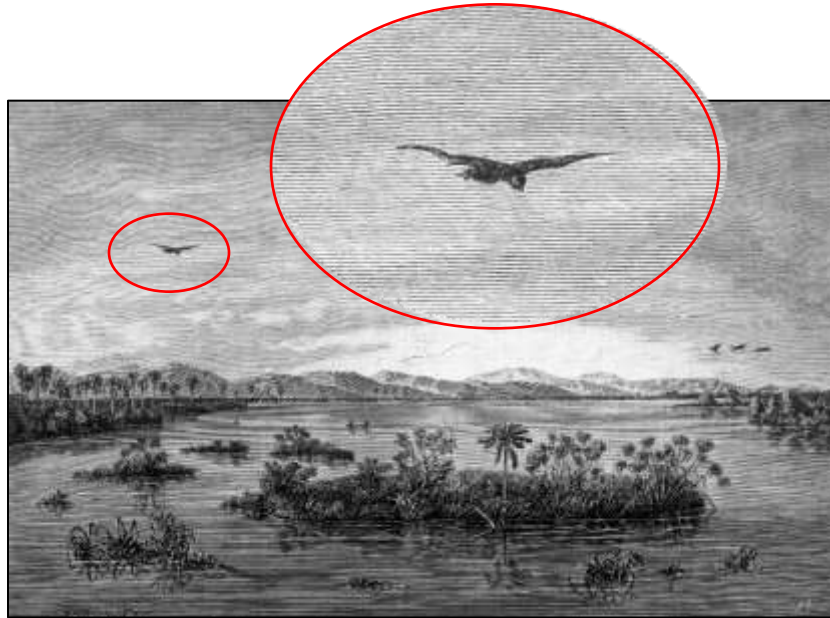
An International Protectorate of the Congo River (1883), by Travers Twiss,

The stream, during this period, is very rapid, and carries out to sea floating islands formed of the roots of various kinds of plants and covered with bamboo and grass; and as some of these islands are reported to be more than 100 yards in length, they are a source of danger to ships under weigh, and more especially to ships at anchor. Such are the somewhat inhospitable conditions of the entrance of this mighty river, which was formerly frequented almost exclusively by the European slave-dealer. The steamship, however enables the mariner of the present day to overcome the difficulties of the ascent of the Lower Congo, which were so formidable to the sailing ship.

A Sailing Directory for the Ethiopic or South Atlantic Ocean (1883), by Alexander Findlay,

The rising of the Congo occurs six weeks after the commencement of the rainy season, that is, about the middle of November; it then rises 8 feet, 9 inches above its ordinary level. The stream becomes very rapid, and bears along with it floating islands, formed of the roots of plants of all

kinds, covered with bamboos and grass ; these are very dangerous for ships under way, and especially for those at anchor. Some of them are more than 100 yards long.



Floating islands on the Congo, Brazza Expedition, 1879-1882, Les Explorateurs de l'Afrique (1890), by Paul Bory. A vulture flies above, perhaps inspiration for Marlow's reflection upon observing a fence of human heads impaled upon stakes.

Food for thought and also for vultures, if there had been any looking down from the sky.

Thomas Boteler's Narrative of a Voyage of Discovery to Africa and Arabia, Performed in His Majesty's Ships Leven and Baarracouta, from 1821 to 1826 (1835) mentions being frequently passed by small floating isles on the Congo, which, when covered with birds, have remarkable appearance.

"Scenes in Africa" Christian Union, August 13, 1885, describes the passage.

During the voyage, Mr. Grenfell and his companions were in considerable peril from the presence of a large floating island, "one -thousand square yards of floating grass and herbage, whose roots extended three feet or so in the water." A passage had to be made through it by hand-saw.

Lake Tumba covers about 760 square kilometers, connected via the Irebu channel with the Congo. Water flows into or out of the lake through this channel depending on the floods.

"Floating Islands of Flowers Peril African River Traffic," Elmira Star Gazette, September 13, 1955,

What started as an ornament has grown into a menace over wide area of the Congo Basin. Ships are held up by giant floating islands. Harbors and bays are clogged by flowery carpet; fishing grounds are blanketed.

Last month a floating island covering over 10 acres was blown by a strong wind into Bikoro Bay on Lake Tumba (Belgian Congo), while the villagers of the area were fishing. Scores of praus (native boats) were crushed and sank, others were pushed against the beach. Along the whole bay fishing became impossible.

Harry Johnston, in George Grenfell and the Congo (1908), describes an island pushing the vessel Peace two miles down the Ubangi, a Congo tributary, against her anchors before.

While anchoring at night on the Mubangi, the Peace was nearly swept off downstream by a huge floating island of vegetation coming athwart her bows and causing her to drag her anchors. Grenfell feared that his little steamer might in this way be forced under overhanging trees, or across some great snag : even with steam full up in the opposite direction to the current he could not prevent her being carried along by this floating mass of vegetation. At last the crew, standing on the island with hatchets and hand-saws, detached the tough roots of the floating vegetation from the bow of the Peace, and thus the steamer after being dragged for two miles got free and steamed back to the main Congo, her crew eager for supplies of food.

Conrad's Inner Station have been up the Lualaba, or Upper Congo, which in flood times is rife with floating islands.



One of such islands from
"Three Years' Travel in
the Congo Free State,"
Geographical Journal,
5:5, May 1895

Above the Lualabaq lise Lake Kisale, The Royal Geographical Society sent Lt. Verney Cameron in 1873 to further explore of that region in which Dr. Livingstone had spent 20 years. We quote from two chronologies of Cameron's progress.

The Achievements of Stanley (1878) by J.T. Headley,

He [Cameron] at length came to a village in sight of the lake, but there the wife of the chief forbade his farther advance. The husband was with Kasongo, and thither Cameron sent messengers to get permission to proceed to the lake, but could not obtain one. He sent some of his men, however, to it, who reported that a large number of natives lived on floating islands in it. These were made of large pieces of tingi-tingi, cut from the masses with which the shore is lined. On these, logs and brushwood are placed and covered with earth. Huts are then built and bananas are planted, while goats and poultry are reared upon them. They were usually moored to stakes driven into the bed of the lake, that are pulled up when the people wish to shift their locality, and lines thrown around other stakes, by which the heavy mass is slowly towed along.

"Africa," Encyclopedia Britannica (1888),

Lake Kisale, containing floating islands inhabited by people, was sighted, but Cameron was not permitted to sail upon its waters. Lions on friendly terms with villagers, deadly trees like the upas, and underground dwellings with rivulets flowing through them, were some of the marvels recounted to the Englishman by natives of apparent credibility as belonging to this region.

The Lake Regions of Central Africa: A Record of Modern Discovery (1883), by John Geddiem,

The matted growths of aquatic plants fringing its shores are cut off in sections, and towed to the center of the lake. Logs, brushwood, and earth are laid on the floating platform, until it acquires a consistency capable of supporting a native hut and a plot of bananas and other fruit trees, with a small flock of goats and poultry. The island is anchored by a stake driven into the bed of the lake; and if the fishing become scarce, or should other occasion occur for shifting his domicile, the proprietor simply draws the peg, and shifts his floating little mansion, farm, and stock, whither he chooses.

"The Monthly Record," Geographical Journal, September 1904,

Lake Kisale becomes, in the rainy season, an enormous marsh without definite limits, extending from the Lualaba to the Lufira. The floating islands, formed of papyrus and other vegetation, are a feature of the lake, as has been known since Cameron's time.

"The Monthly Record, Navigability of Upper Branches of the Congo" Geographical Journal, 24:3, September 1904,

A careful examination of the courses of the lower Lualaba and Lufira rivers, with a view to test their navigability, was made last year by a Belgian officer, Lieut. Lattes, and the results were outlined in the Mouvement Oeographique for April 10 and 17 last (with sketch-map). They show that the Lualaba is navigable by steamer between 9° 10' and 5° 20' S, although at high water some difficulties occur at the point where the stream makes its exit from Lake Kisale.

Lake Kisale becomes, in the rainy season, an enormous marsh without definite limits, extending from the Lualaba to the Lufira.

The floating islands, formed of papyrus and other vegetation, are a feature of the lake, as has been known since Cameron's time. The open water has a depth of 5 to 7 feet, and the lake may be considered navigable throughout the year to steamers drawing 3 feet and less.

"Congo," Encyclopedia Britannica (1910),

The river issuing from Lake Kisale is called Kamolondo; it has a width varying from 300 to 1000 ft. and an average depth of 10 ft. From Konde Rapids to those of Dia of 5° 20' -- a distance of 300 miles -- there is no interruption to navigation saving the floating masses of vegetation on Kisale at high water.

Edward Hodgson's Fishing for Congo Fisher Folk (1934) is a missionary's account.

Let us picture the lake towards the end of the dry season, when rain has not fallen for six months, and the water level has been going lower and lower each day, the surface getting more and more covered by the water lily leaves. The floating islands float no more but are firmly anchored in the mud of the lake bottom.

Satellite image of floating islands in Lake Kisale; the larger being 500 meters across.



Further upstream, Lake Upemba,



Lake Upemba below, Lake Kisale above



Upemba's "floating islands," such Mitala Island, have served as an informal settlement for refugees from the Mai-Mai conflict since 2006. Grass or reed mats form a place to eat and sleep.

The Mofwe Lagoon and the Luapula swamps are fed in turn by the Mbereshi River where floating sedge forms an east-west barrier. The indefinite shore is lined by a dense band of tall reeds. Fishermen paddle dugouts along between floating rafts of vegetation which change margins and shape frequently.

Meet Kurtz

And back to Conrad. Somewhere along the banks of this island flowage, the dying Kurtz, ponders his domain.

A modern adaptation of Conrad's work is the 1979 film Apocalypse Now, set on a macabre river of death in Viet Nam, in which an Army intelligence officer is sent to dispatch the deranged Col. Kurtz, portrayed by Marlon Brando.

It's impossible for words to describe what is necessary to those who do not know what horror means. Horror... Horror has a face... and you must make a friend of horror. Horror and moral terror are your friends.



Conclusion

The floating islands between us and Mr. Kurtz most are certainly not of the island variety floated upon by the two lovelies pictured in our introduction,

Always seeking a thrill, these two have found a wee floating island and have perched thereon and are floating along with it, waiting to see what will happen. And they look as delicious as the desert we love.

Not all floating islands bode such pleasantries.

CHAPTER 41

DUCK WHEN PASSING UNDER BRIDGES

Chapter 82 will deal with ways to attack and destroy a floating island, but lest we sound belligerent, it's only in retaliation.

A floating island can lodge itself against a bridge -- the piers if the water is low and/or the stringers if the water is high -- in two manners.

1. If the island is an integral mass floating with the current, the product of the mass and its rate of deceleration creates an impact which the bridge must withstand if it is not to immediately fail.
2. If the mass arrives not as a whole, but rather as an accretion, the buildup is known as "drift." As the debris accumulates, the force caused by backwater, shear and discharge having to squeeze under the impediment can be substantial.



Aorangi, New Zealand



Delhi, Minnesota



I-40, Tennessee

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Highway 301, Orange Lake, Florida



Burdekin railway bridge, Queensland, Australia



New York



Skidmore, Missouri



Oklahoma

Most bridge failures caused by floating debris occur not as a knock-out punch, but rather as the result of protracted drift accumulation until the buildup becomes, in effect, a floating island that overwhelms the interfering structure.

An Early Report

"A Stranded Island," Los Angeles Herald, March 18, 1899, from Pana Illinois,

A floating island, between one and two acres in extent and from four to five feet thick, has come down the Illinois River. It collided with a cabin boat and smashed in the keel and landed it ashore. The island struck a pier of the wagon bridge violently shaking the structure and throwing crossing horses from their feet. The island is now stranded between the pier and shore and the city authorities contemplate blowing it up with dynamite.

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Great Miami River, Ohio

While the 94-year-old Harrison Bridge was being replaced in 1989, traffic was shunted onto a one-lane temporary crossing. When flooding threatened and engineers were moving to close the road, an island of drift, including parts of a boat and dock, struck the pylons, causing a 140-foot section to collapse. A passenger vehicle plunged into the water, killing both occupants.

The National Transportation Safety Board found that:

Witnesses reported an unusual amount of debris floating down the river and striking the pile bents of the bridge prior to the collapse

At a combined impact and accumulated debris load of 7.5 tons, plastic hinges would begin to form.

Collapse would occur when a critical number of plastic hinges had developed throughout the substructure, at a combined impact and accumulated debris loading between 11 and 12.5 tons.

The collapse of pile bent 2 resulted from the formation of plastic hinges due to a combination of impact and accumulated debris loading on the upstream side of the pile bent

The designer of the temporary bridge believed that the structure's 3.5:1 vertical load factor of safety would accommodate any lateral loads that the bridge would experience. As illustrated by the collapse, an increase in the vertical load capacity may not result in a similar increase in a bridge's lateral capacity.

Oshkosh, Wisconsin

Construction of locks and dams in Lake Butte des Morts, just upstream of Oshkosh, through the 1800s led to riparian marshes and shallow littoral areas constriction the Fox River, the hour-glass constriction at Oshkosh between Lake Butte des Morts and Lake Winnebago

The winter of 1905-1906 varied from severe cold to frequent mild thaws, causing the Lake Butte des Morts bog to break loose in April and drift with the wind and current. More than 350 acres of bog, driven by a strong northerly wind, clogged the Fox River and destroyed a section of the Algoma Street Bridge. Oshkoshians feared for the city's other bridges, piers and buildings along the river. Men in rowboats used poles, hooks and dynamite to dislodge the buoyant mass. Gradually it broke up and drifted into Lake Winnebago where the remnants beached or sank.

Chapter 41 -- Duck When Passing Under Bridges

Algoma Bridge, 1890



Below, floating islands lodged against Oshkosh Avenue Bridge, 1906.



For its detail, "Marsh Bog is Moving," Daily Northwestern, April 9, 1906,

Bog land forming about 300 acres of Butte des Morts marsh is afloat and at any moment may be carried down the Fox River to Lake Winnebago to the danger of the several bridges spanning the river in this city.

Such is the startling statement made here today by E. L. Benedict of the village of Butte des Morts who came to Oshkosh this morning in an endeavor to secure a pile driver with which to sink piles into the bog with a view of authoring it until it can thaw out sufficiently to settle down and anchor itself.

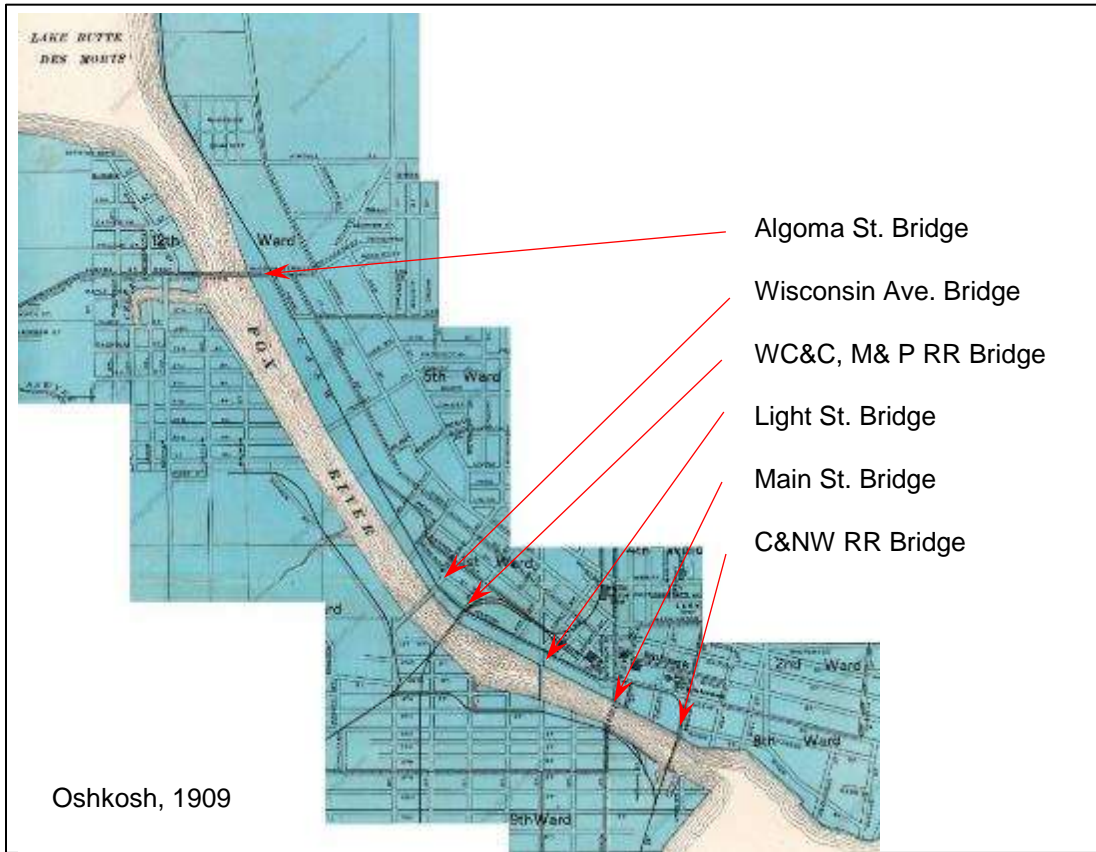
Mr. Benedict notified Mayor Banderob of the unusual and dangerous conditions and Oshkosh citizens are cooperating with Butte des Morts residents as it is realized that should the marsh bog float down the swiftly moving Fox, it would do much damage to the local bridges.

West Algoma Bridge would receive the full force of the impact and is therefore in serious danger. With the current in the river moving at a rate of about six miles an hour, this frozen, floating bog would gain a great momentum and there is no telling how much damage would be left in its wake as it forced its way in a pushing, grinding mass down the swollen river. It is probable that all of the bridges would be more or less injured, among them the new Main street structure, which is practically completed but has not as yet been accepted by the city.

These are the bridges that are endangered by the threatened movement of the huge bog: Algoma passenger bridge at West Algoma street, near the plant of the Paine Lumber company; Wisconsin Avenue Bridge; combination Wisconsin Central and Chicago, Milwaukee & St. Paul railway bridge, recently constructed; Light Street passenger bridge; new Main Street passenger bridge, built at a cost of over \$100,000; Chicago & Northwestern railway bridge, located near the mouth of the river.

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For reference,



According to the statement of Mr. Benedict, the Butte des Morts bog is now on the move, about 300 acres of the spongy land with its masses of, marsh grasses and peat having become loosened by the rapidly rising river and floating slowly out into Lake Butte des Morts. This remarkable state of affairs is decidedly unusual, a like danger never before having been encountered, so far as Mr. Benedict knows.

It is stated that the breaking away of the bog is due to the rapidity with which the river has risen this spring, the waters rising so fast that the marsh has had no time to thaw out. Consequently the entire expanse of marsh land has been treed and is floating. The water at Butte des Morts is said to be as high at present as is usually the case in June. Ordinarily, in the spring the water rises slowly and the warm weather thaws out the marsh so that there is no danger of its floating, the marsh instead of breaking away, becoming submerged.

Today the wind from the southeast is all that holds the bog from taking a trip down river. The wind is about equal to the force of the current the warring forces counteracting each other. Even under the fortunate conditions today the bog has moved a little and about 150 acres of it has been carried about half a mile into Lake Butte des Morts. Should the wind veer to the western point of the compass, there is nothing to keep the huge marsh from moving out into the lake and down the river, as the wind and current working together would give the great mass a momentum that would have a most destructive result. Should the wind from the southeast die down, the result would also be most serious as then the current of the river would have no counteracting agency to struggle with.

"Bridge House Falls: Breaking Away of Bog at the West Algoma Bridge Topples Bridge Tender's House and It Is Carried Down River," Oshkosh Northwestern, **April 11**, 1906

Shortly before 2:30 o'clock this afternoon the West Algoma bridge master's house was carried out by a movement of sixty-odd acres of bog. Piling was torn up like match sticks, it is said, and the bridge house toppled over on the bog and was carried downriver as far as Hollister Amos mill. Crews of men are guarding the Wisconsin Avenue Bridge, the fear being that more of the bog will go down river in large masses. Fears are felt for the safety of the bridge piling at West Algoma.

"Bog Jam Continues," Daily Northwestern, April 12, 1906,

Carrying Away of Bridge Tender's House at West Algoma Bridge Shows Power of River Current -- Portions of the Jam That Go Down Stream Pile Up at Other Bridges

It was stated at the bridge Wednesday afternoon that not to exceed eighty acres came down the river when some of the marsh floated away in 1882, while the total area of that already past Oakwood and Sunset points in Lake Butte des Morts this year is more than 350 acres, according to a conservative calculation. This means more than a half section of land, good hunting grounds, excellent fertilizer, but valuable for little else, all detached from its natural position and the head of the lake and sent floating down to the river again and thence to Lake Winnebago.

While it was thought Tuesday evening that the worst part of the jam above the bridge was over, the accident to the "shanty," otherwise known as the summer residence of the bridge master, demonstrated that the pressure of the bog might be greatly augmented at times, the additional pressure being a matter of much moment. The manner in which the dozen piles supporting the house were torn away indicated that the strength of the bog when exerted in certain ways is enormous, and that watch must be kept, lest serious injury be done to the bridge itself. Two of the protection piers, the timber cribs and anchor stone, have practically disappeared from view in the bottom of the river, so that for the last forty-eight hours there has been opportunity for a sudden movement of the bog downstream to exert a great force on the stone piers of the bridge.

The thing which caused the most alarm to persons especially interested Wednesday was the fact that there remained at that time not more than two miles up the river a quantity of bog which had not yet joined the main "attacking force" at the city limits.

During the night the greater part of this mass was carried along and added to the bog in the river, driving the latter still further downstream, causing jams at the Wisconsin Avenue bridge and Wisconsin Central and St. Paul railway bridge.

A reporter from the Northwestern took a boat from the Oakwood summer resort Wednesday afternoon and made a tour of inspection around the shores of the lake, and found that the rumors of "a hundred acres or more" were easily verified. While there do not appear to be any sections of large marsh ornamented with trees or willows, there were at the tip two sections of loose bog on one side of the river, and one on the other, waiting favorable winds to drive the, into the lower river. These three were altogether about 120 acres in extent.

On the west side below Oakwood and above the bay of what is known as Sturdevant's marsh, there was a patch of marsh about half a mile long and several hundred feet across. This was held against the shore by the upper end of the west "bull-pen," as it is known, a double line of piling forming a hollow square from the grounds of the Algoma Country Club a mile or more up river.

A south wind, shifting sometimes to the west, could not have done otherwise than move this large mass into the main stream and send it after the preceding tracks of marsh now either in the river or in Lake Winnebago.

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There were also three floating tracks of several acres each, all covered with muskrat houses and holding much honeycombed ice in big pockets.

On the eastward shore, just below Sunset point, about sixty acres in one section had lodged, after being blown on a circuitous westward and then south from its former location in the big lagoon along the west shore and out of the Oakwood bay across to Sunset. The mass was barely anchored by shoals near the Sunset property, and appeared to need little help to move on down.

[After the island hit the] the West Algoma bridge Wednesday afternoon, taking the bridge tender's house with it, a jam formed above Wisconsin Avenue bridge, and President W.A. Marden of the board of public works took a crew of man and hurried to the lower bridge, reaching there with pike poles in time to break up the obstruction piece by piece and made considerable progress in cleaning it. Two boat houses above the Wisconsin Avenue bridge were torn from their moorings and carried downstream a short distance. No further harms was done, however.

This morning, by the influx of upriver bog at this point, a jam had been formed above the "twin bridges" of the Central and Milwaukee roads, extending up above Wisconsin Avenue Bridge.

Harlow Lawrence and another man engaged by the Superintendent of Bridges William McCourt had a narrow escape from immersion in the swift waters of the river at the time of the accident to the bridge house. They were on a scow tied to the bridge, and an instant after the house was carried out on several acres of bog, another section of frozen earth and water follow it, tearing the moorings of the scow and pushing the craft with speed toward the section carrying the shanty. As the larger "raft" was going at a speed of two or three miles an hour greater than that of the other, a rear-end collision was imminent, and it was only by the hardest kind of sculling that the occupants of the scow managed to get out of the way and the scow escaped being crushed as the two masses smashed together.

The Fox/Wolf Rivers Environmental History Project commissioned Jason Moon in 1997 to write a song for an educational project, The River Rocks. "The Day They Blew up the Bog" describes the destruction of bogs that floated down the Fox River into Oshkosh in the early 1900s. The chorus,

*Blew up the bog 'cause the water wouldn't flow,
Blew up the bog 'cause the boats wouldn't go,
Blew up the bog 'cause the people didn't know.
Grandpa cried when they blew up the bog.*

While the event of 1906 holds the record for destruction, it by no means was the last of the invasive floating islands. In September 1938, there were as many as 25 or 30 pieces of bog, some as large as half a city block, floating down the Fox River per day.

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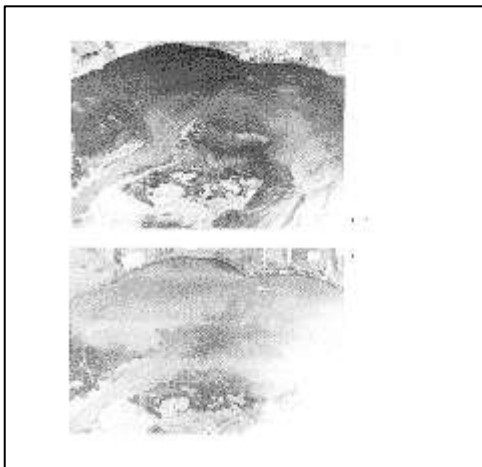
Floating islands in Lake Butte des Morts, 1969



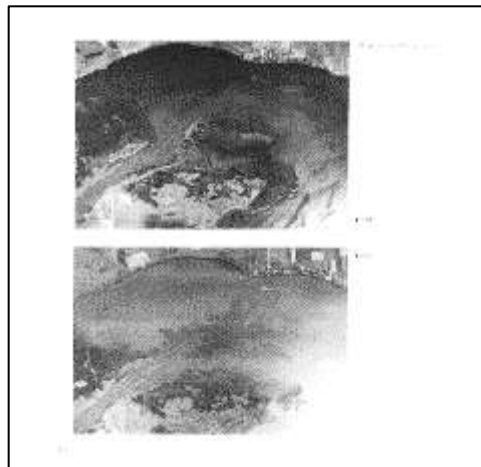
The problem has lessened recent years, however. By the later-20th century, however, emergents and submerged macrophytes had largely disappeared, returning the lake to its original openness, and thus diminishing the source of floating islands.



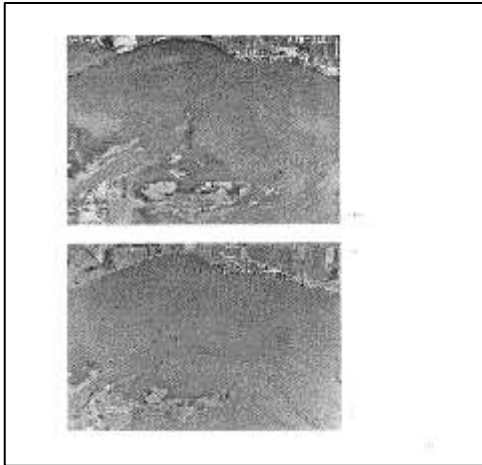
Lake Butte des Morts shoreline, 1941



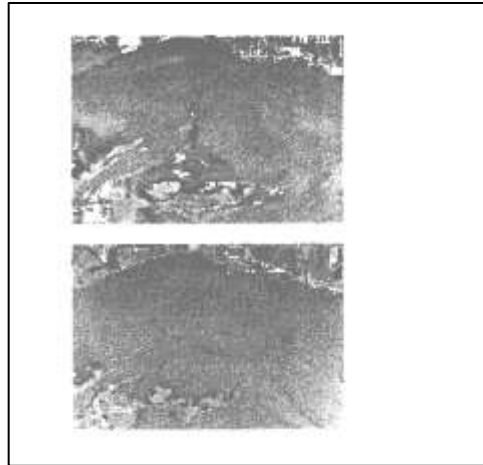
1950



1957



1964



1971

But there will always -- at least to some degree -- be the floating bits of Lake Butte des Morts mat, as evidenced by a posting from Andrew Sabai, May 14, 2012

High water over the last week and a half is taking its toll on both wildlife and habitat. Those familiar with habitat on the Winnebago Upper Pool Lakes know that thousands of acres of marsh have been lost because of the breakup of floating "bogs." When water rises the intertangled roots that form a sort of sod rip from the underlying soil and float.

During high winds or ice break up in spring, these mats break off and float down and usually disintegrate in Lake Winnebago. When there was more marsh hundreds of acres could be lost in one event. Friday a steady wind developed and began ripping the marsh apart one small piece at a time. I witnessed a dozen of these small mats floating within the break wall at Terrell's Island and coming out of the Fox River at Lake Butte des Morts.



St. Johns River, Florida

The original Osteen Bridge, a manually-operated steel and wood swing structure 14 feet wide, was built in the 1920s on Florida's St Johns River between Lake Monroe and Lake Jesup, and rebuilt in 1947.

By the 1970, the structure had proven to be too dangerous and too narrow, "the worst bridge in Florida," according to the locals.

In 1973, mats of water hyacinth damaged the pilings.

The current bridge, 2300 feet long and high above the passing islands, was completed in 1977.



Pakwach Bridge, Uganda

From "Nile Blocked at Pakwach," New Vision, January 8, 2003,

Massive papyrus sudd floating from Lake Albert have blocked the River Nile at the Pakwach bridge, raising fears of flooding.

Works, transport and communications minister John Nasasira yesterday said Egyptian and Ugandan engineers who had been clearing Lake Kyoga of the sudd had rushed to the scene, the main gateway to the West Nile region.



The water flow towards the Sudan has also been greatly affected by the floating island (sudd), estimated to be covering a 100-meter distance.

Nasasira appealed to the people of West Nile to be patient during the exercise which he said was necessary to avoid the West Nile region from being cut off.

"The situation is very serious. The sudd have swept several canoes and fishing nets of our people thus affecting the living standard of the people," Pakwach Town Council mayor Hophny Topacho Ongiertho said.

He said the sudd caused flooding on the southern part of the river, while the northern section was drained resulting into a serious water problem along the banks.

Several people living along the river-bank from Pakwach town to Wadelai, about 17 miles, have been displaced. The town council is also affected.

Topacho blamed the works ministry for failing to maintain and renovate the longest bridge in the country, which was constructed with the assistance of the East African Community in 1969. The bridge's main pillars are cracked.

But Nasasira said the contractor working on the Nebbi-Pakwach Road would handle the repairs.

There are now fears that the marauding Lord's Resistance Army (LRA) rebels could use the compact sudd to cross into Nebbi district and avoid the bridge which is guarded by the UPDF.

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From "Uganda: Pakwach Bridge Cleared of Papyrus," New Vision, January 24, 2003,

Over 3,000 square meters of papyrus sudds which had blocked River Nile at Pakwach bridge has been cleared, leaving an open section under the bridge, reports Ayiga Ondoga.

A team of engineers from Uganda and Egypt cleared the sudds but a large mass of the sudds remain uncleared on either side of the bridge.

Awoja, Uganda

The Awoja River flows southerly from Lake Bisina to Lake Kyoga.

Completed in 1957, the 60-meter composite-deck bridge crossing the Awoja, under-designed and shoddily constructed, was regularly flood-damaged for some 30 years before it was reconstructed in 2009 with seemingly the engineering acumen and quality control of the original.

The rebuilt structure, buffeted by floating sudd, collapsed the following year.



Photos from 2010, the one to the right, evidence of under-reinforcement.



"Floating Island Destroys Soroti Water Pump Station," an unattributed news item posted in 2011,

Soroti water pump station, the main piped water source for Soroti, Kaberamaido and Amuria towns, has been destroyed by a floating island. The water pump station is located at the Awoja Bridge.

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Last evening a floating island in Awoja swamp, about 30 acres in size in Awoja swamp drove a huge volume of water into the station, blocking the bridge and causing the water levels to rise. The floating island of weeds and papyrus finally hit the bridge, blocked off water and caused the pump station to collapse.

As part of "Post Flood Rehabilitation of Rural Roads and Social Infrastructure in Northern Uganda" program, the European Union agreed in 2011 to finance new abutments, two piers, the deck, removal of the old structure and realignment of access roads, but two years later withdrew further funding due to nonperformance of contracted tasks.

Bayou Des Allemands, Louisiana

From A Second Visit to the United States of North America (1849) by Charles Lyell,

The natural tendency of the islands is to drift toward the gulf and when, the Hymelia crevasse begins to empty its full force into the Gulf of Mexico, ship captains navigating that body, of water are likely to be confused by discovering new lands and tropical islands where the charts show none. For the present, however, the flotants are proving most troublesome to the railroads in threatening their bridges. So many islands have floated down Bayou des Allemands as to endanger the big bridge of the Southern Pacific over that stream.

The railroad company has a large force of men near the bridge. They have driven piles and built up a network above it to catch the floating islands, which are blown up, cut up-or otherwise destroyed, so as to prevent them from floating against the bridge and wrecking it.

Report, Part 2, United States. Army. Office of the Chief of Engineers (1909)

During August the Hyacinth operated in Bayou Des Allemands and its tributaries, Bayou Boeuf, and Grand Bayou. The plants have formed a jam at the railroad bridge over Bayou Des Allemands, and the Hyacinth succeeded in breaking the jam by working through the draw and moving the plants by her wheel. Freshets assisted in carrying the plants out of the streams. About 295,000 square yards were removed from Bayou Des Allemands in this manner.



Bayou Des Allemands Railroad Bridge today, not that much different than it was in the Civil War.

In Chapter 77 "The Floating Island of Murdock's Pond" tells of efforts to tow an island formed from a mass of logs washed into a cranberry bog in Maine. Such an island, however, tends to have a mind of its own, and thus the outcome.

It might have gone farther, if it had not been for the stone bridge across the outlet. No mortal eye saw the catastrophe, but it must have been a grand sight as the mass swept against the bridge with a tremendous crash. For a time it dammed the stream until the force of the water pushed the island literally up on edge, then it fell asunder burying the structure of the bridge with logs, trees and general debris and smashing the summer house and other island "improvements" to atoms in the general wreck.

It cost the county of Hancock over one hundred dollars to clear the bridge and highway, and to this day strangers inquire as to the origin of the immense pile of decayed logs about the Rocky Brook Bridge.

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Grand Rapids, Michigan

Floating islands of artificial origin, the timber rafts of Chapter 27 can pose grave peril to bridges. In a single day in 1883, 150,000,000 board feet of timber broke free of its floating containment above Grand Rapids, Michigan, and crushed the Detroit Grand Haven & Milwaukee railroad bridge and took out spans of the Grand Rapids & Indiana and the Chicago & West Michigan railroad bridges. Only the Lake Shore & Michigan Southern bridge survived the onslaught of logs.

The following passages from "The Great Logjam: The Story of One of the Most Terrific Battles in the History of American Industry," Frank Leslie's Popular Monthly, July 1901, by Stewart White, describe the calamity.

Probably the biggest jam in the history of logging occurred in the Grand River of Michigan in the summer of 1883. It involved over one hundred and fifty million feet of logs. It is a little difficult to convey an idea of an hundred and fifty million feet. Such a mass would weigh, for instance, about thirty-seven million tons. If piled evenly ten feet high in a river bed a hundred feet wide, it would extend about ten miles. Singularly enough tremendous day and night efforts were put forth, not to break the jam, but to hold it. The men in charge knew that, once this tremendous force should get beyond control, nothing short of a miracle would prevent it from sweeping through everything and scattering abroad over Lake Michigan.

The D&M bridge, fortunately, was a new structure built entirely of iron. Should it be carried out, however, nothing could prevent the jam from sweeping away the other and lighter structures downstream. Then it was a clear race from Grand Haven. No one was sanguine enough to imagine for a moment that the wooden defenses at Grand Haven would oppose even a momentary barrier to the shock. The result would be that all the hundred and fifty million feet of the combined booms would sweep out into Lake Michigan, there to be irretrievably lost.

The most strenuous efforts, then, were concentrated on the new iron bridge. It was a massive structure, each of whose bents weighed over a hundred tons. Braces of oak beams were at once slanted where they would do the most good; chains strengthened the weaker spots, and on top and all about ton after ton of railroad iron held the whole immovably. It did not seem possible that any force could stir such a mass.

The jam extended up river for over three miles, but fortunately floated. If it had jammed to the bottom of the river, the water would have backed up behind it as behind a dam; but now, luckily, the river had a clear channel below the log's and the bridge. A slight fall of the stream would suffice to lock the affair beyond the possibility of accident.

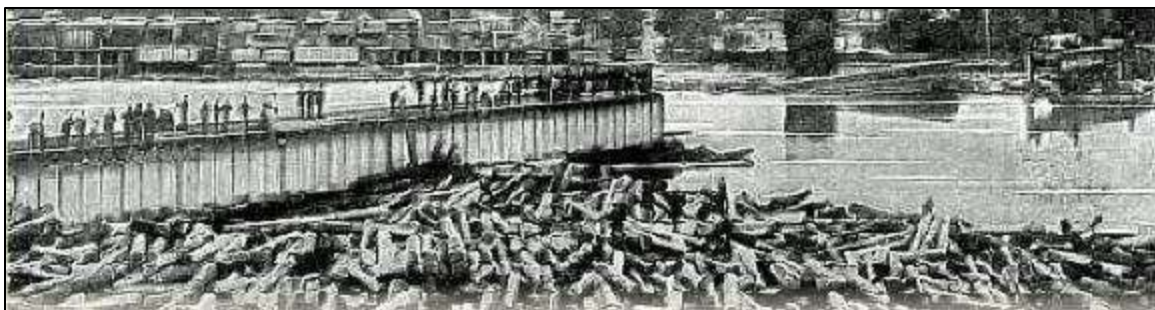
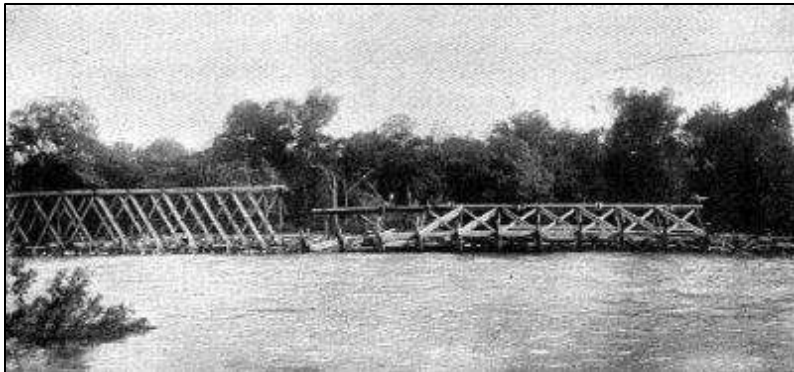
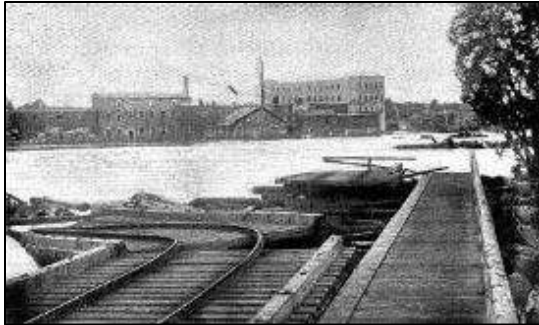
Then, without the slightest warning, in seven minutes, the jam gathered its might and carried away the elaborate defenses as though they had been made of straw. Old man Jinby rode frantically into Grand Rapids, like a second Paul Revere, screaming out that the flood had broken loose. The other railroad bridges with the exception of the Lake Shore, did not even offer a check. Five hours later about half of the logs boiled into sight at Grand Haven, fifty miles away.

It is impossible to describe the excitement and consternation that reigned in Grand Rapids as the rushing timbers shot down the current past the city. No old-established country could ever understand it. Destruction threatened not only men's fortunes, but their very life-work in building up a community. As the heavy iron bridges one after the other crumpled up like matchwood and were borne out of sight downstream on the very top of the jam, no one for a moment entertained the hope that anything could stop the rush this side of Lake Michigan.

So tremendous was the pressure at this time that here and there over the surface of the jam single logs could be seen popping suddenly into the air, propelled as an apple seed is projected from between a boy's thumb and forefinger.

The destruction in pictures.

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A Few Others

"Floating Islands Menace a Bridge," Minneapolis Journal, August 28, 1906, is about Minnesota
Queer sight is witnessed by Sauk Center citizens.

Acres of Soil with the Trees and Vegetation Undisturbed Are Washed into Sauk Lake. Old Ashley Picnic Grounds Actually Moved into the Town.

The bridge across the outlet of Sauk Lake was threatened with destruction Sunday and Monday. Several hundred excited citizens were engaged in a heated argument whether several acres of soil with the vegetation attached thereto, which had been carried down from the upper lake, constituted real or personal property.

On account of the high water and the high wind portions of the land around Ashley creek are being washed into Sauk Lake and in such large portions that the vegetation and the trees have not been disturbed. About four feet of earth still clings about the roots.

These floating islands came down the lake in three sections each containing between two and three acres and came with such force that the boom logs and chains were broken.

Argentinian newspapers document bridge damage from floating islands. "Los Restos del Puente Colgante Afrontan Nuevamente la Accion del Enemigo Secular," El Litoral, February 4, 1987, is about camalotes (Chapter 28) on the Rio Parana damaging a bridge "La Bajante Trajo Alivio a Algunas Provincias Anegadas del Litoral," La Nacion, May 27, 1998, describes a 14-hectare camalotes on the same river that washed away a railroad bridge.

For the Engineers

We'll end our discussion of unfortunate bridges with a note regarding the forces upon them.

"Problemes Poses par les Papyrus au Lualaba Superieur," Academic Royale des Sciences Coloniales, Bruxelles, Bulletin des Seances 3.6 (1957), by C. Camus, proposes an alternative calculation for the lateral load F exerted by a floating mat on a bridge.

$$F = \left[(\varphi_1 A + \varphi_2 B) \left(\frac{n}{n-1} \right)^2 + \varphi_3 B \left(\frac{1}{n-1} \right)^2 \right] \frac{\gamma V^2}{2g} + F_w$$

$$n = \frac{H}{T}$$

$$\varphi_1 = 1 + \frac{0.21}{\sqrt{\frac{nV}{n-1}}}$$

where,

- W is the width of the mat
- T is the thickness of the mat below the water surface
- A is the vertical cross-section of the mat below the water surface, WT
- L is the length of the mat
- B is the streambed area under the mat, WL
- H is the upstream water depth
- V is the velocity of the current without interference
- φ_1 , φ_2 and φ_3 are coefficient of resistance,
- γ is the specific weight of water
- g is the acceleration of gravity
- F_w is wave resistance

An example, the thrust of a floating mat lodged against a bridge in which W is 80 feet, T is 2 feet, L is 80 feet, H is 10 feet, V is 5 feet/second, φ_2 is 0.4, φ_3 is 0.2 and F_w is insignificant. The result: F is 26,800 pounds.

The above method has two shortcomings:

- The coefficients φ are not independently known.
- Momentum and channel slope are ignored.

A better solution is based on both energy and force balance, in which downstream-directed forces equals the upstream-directed forces acting on the water under the island,

Upstream hydrostatic force Weight of the water, slope component Change in momentum due to contraction	=	Downstream hydrostatic force Shear resistance, channel perimeter Shear resistance, island underside
-------------------------------------------------------------------------------------------------------------	---	-----------------------------------------------------------------------------------------------------------

The bottom force on the right is transmitted against the bridge, and can be solved knowing channel slope, Manning's roughness for bed and mat, and the water depth downstream, all knowable. The force can be estimated by bridge-hydraulics software. An as-built bridge plus a floating island is just another kind of bridge, albeit one with more head loss and more shear (which translates to scour potential) on the channel wetted perimeter.

Redoing the example problem from this basis, F is 32,600 pounds. Bed shear without the island is roughly 2.5 pounds/square foot. With the island, the value increases to 4.1.

As the results are sensitive to assumptions, the example results are at best approximate, but the magnitudes lead to qualitative realizations.

1. Accumulated debris can exert significant force against a bridge.
2. Bed scour significantly increases below the floating obstruction.

Both methods show that the load increases directly with the length of the mat, a fact clearly recognized in some of the accounts earlier in this chapter in which laborers were dispatched to break apart the debris before the mat grew too big.

CHAPTER 42

AVOID THE JAGUARS

We'll discuss more of the menacing menagerie ferried on floating islands in Chapters 43-45, but we'll first grant a chapter to the most notorious passenger, the jaguar.



(We'll also mention a large hamster and a big ant, but only after we deal with the nan-eating cat.)

Charles Darwin's Voyage of HMS Beagle (1939) contains his October 12, 1833 journal entry from his journey down the Rio Parana. From that entry,

The Parana is full of islands; they are all of one character, composed of muddy sand, at present about four feet above the level of the water; in the floods they are covered. An abundance of willows & two or three other sorts of trees grow on them, & the whole is rendered a complete jungle by the variety & profusion of creeping plants. These thickets afford a safe harbor for many capinchas & tigers. The fear of these latter animals quite destroyed all pleasure in scrambling in the islands. On this day I had not proceeded a hundred yards, before finding the most indubitable & recent sign of the tiger. I was obliged to retreat; on every islands there are tracks; as in a former excursion the "rastros" of the Indians had been the constant subject of observation, so in this was the "rastros del tigre".

When the floods drive the tigers out of the islands; they are most dangerous. A few years since a very large one entered a church at St Fe. Two padres entering one after the other were killed, a third coming to see what was the cause of their delay, escaped with difficulty. The beast was killed by unroofing one corner of the room & firing at it. The tigers annually kill a considerable number of young oxen & horses. These islands undergo a constant round of decay & renovation. In the memory of the master several large ones had disappeared, others again had been formed & protected by vegetation.

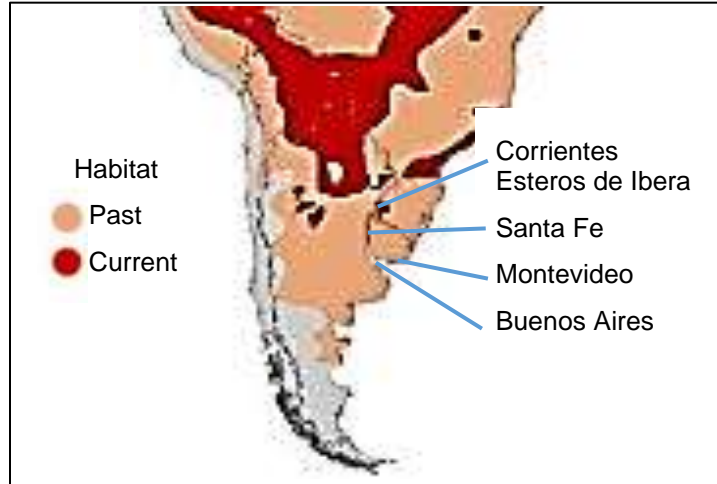
Darwin, in fact, misidentified the feline; the "rastros del tigre" was walked not by tigers, but by jaguars. Both are within the *Panthera* genus, but the former is for the *Tigris* species, while the latter is of the *Onca*. Tigers are not native to the Americas, but widely distributed throughout Africa and Asia. Jaguars are exclusive to the New World. European explorers saw the "yaguara" (the Tupi-Guarani term) as an American tiger -- a colloquial description still encountered -- and Darwin seems to have added the American animal to the catalog of subspecies. In Darwin's time, there were nine of the latter; there are but six today. Though he made no assertion to the effect, a subspecies uniquely adapted for swimming would have supported his evolutionary model.

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The naming juxtaposition yet occurs in South American, where "tigre" is universally understood to be the fearsome feline.

Darwin does not explicitly assert how the "tiger" arrived at the church of St. Fe, but he brackets the tale between remarks regarding floating islands, and both 19th-century South American folklore and journalism were rife with similar tales.

The map to the right indicates jaguar habitat in pre-colonial times, and the much reduced habitat of today. Also shown are locations referenced in this chapter.



Corrientes, 1817

John and William Robertson, Letters on South America; Comprising Travels on the Banks of the Parana and Rio de la Plata (1843) provides an early account, this one dealing with the arrival of a "tiger" on the Parana at Corrientes.

In great swellings and risings of the Parana, as we have had occasion to remark, masses of vegetable matter get detached from the islands, and come floating down the stream, while it some- times happens on these masses, or camalotes, that tigers descend, confused and frightened on finding the island going down the river with them.

Such a camalote in June 1817 came down the Parana, and was thrown by the current upon the river side, close to the port of Corrientes. An immense tiger descended with the mass and on being brought up by the river bank, the frightened animal walked on shore and directed its footsteps towards the town. Fortunately the occurrence took place just at the dawn of day, when no one was astir otherwise the consequences might have been disastrous.

In the tiger's proceeding to the town there was nothing extraordinary; such a thing had happened before, but it was somewhat singular that the tiger passed many other houses and advanced to the very heart of the city. The animal's course was interrupted by a low wall which ran round the garden at the back of Don Ysidoro's house, and accordingly, springing over the wall, the tiger made the premises of Don Ysidoro the termination of its journey!

Walking up the center of the garden, towards the family mansion, the fearful visitor came to some small out-houses of which the gables formed one side of a small inner court belonging to the house. In one of these out-houses slept the unfortunate Paulista capataz. His door was standing open; he had just got up, and was sitting on the side of his bed in the act of dressing; the tiger looked in, glared and in an instant sprung upon his victim.

In the meantime it luckily happened that a man had seen the tiger just as it was vaulting over the garden wall, and he instantly ran to the front of Don Ysidoro's house, and thundered at the door.

The word "Tiger," vociferated by the informant, instantly caught Don Ysidoro's ear. He sprung from bed, heard of the fatal entrance, and now surrounded by his servants, hastened to the court which I have already mentioned. Through a crevice in the gable wall of the room where the capataz lay, his master distinctly saw the unfortunate man stretched on his bed, motionless and covered with blood, while the tiger, with glaring eyes, stood over him. To open the door into the outhouses, and to give the tiger an opportunity of rushing upon them would have been madness. Don Ysidoro, therefore, sent a messenger to the guard-house in the Plaza mayor to bring over instantly three or four soldiers with loaded muskets. In the meantime he made an aperture in the wall as nearly as possible on a level with the tiger's head. It heard the noise, gazed on the spot, but moved not. Don Ysidoro gently called to the capataz who just moved one finger to show that he was alive, and again lay with the stillness and stiffness of death. All was right; Don Ysidoro took one of the muskets, the best, assured himself that it was loaded; got the muzzle in at the aperture; and with his old and wonted precision he sent the ball right into the head of the animal, which instantly fell dead on the body of the Paulista tiger hunter.

The poor fellow was dreadfully lacerated, but his wounds being dressed, the doctor expressed his hope that they would not prove fatal.

The news soon spread through Corrientes that Don Ysidoro had killed a tiger and at an early hour Mr. Postlethwaite and I hastened to the scene of action. There stood Don Ysidoro, in the center of his front patio or court, surrounded by his friends, and the huge tiger lying stretched at his feet. Our friend glowed with excitement and animation, another Wellington with the laurels of Waterloo fresh about his brows.

The particulars which I have given we obtained from Don Ysidoro himself. Happily the Paulista recovered; and the tiger's skin, one of the most magnificent I ever saw, having been stuffed to the life with yerba, thenceforth adorned the hall of Don Ysidoro, the last and best of his trophies as a tiger hunter.

Santa Fe, 1825

Darwin was passing on the tale of an event having taken place Franciscan monastery in Santa Fe, Argentina, some eight years before his journal entry when the Paraná River burst its banks, a camalote delivered a jaguar the monastery garden, where entered the sacristy through a broken window and slew Brother Joseph Curami.

Father Miguel Magallanes managed to twice repel the beast, but was overcome the third time and died eight days later. An aspiring brother Joseph Pedraza was then attacked and died within a few hours.

Armed citizens entered the grounds and after removing a section of one of the roofs and shot the feline. While such stories are prone to magnify over time, this one has the authority of the handwritten account by Urbano de Iriondo, mayor of the municipality at the time.

In the convent today, to one side of the central nave is long "mesa del tigre" with a deep cleft, a blow given by the jaguar when he found himself trapped in that room. Padre Magallanes is buried nearby.



In "It Happened in Argentina," Science, June 1, 1934), Bernhard Dawson, attests to the table-top evidence.

I am glad to be able to communicate that such an event undoubtedly occurred in Argentina. I recently visited the Church of San Francisco, in Santa Fe, Argentina, as one of a numerous group, and the event in question was mentioned by a resident of Santa Fe, who accompanied us, as one of the items of interest about the church, which was built in 1680. Requesting exact information, I received a few days later a note from one of the Franciscan brothers, giving the date as the 18th of April, 1825. At that time the Parana River was in flood and the "tigre" entered the convent from a floating island of water hyacinths. One of the Franciscans was killed outright, the other was mortally wounded and died a week later. While the event as recorded by Darwin is thus fully substantiated, this does not exclude the possibility of a similar occurrence on the Rio Grande.

"Jaguar," Virginia Quarterly Review 73.2 (1997) by Richard O'Mara, provides a rendition more suited to the literary journal if its publication.

The Parana is a limitless universe, opaque and impenetrable even to the taciturn boatmen who fish it and traverse it from one end of their lives to the other. It goes everywhere. It forms islands and washes them away; it destroys with indifferent power all flora not native to the pampas that it can reach, and it can creep for miles across the near level steppe.

One year when this gargantuan process of evacuation was underway the cat was captured by the river. Possibly it had clambered out onto a tangle of vines, water plants and sticks after a rat or some amphibious rodent, when the whole mass broke loose and swirled away from the shore. This happens frequently at that time of year, and the proliferation of this detritus in the Parana is the first sign of the coming flood to people down river. The people call these floating islands of natural debris "camalotes." Often, in their course southward, they flower and ornament the spare beauty of the river. It would be a rare thing for an animal with the quickness and heft of a jaguar to be marooned on one.

No one knows where the cat had been taken out onto the water, but surely it must have been a long journey. For days the trapped animal clung to the drifting "camalote," growing hungrier by the hour; thirsting for the blood of cows within its very sight, the few pigs surviving on the reedy elevations, it dreamed of the spoor of armadillos, the buzzing of dragon flies over the land.

It was shortly before dawn when the camalote drifted from the main stream of the river into the inlet and nudged the beach below the Church of San Francisco. The first mass of the day was in progress. The priest blessed the host and bowed his head, his back to the congregation, mostly women in their shawls, the maids of the gentry who rise early to stoke the fires of the day. Suddenly the church was filled with fury. An unendurable cry tore the air anticipating an explosion of innocent slaughter. There are no written accounts left with much detail, only a brittle newspaper clipping or two. What is known is that the priest was the first to die.

DRAFT 3/30/2018

These days the river has no direct access to the Church of San Francisco. The entrance to the inlet has been cut off by a roadway. The inlet is a lake now with a boating and swimming club across from the church and a bright yellow beach where the Santafecinos come to escape summer's heat. The occasional tourist who arrives in the city will be directed to the church, for it is the oldest one in Santa Fe, built by the Franciscans, who came with the conquistadors. There they sell medals and holy cards and give away pamphlets describing the church's origin. The Indian people built it, Indian people who are as absent from the region today as the puma and the jaguar.

Paraguay

Four Years in Paraguay: Comprising an Account of that Republic (1838) William Robertson

When these are laid under water by the swelling of the Parana, it frequently happens that large portions of the islands get detached from their main body, and float down the river. The thick and strong interlacing of the roots of the vegetable matter thus detached, keeps the whole bed together; so that the camalotes (that is the name given to them) descend the stream for many leagues. Sometimes a tiger or lion, not unfrequently two or three, are on these camalotes when they break off from their parent island, and the animals in such cases seem always terror-stricken on their floating habitation. We saw one tiger thus situated, but at a considerable distance. Although we fired at him he did not move, afraid, seemingly, to leave the spot on which he stood fixed.

Montevideo

Reise in Brasilien (1831), an early scholarly report by Johann von Spix and Carl von Martius, makes mention of similar, if less macabre, transport, beginning with their Amazonian observation.

We saw some very singular assemblages of animals, pursuing peacefully their uncertain way in strange companionship. On one raft were several grave-looking storks, perched by the side of a party of monkeys, who made comical gestures, and burst into loud cries, on seeing the canoe. On another was seen a number of ducks and divers, sitting by a group of squirrels.

Next came down upon the stem of a large rotten cedar tree, an enormous crocodile, by the side of a tiger-cat, both animals regarding each other with hostility and mistrust, but the saurian being evidently most at his ease, as conscious of his superior strength!

The discussion then moves southward to Montevideo.

*Similar green rafts, principally composed of canes and brush wood, are called "camalotes" on the Parana in South America, and they are occasionally carried down by inundations, bearing on them the tiger, squirrel, and other quadrupeds. No less than **four** tigers were landed in this manner in one night at Monte Video, lat. 35 S., to the great alarm of the inhabitants, who found them prowling about the streets in the morning.*

Robertson (1838) provides another Montevideo account.

It is a historical fact, that many years ago, such a camalote as I now describe, carried three tigers with it down to the vicinity of Montevideo. They entered the town at daybreak. A pulpero, or vender of spirits, happened to have opened his door at this early hour, and to be engaged in some business behind his counter which kept him stooping down for some time. On rising up, one of the tigers which had entered, sprang upon him. I do not recollect if his, or any other life was lost, but several people were lacerated before the three tigers were destroyed.

Steam Warfare in the Parana: A Narrative of Operations (1848) by Charles Ollier offers yet another.

Sunday, May 25th. -- Early this morning all the convoy and men of war, except the English steamers, started down the river to the last rendezvous, five miles above the batteries of San Lorenzo. One French merchant brig was, however, detained by a curious circumstance

*happening in the night. A large floating island or camalote came athwart her hawse, and drove her down some distance before she could succeed in disengaging herself. About ten a.m. another camalote of very large size, apparently two acres in extent, floated into the midst of us. Two of the vessels were obliged to shift their helms hard over and veer cable quickly, otherwise they would no doubt have been sent adrift. These islands are sometimes very compact, and capable of sustaining a considerable weight. There is a well-authenticated story of **two** tigers being drifted down upon a camalote as far as Monte Video, where the beasts created great alarm.*

As all three reports recount not personal knowledge, but rather an undated passed-along tale, it is not unreasonable to suspect a common origin. The only real difference is that of the tiger count. Was it four? Three? Or just two? In any case, it outdid Santa Fe.

History being prone to remember the better story, it was four, according to The Fauna of Krakatau 1883-1933 (1948) by K.W. Dammennan, quoting from a H.H. Kew

On the Amazon River islands of this kind have often been recorded; whole trees with the soil about their roots, and upon them all sorts of animals -- birds, monkeys, squirrels and tiger-cats. Once no less than four pumas landed in this way at Montevideo one night to the great alarm of the inhabitants, who found them prowling about the streets in the morning.

Buenos Aires, 1858, pre 1870, 1880s

For a jaguar island to float to Montevideo, it would have to pass Buenos Aires, and surely some cats would debark at the opportunity. We've several reports.

"The Camalote, A Marvel of Tropical Vegetation," Merry's Museum, Parley's Magazine, Woodworth's Cabinet, and the Schoolfellow, July 1, 1858, describes that year's invasion of camalotes bringing with them snakes, pumas, and a pair of jaguars.

I wonder who knows what a camalote is, or who of our young friends ever saw a locomotive island, with its forests, its flowers, its fruits, its inhabitants, floating away for miles on the bosom of a river or a sea.

Such a sight was seen in April last, in South America, on the great river La Plata. There was an unusual freshet, such as had not been known for nearly twenty years. The Parana overflowed its banks for miles, and appeared more like a vast inland sea than a river. The effect of this freshet on the La Plata, at Buenos Ayres, was such as had never been witnessed before. Wharves and buildings were submerged, and whole streets overflowed. It was feared, for a time, that the entire city would be swallowed up by the river.

Early in the morning of the 8th of April, a rumor was circulated about the city that something was seen coming down from the Parana. The people crowded their miradores, and the playa of the river, and anxiously gazed upstream. Far away up in the north was seen a dense black mass, which slowly and steadily advanced like a fleet of war-boats. Everybody was alarmed. It was at the moment that a probable invasion by Urquiza was in everybody's mouth.

"If it should be Urquiza!" said the frightened people, "what is to be done?"

Justo José de Urquiza y García was a general instrumental in the unification of the Argentine nation.

The National Guard hurriedly repaired to their armories and donned their warlike apparel; the drums were beat to arms, and the artillery wheeled out into the Plaza... All who could crowded the beach, and gazed at the approaching flotilla. Slowly it approached, and towards noon it was near enough to allay the fears of the excited populace. It was an invasion, not of Urquiza's hordes, but of Camalotes, from the tropical regions of the Parana and Paraguay. As soon as this was generally known, the crowd increased, and all who could obtain boats embarked as fast as oars and sails could propel them, and advanced to meet the strange visitant. Hours

afterwards they returned, loaded with prizes from up the river. Flowers, fruits, wild beasts, all rewarded the enterprise of the hunters, who were well satisfied with their day's work.

Perhaps you do not know what a camalote is. It is a gigantic water-lily which grows in abundance on the tropical banks of the Upper Parana and Paraguay rivers. Its leaves are large, and of a bright rich green. The under sides of the leaves are divided into innumerable little compartments and divisions, as accurately marked as if laid out with mathematical precision the root is a hollow bulb of thin material, filled with air, and depending from which are long bunches of fine fibers, that cling to whatever comes in contact with them. The freshets loosen this camalote from its bed, and it floats down with the current in large masses, carrying with it everything that it may meet with on the surface. Sometimes these masses are half a mile in diameter, in ordinary times, and they generally lodge upon some island in the river, or upon some sand bank, which they soon convert into an island; so that very little camalote ever passes the mouth of the Parana Guaza into the Rio de la Plata.

This year the freshet is so heavy that the great mass of camalote was carried beyond the sand-bars and little islands above here, for they are all overflowed. It found a free course to the broad Plata, and I can assure you that its visit here is appreciated. The whole surface of our roads for miles is covered with camalote, and resembles a great meadow, gently moving with the tide. The green of this fine field is variegated with flowers of all the most brilliant hues and of the most exquisite fragrance. Wild orange trees and lemon trees in full flower and fruit; bushes of every size; palm trees of a dozen varieties, and trees of other kinds grow flourishingly on the waters of our harbor, side by side with ships, barks, and brigs. The spectacle is brilliantly beautiful. The tropical vegetation, which is spread out all over the river, is so enticing that it draws thousands to visit it every day.

But like all fictitious beauties, this charming prospect has its hidden dangers. Among the beautiful flowers lurk thousands of venomous reptiles from Paraguay. Little snakes of the most beautiful and variegated skins, and the most fatal bite, are constantly met with; the children, who have amused themselves hunting these treacherous "varmints," have several times been bitten, and one has died. The other day a number of young lions and jackals were discovered; foxes and prairie dogs, in any quantity, have landed here, and day before yesterday a superb pair of tigers made their appearance.

Palermo, so long the residence of "the tiger Kosas," has now its own royal beast from Paraguay roaming through its willow groves; the people there are frightened half out of their wits at the wild beasts. The foxes have eaten all their chickens; the jackals and lions have made sad havoc with the sheep; snakes and venomous reptiles of every kind, hitherto unknown in this peaceful province, overrun all the gardens and meadows. It is too bad in these hard times that the poor people must buy boots to protect their limbs and feet from their poisoned fangs. But, worse than all, now the tigers have landed, the timid country people are afraid to venture out of their ranches at night. General Homes, while waiting for Urquiza to come down, is to have a grand tiger hunt in Palermo in a few days, in which a thousand mounted soldiers will join. It will be sport worth seeing.

In a letter regarding published in Proceedings of the Zoological Society of London, February 10, 1870), ornithologist William Hudson notes,

I have known the Cierno, Jaguar, Aquara, and Carpincho, and other large mammals, also large Serpents and Alligators, to have been brought down and landed within a few miles of the city of Buenos Aires

Emile Daireaux's Voyage a La Plata: Trois Mois de Vacances (1888) mentions that jaguars sometimes come downstream on camalotes. Buenos Aires today has an outlying community "Tigre," named for its feline visitors.

The last station is the Tiger, situated on the bank of a Parana tributary. Its name comes from a jaguar that was killed there.



Exactly Where, We're Not Informed.

If we needn't know the port, our collection of jaguars-on-South-American-floating-islands can be further augmented.

"Has Tax Collectors Guessing: Old Hermit Who Lives on Floating Island Sails His Property from One State to the Other" was a humorous piece in the August 9, 1914 Washington Post, but within it was again a version of the jaguar story.

In South American rivers large trees are often entangled and float down, forming, in time, large islands, called "camalotes," and during a flood in the Parana the sight presented by them is remarkable.

The heavy rains cover the surface of the country with a sheet of water, often many feet deep, and all animal life is threatened. The floating islands become very populous abodes and are at times literally covered with wild creatures of every possible variety, and, of course, antagonistic.

Here will be found the puma side by side with a band of half-drowned monkeys, while near at hand will be a large snake, birds and smaller animals of all kinds -- all now at peace with one another when threatened with a common danger.

When such a load goes floating by a native village there is general rejoicing, and the floating island is soon depopulated

The claim of peaceful coexistence is of course ludicrous, but as a moral platitude, it passes the mark.

"Paraguay," The Weekly Hawk Eye (Burlington, Iowa), May 3, 1859, mentions floating islands on the Río Parana, "upon which are good large sized trees, reeds, and bushes," and which are "inhabited by snakes, tigers, and dangerous reptiles."

From Letters from the Battlefields of Paraguay (1870) by Richard Burton,

The "Camalote" or pistia stratiotes, called the Aguape further north, veils the water with fat, liliaceous leaves, supporting the flower stalks. Hence the "Camalotes," or floating islets, at times scattered over the river; there are legends of "tigers" and wild beasts being floated down by them into civilization. I never saw any that could compare with those of the Benin River.

In comparative respect, Burton is entirely correct, as jaguars are substantially smaller than their relatives in what's now Nigeria.

From Louis Agassiz: His Life and Work (1893) by Charles Holder,

It was while descending the Amazon that Agassiz first saw myriads of floating islands drifting down the river -- shrubs, trees, great palms, all bound together by entangled vines -- often half an acre in extent, sometimes bearing animals upon them. On many were cranes, herons, and other wading birds, and the captain of the steamer informed Agassiz that upon one occasion, when lying at anchor at Parana, he saw a floating island come down bearing two deer upon it, which he captured as the island struck the ship. At another time a large and powerful jaguar was seen floating along on one of these islands toward the sea. The lands overflowed were prolific places for the collector, the blades of grass and stalks often being covered with insects of all kinds and descriptions, which found safety here. As the steamer continued down the river, it took on more and more the appearance of a menagerie. Parrots, half a dozen monkeys, a pair of deer, several tame iguanas, a sloth, and numerous smaller animals making up the collection.

And from South America, Carpenter's Geographical Reader (1899) by Frank Carpenter

But some of the grassy islands are moving. That great mass of green over there is going past our steamer on its way down the river almost as fast as our engine is pushing us up the stream. See, the waves from the ship are making the island move up and down. It is a sheet of billowy green rising and falling with every wave. That is a floating island! There are many such in the Parana River. They are masses of weeds, flowers, and turf which the floods have torn from their foundations in the high lands and are carrying down to the sea. Some are so firm that they will support a man, and during the floods jaguars, snakes, and peccaries are carried upon them to the islands about Buenos Aires.

An engaging story invites retelling. Brazil (2000) by Errol Lincoln Uysl depicts five centuries of Brazilian history, not a surprising literary structure for a writer who assisted James Michener in his South African The Covenant (1980). Brazil begins in 1491 as three warriors travel terrain that will someday encompass the modern nation. One adventurer is slain -- Can we guess by what? -- by jaguars on a floating island.

The storm raged on, but the men and the boy were good swimmers and remained within sight of one another. While the wind and rain continued, they saw little chance of reaching the bank, but as they struggled to get beyond the grip of the current, they saw a floating island, a piece of jungle torn loose by the raging waters and held together by a massive web of roots deeply interwoven beneath its surface.

All three reached the island at the same time, shouting encouragement to one another as they grabbed for a hold among the slimy roots. Finally, they clawed up the side, and collapsed in exhausted silence. It was only then they noticed that the storm was passing, as swiftly as it had come. With the wind gone, the island remained in midstream, almost imperceptibly moving with the current.

They were able to see, in the last light, that the island appeared to be some forty paces at its broadest point and at least five times this distance in length. Beyond the tangle of its old wood on their right was a thick stand of cane. Where they'd climbed on, there were smaller shrubs, grasses, and patches of bamboo.

Pojucan said. After a pause, he added, "There is the village of the river people who welcomed us. We must go back."

"When we are off this land that moves, we will see," Ubiratan replied. It was a gloomy night, with a thin slice of moon, and they were grateful for the fire.

It was difficult to accept that this earth on which he stood was moving downstream. He glanced toward the riverbank and could make out the silhouette of the forest, but there was no sensation at all of motion.

Pojucan pressed on to find what lay ahead, where this great "earth canoe" parted the waters. Once or twice he thought he heard a low growl, but he dismissed it, for such a sound seemed impossible here.

He kept walking through the trees, twisting and turning to find the easiest route, making a mental note of where the good branches lay, stepping ever closer to the thick canebrake rooted to the front of the floating island-where the danger waited.

The jaguars rested between the canes... The female, though fully grown, was smaller than her partner. She twitched her tail rapidly and opened her massive jaws as if to growl but only began a fast, throaty panting. The thin canes brushing her quivered with the movement of her heaving sides.

Late that morning they had come to the edge of the main forest and, in search of food, swam side by side to the floating island. They remained in the canebrake there through the hottest part of the day, moving only when the sun began to slant away. They roamed the trees, prowling all over this tiny domain but finding nothing to appease their growing hunger. Then the violent storm had struck, driving them back toward the canebrake for shelter.

There was a natural clearing between the cluster of trees and the canebrake, with some low palms, saplings, and grasses, and Pojucan boldly walked into this opening, noisily snapping twigs underfoot and pushing branches out of his way. He saw no reason for caution, since he'd encountered no living things in this deserted place except insects.

With a deep, guttural roar, the jaguar burst out of the reeds and leapt toward Pojucan, his sharp claws extended. Pojucan fell back, caught in the embrace of the snarling beast, fighting hopelessly as the claws ripped through his flesh.

All the above stories, old and new, involve jaguars adrift on floating island lands, but the jaguar's aquatic prowess makes it unlikely that one would remain on board any longer than the confinement provided good hunting. In Jaguar Hunting in the Mato Grosso and Bolivia (1990), Tony de Almeida reports sighting a jaguar swimming across the Orinoco River where the river was 8 to 10 kilometers wide.

The Final Volley

The map earlier in this chapter illustrates the retreat of habitat over the past several centuries.

The animal's fat was esteemed throughout the America as a remedy for ills, and especially for rheumatism. Alexander von Humboldt stated in his Personal Narrative of Travels to the Equinoctial Regions of America, During the Years 1799-1804 (1852) that 2,000 skins were exported annually from Buenos Ayres..

Late-19th and early 20th-century references still noted the presence of jaguars from Buenos Aires to the banks of the Colorado and jaguars still dwelt in the north of Corrientes Province into the early 1900s, but the population was falling below that required for sustainability.

Montecarlo, Misiones, 1924.



The jaguar has been absent from the northeastern Paraguayan since the 1930s.

"American Explorer Tells Vivid Experiences in Paraguay Jungle," Fayetteville Daily Democrat, June 1, 1932, touts the exploits of American explorer Donald Wees' three-month sojourn.

He brought back motion pictures of a jaguar of the ferocious type South Americans call "tigre." He shot the animal as it jumped on a floating island of moss which, he said, made an excellent "set" for his movie.

Wees' movie doesn't seem to have been released, however.

Wees had more news than banging a leaping cat, in fact, per "White Indians Found" in the Brewster Herald of March 29, 1932,

A Harvard museum explorer has confirmed .the long reported existence of white Indians in South America. Returning from an expedition during which he penetrated the alternate arid and jungle country of northeastern Paraguay, Dr. Donald S. Woes, of that institution, reported the finding of white Indians with blond hair living in both the jungle and Grand desert like wild animals.

He says they do not have clothes, shelters or traps of any kind. The bow and arrow is their chief weapon. They was so shy and wild he couldn't even get a picture of them

Harvard was quick to distance itself. From the Fitchburg Sentinel, May 23, 1932.

Harvard university authorities today discounted stones of white Indians in Paraguay, given out by Donald S Wees in Buenos Aires, describing Wees as an "obviously inexperienced amateur" and saying that Wees had revived a "hoax " The statement, issued by Museum of Comparative Zoology, said that institution strongly disapproved the publicity obtained by Wees, that he was a private collector who had offered to collect specimens for Harvard... His reviving of the "white Indian hoax" was described as "more than flesh can bear" by the museum authorities,

The Harvard Crimson of May 24, had its fun with the story, adding,

The speech of the Indians resembles that of no known tongue, according to press reports, and the only way to approach them is to shoot them.

The Museum of Comparative Zoology did, however, accept 66 animal skins from the great White hunter, one of them possibly being that of the region's final floating-island jaguar.

In El Hacedor (1960), Jorge Luis Borges retrieves a tiger from boyhood days.

In my childhood I was a fervent worshiper of the tiger: not the jaguar, the spotted "tiger" of the Amazonian tangles and the isles of vegetation that float down the Paraná, but that striped, Asiatic, royal tiger, that can only be faced by a man of war, on a castle atop an elephant. I used to linger endlessly before one of the cages at the zoo; I judged vast encyclopedias and books of natural history by the splendor of their tigers. (I still remember those illustrations: I who cannot rightly recall the brow or the smile of a woman.)

Childhood passed away, and the tigers and my passion for them grew old, but still they are in my dreams. At that submerged or chaotic level they keep prevailing. And so, as I sleep, some dream beguiles me, and suddenly I know I am dreaming. Then I think: this is a dream, a pure diversion of my will; and now that I have unlimited power, I am going to cause a tiger.

As a boy, of course, Borges chose the grandest of the tigers, the Bengal. As the author was to later write for 26 years, totally blind, we can wonder if his dream came more and more to swim among the camalotes floating by his native Buenos Aires.

More recently, Douglas Tompkins, founder of The North Face and Esprit clothing labels, purchased more than half a million acres of the Esteros with the intent of reintroducing such lost species as the jaguar and transforming the property a national park.

CHAPTER 43

VISIT OLD MACDONALD'S FARM

Most residents of Old MacDonald's barnyard have been reported on floating islands.

Horses

Virgilio Spada's Discorso di V Sp sopra i Disordini della Facciata della Chiesa e Portico di S. Pietro, che al Presente se Vedono (1645) mentions two floating wooded islands of near Ferrana so large and buoyant that one can easily hunt animals upon them on horseback.

From Charles Darwin's report of the floating islets in Lake Tagua-Tagua. Chile (Chapter 45),

As the wind blows they pass from one side of the lake to the other, and often carry cattle and horses as passengers.



As recorded by Francesco Lana de Terzi in Magisterium Naturae (1684-92),

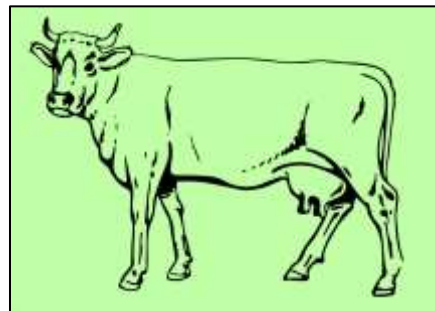
The lake near Stockholm, at 60° N, which is two miles long and about a musket-shot wide, seems to be gradually filling with earth, so that twenty years from now men will be able to walk up to a quarter mile over it, but in fact it is only a cover, beneath which lies the lake, its waters full of fish. This mat is about four inches thick, and it trembles beneath one's feet; its surface is grassy. If a part of the mat is broken off, it floats in the water, pushed here and there by the wind, and the lake is always being filled more and more with this material...

Lann adds that this floating land, which in some places supports a horse standing upon it, in others a man, in others a dog, and in others hardly a duck; while other floating islands, as we saw above, support whole flocks and woods.

As to the modern identity of this floating island, we cannot be sure. If "near Stockholm" simply means, "in Sweden," there are numerous candidates, Ralangen (Chapter 48), perhaps the most notable.

Cattle

As we note elsewhere, the cow-carried-away-on-floating-island is a common story



From Lake Arary, Brazil, 1879,



Johann Kohl's Die Marschen und Inseln der Herzogthümer Schleswig und Holstein (1846), on floating islands near Bremen, Germany in 1756,

The floods have lifted whole bog pieces and transported with the houses and herds of cattle situated thereon to one point in particular.

Beschreibung des Schwedischen Krieges 1630-1647 (1875) by Sebastian Burster, on the Austrian Hautsee,

Willow, hazel and other woods, woven by themselves together so strong and firm that some pieces can support cattle.

Gerdaunen, once a part of Prussia, is now the town of Zheleznodorozhnyy in Kaliningrad, Russia, just above the Polish border. Christian Rast, Dissertatio Historico-Physica, de Insula Natante Gerdaviensi, vulga Schwimmbruch (1707) on the region's floating island.

The floating island, 1750 by 1250 feet, was capable, according to Rast's sources, of pasturing 100 cattle.

The island consisted of reeds, rushes and roots intertwined with twigs and covered with rich earth; and it was moved by the wind.



Rast attributes the island's creation to the damming of the river that flowed around Gerdaunen a century before the time of his writing; at some uncertain point it had broken into three smaller parcels.

Caspar Stein, in Prussica Memoabilia (1730), adds,

The Lake of Gerdaviensis and in it, the so called Isle of Werdt, swimming from here to there, sometimes in the middle, sometimes on the banks or not far from the banks, in which cows pasture, to which the milk maiden go by boat.

A System of Geography, Ancient and Modern (1808-14) by James Playfair provides a signal that all wasn't going well for the island a century later.

Gerdauden, a little town with two seats on the Omet built in 1325, about five leagues east of the River Alla, and nine east, northeast of Bartenstein, near the border of a lake containing a floating island which is gradually decreasing.

Rast's 100 head of grazing cattle remained cited as a contemporary condition for some decades more, however, Physical Geography (1828) by H.J. Lloyd,, Penny Magazine of the Society for the Diffusion of Useful Knowledge, July 20, 1843, The Gallery of Nature: a Tour through Creation (1860) by Thomas Milner, and Chambers's Encyclopedia,(1874) being examples.

From Principles of Mathematical, Physical and Political Geography (1834), by Malthe Conrad-Brun

The most considerable [floating islands] that are mentioned, are those of the lake of Gerdau, in Prussia, which furnish pasturage for 100 head of cattle; and that of the lake of Kolk, in the county of Osnabruck, which is covered with beautiful elms.

But herd of 100 pale before cattle counted in the thousands. Agronomist Filippo Re's Annals of Agriculture of the Kingdom of Italy (1813) notes large biogenic floating islands of peat that would rise with the water level during floods in the Po and Adige basins. The islands were so large -- anecdotal evidence suggests perhaps 1 to 2 square kilometers -- that they contained farms, mills and cultivated fields capable of supporting thousands of cows and oxen.

On the Beauties, Harmonies, and Sublimities of Nature: With Occasional Remarks on the Laws, Customs, Manners, and Opinions of Various Nations (1823) by Charles Bucke,

Near St. Omer, floating islands are found. The last move at the will of the neighboring farmers who draw them near the shore to drive their cattle upon, and having done so, they unloose the chords and let them float at the discretion of the winds.

William White notes floating islands in abandoned peat workings in History, Gazetteer and Directory of Norfolk (1864).

These islands become massed and compacted together, and in time form marshy ground, leaving only a channel for the flow of water to pass through. In some places where boats could sail fifty years ago, people may now walk and, where there were swamps and treacherous ground, heavy cattle are now grazing.

Lorenzo Stephen, in Life Sketches of a Jayhawker of '49 (1916), records seeing a floating island with 60 cattle on it on the San Joaquin River, California in 1862.

I wanted to go to Stockton so I had to take the boat to Benecia and then take the Stockton boat up from there. I saw quite a queer sight going up the river. We passed a floating island with about sixty head of cattle on it, the peat or tulle had let loose and floated to the surface of the water and they had to ship hay to the cattle on boats to keep them alive.

"Tule and Tule Lands," Daily Alta California, January 3, 1871, discusses cattle pasturage, and perhaps more import, cattle refuge in times of flood, along the Sacramento River.

There is, however, a little floating island in the midst of most of the tule islands. The center of the tule island is from two and a half to three feet lower than the bank, so that at high, or even half tide, it is covered with water, which communicates with the surrounding water by a slough. Drift-wood and dried stems of tule are carried by the tide through the slough to the little island-lake, where they gradually get interlaced into a mass too large to pass out through the slough. The mass increases with new additions of tule and sticks, and then grass grows, and, with its roots, makes a sod which becomes about three and a half feet deep and strong enough to bear cattle and even loaded wagons. This floating island is attached to the land under it by roots, but rises and falls with the tide.

The pasture is good --the best in the tule districts. These little patches of float, which never exceed a few hundred acres in size, are good places for cattle in times of flood. They saved many herds during the high water of 1862. Cattle have no difficulty in getting upon the floating island at almost any point at low tide when it rests on the soil beneath it. The tules surround the float, but never grow on it.

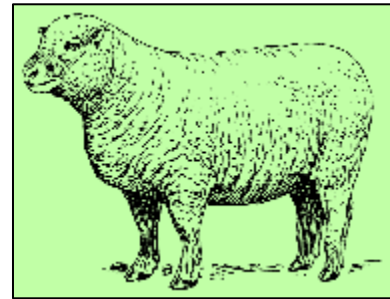
The grass on these floats makes good hay, and on one occasion a farmer near the San Joaquin River put too much of a load upon the wagon at high tide, and he had the mortification of seeing his vehicle suddenly disappear, having broken through the sod and passed down to a firmer bottom.

"Floating Island on African Lake," Rome Daily Sentinel, May 12, 1949,

Regarded as one of the wonders of South Africa is a 1,200-acre floating island in a lake near Harrisburg. It contains a growth of grass so luxuriant and so completely independent of the weather that during a severe drought some years ago 1,700 head of cattle grazed on it.

Sheep

In "Un Islote Flotante," Boletin de la Escuela Normal de Varones 3.28 (August, 1923), Damaso Fajardo reports a Honduran lake 500 meters in circumference containing floating island with pine trees. Sheep wander onto the island when it touches shore and sometimes drown when they jump off.'

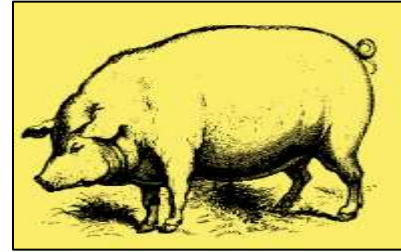


Legend says that the floating island of *Carex* sp. and *Menyanthes trifoliata* of Visitorsko Jezero, Montenegro, was used by ancient shepherds to transport stock.



Pigs

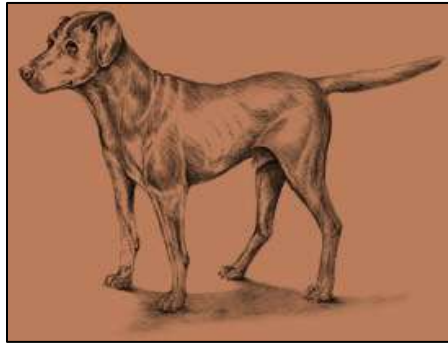
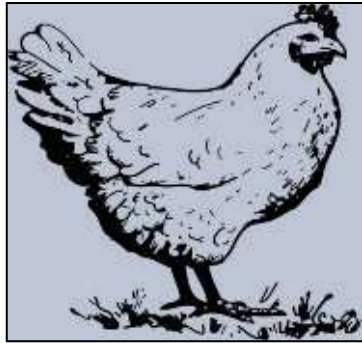
An "Annales Floresiensis" entry for 1287 in Monumenta Germaniae Historica Inde ab Anno Christi Quingentesimo Usque ad Annum Millesimum et Quingentesimum, Scriptorum 16 mentions a flood that tore loose a field near Floreffe, Belgium and floated it two miles, together with a pig that was grazing on it.



"Nearly a Cause Celebre." Sacramento Daily Union, June 3, 1871, Gippsland

The only occupants of this remarkable apparition were a few pigs, feeding away contentedly and apparently enjoying their novel journey by water. A second island of the same description, but much smaller, was noticed a little farther on, but this had evidently detached itself from the larger piece of land, or most probably had been separated by the rooting depredations of the porkers.

Chickens and Doga



Song Dynasty poet Lu You wrote in his Ru shu ji that when he entered into what's now Sichuang Province,

We came across a large raft more than 10 zhang wide and more than 50 zhang long [more than 33 by 165 meters], on which there were thirty or forty households with wives, children, chickens, dogs, mortars and pestles. There were footpaths crisscrossing between the fields and even a temple, never seen before. The boater said that this raft was a small one. A larger raft would be covered with soil as a vegetable garden, or might have a wine shop built upon it. However, it would not be able to enter the Three Gorges, but would float on the Yangtze River.

Cats

The larger floating islands of Lake Titicaca (Chapter 36) house about ten families. Some of the islands have electricity and telephone service. Cats keep the islands rat free.



Rabbits

According to "Rafting of Jack Rabbit on Kelp," Journal of Mammalogy 40.3 (1959), by John Prescott, a black-tailed rabbit traveled some 39 miles from the California coast on a 40 by 25 foot raft of kelp. It's more credible than the squirrel story.

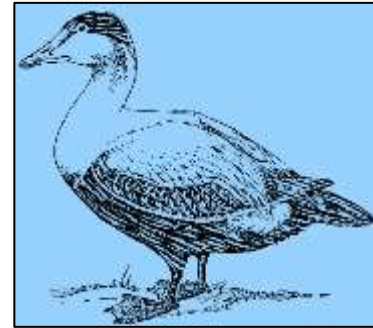


A German rabbit is a "Kaninchen." From "A Floating Island," Brooklyn Standard Union, December 6, 1903,

Passengers on what is called the national route from Glascowow to Goldberg, on the German coast, witnessed a strange spectacle which recalled a well-known novel by Jules Verne, A piece of land of about 10,000 square yards became detached from the coast and began to sail out to sea. A curious feature of the spectacle was the position of some twenty large alder trees. Some were bending, while others were almost lying on the ground. Hares and rabbits ran hither and thither, anxious to escape contact with the waves.

Ducks

Sir Peter Viggers was forced to stand down from Parliament in 2009 after Prime Minister Cameron criticized Viggers' £1,645 claim for a 32-square-foot floating duck house as an MP expense. Viggers later sold the dwelling for £1,700 to Hilton Hall, a 14th-century manor house-turned business center.



The cartoonists loved it.



Make the most of this. Our man is being forced to stand down at the next election.
Stan McMurtey,
Daily Mail, May 22, 2009



They're calling it "Lame Duck" Island.
Scott Clissold,
Sunday Express, May 24, 2009



We'll have to downsize to a Duck Flat.
Nicholas Newman,
Times, September 13, 2009



The Wreck of the Duck House
Nicholas Garland,
Daily Telegraph, October 13, 2009

Chapter 43 -- Visit Old MacDonald's Farm



Back off, or this duck gets it!
Peter Brookes,
Times, October 13, 2009



It may be legal, but it's morally wrong.
Christian Adams,
Daily Telegraph, June 22, 2012



Christian Adams,
Daily Telegraph, June 3, 2013



Christian Adams,
Daily Telegraph, July 2, 2013

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CHAPTER 44

SIDESTEP THE SNAKES

There may be a variety.

Coral and Atolls (1910) by F. Wood-Jones records a tree washed ashore at Cocos-Keeling, Australia with a small snake burrowed within the wheelbarrow load of soil in its buttressed base. . Such masses of debris are commonly washed out to sea from islands west of Fiji.

The January 13, 1871 entry in William H. Seward's Travels Around the World (1873) mentions a floating island off the coast of Sumatra which bore a boa constrictor.

Sumatra presents a low, sedgy shore, large pieces of which, covered with jungle, are continually breaking loose, and float about in the forms of pretty green islets on the dark sea. Of course, .every one desires to haul up to them and see what are the plants and flowers which cover them. A Dutch skipper yielded to this impulse a short time ago. The captain, alighting on the floating mass, had just set his foot on a cactus-stump, when a huge boa-constrictor reared his glossy head and proclaimed his proprietor- ship of the island by violent hisses. The invader retreated, leaving the "lord of the isle" to navigate his crazy craft as best he might.



Another boa report, this one in Island Life (1892) by Alfred Wallace.

A large boa constrictor ... once floated to the island of St Vincent, twisted round the trunk of a cedar tree, and was so little injured on its voyage that it captured some sheep before it was killed, having crossed more than 320 km from Trinidad or the mainland coast of South America.

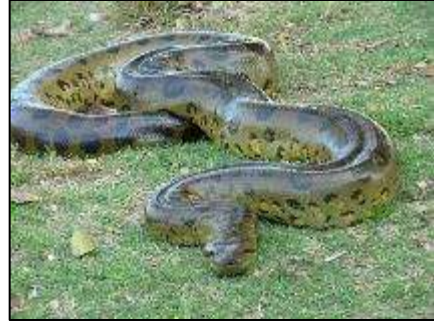
And another, this one from James Rodway's In the Guiana Forest: Studies of Nature in Relation to the Struggle for Life (1912). Floating islands, some 50 feet in diameter, carry *Boa murina*, the heaviest extant snake species.

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Chapter 44 -- Sidestep the Snakes

From Richard Spruce's Notes of a Botanist on the Amazon & Andes (1908)

In 1836, the year following the rebellion of the Cabanos, five sloops of war were sent from Pari to receive the submission of the various towns on the river, and whilst lying at anchor in the port of Santarem, a grass-island of some acres in extent found its way into the Tapajoz, and coming full upon those vessels, tore them all from their anchorage and carried them bodily down the river. A strong body of soldiers, blacks and Indians, amounting to some hundreds, were dispatched to liberate them and it cost many hours' labor with axes and tercados to effect it, for the island was several yards in thickness. Numbers of snakes (Anacondas), and even some cow-fishes (called Peixe-boys), were found in it and killed.



We'll hear more from Captain Pendlebury in Chapter 50, but an excerpt from "A Floating Island Followed His Ship," New York Times, May 23, 1924, describes his observation between Borneo and the Malay Peninsula.

Captain Pendlebury... said its palm trees were higher than the wireless masts of his ship and in their tops were chattering monkeys and singing birds. Through marine glasses the skipper said he saw great masses of flowering vegetation and a large number of cobras, deadly reptiles.



"Monkeys Bomb Ship with Cocoanuts; Snakes Mad," Carbondale Daily Free Press, June 3, 1924, tells of the same incident.

Captain Pendlebury put on steam and got his vessel safely away. He said there also were some giant snakes which swung out from the islands and endeavored to wrap themselves around the ship, but these reptiles were more easily avoided.

We've no illustration, but it might resemble the fearsome attack of the kraken in Chapter 8.

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Chapter 44 -- Sidestep the Snakes

From "Oceanic and Climatic Phenomena along the West Coast of South America during 1925," Geographical Review 16 (1926) by R.C. Murphy,

*Off the Peruvian coast during an El Nino year 'belts of murky, yellow-green water in which floated quantities of logs, with the harbor at Talara choked with ... flotsam in which the bodies of birds, fishes and other creatures were mingled with vegetation. Live reptiles had also floated ashore on rafts including a lizard *Dicrodon lentiginosus* and a fer-de-lance snake *Bothrops asper* which must have drifted at least 250 km from the north.*



"A Possible Manner of Snake Distribution," Copeia 142, 1925, by W.J. Clench, reports a floating island of water hyacinth that reached Sanibel Island, Florida, from the Caloosahatchee River, bearing a rattlesnake.



"Saved By Floating Island: Fishing Party, Upset in Florida Lake, Fights Snake with Oar," New York Times, April 12, 1937

Two men told last night a story of being shipwrecked on a lake for fourteen hours, and at one time crowding a water moccasin off their floating island perch. Fred Dailey, president of the Wheaton, Ill., Chamber of Commerce, and Ralph Greene of Chicago said that they were on a fishing trip on Orange Lake Thursday afternoon in a rowboat along with Sergeant Allen Hills, stationed at Champaign, and a guide.



A squall came up and overturned the boat. All three white men could swim, but the Negro guide could not. He hung onto the boat while the other three men pushed it to the island. They stayed in the water about two and a half hours before they reached the floating island where they passed the night, they said.

A water moccasin tried to reach their haven of safety, but was knocked back in the water with the only oar they had. On Friday morning they used the broken oar to paddle to safety.

From "Buenos Aires and its River of Silver," National Geographic 40, July-December 1921, by William Barbour,

Floating Islands Harbor Hordes of Snakes

These camalotes make their appearance in times of high water, being carried out into the current from the adjacent swamps. They always harbor many snakes. In 1905 a great flood brought so many of these "islands" down the river that they stranded on the banks near Buenos Aires and thus constituted a public menace. Thousands of snakes, with an occasional wild boar or other animal which had become marooned, went ashore into the thickets between Palermo

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Park and the river, and a large force of policemen armed with machetes had to be put to work killing them.

Federico Achaval, Julio Gonzales, Melitta Meneghel and Anibal Melgarejo, "Lista Comentada del Material Recogido en Costas Uruguayas, Transportado por Camalotes desde el Rio Parana," Acta Zoologica Lilloana 35 (1979) describe floating islands that washed up in Montevideo in early 1977. The ombue is a massive evergreen tree with an umbrella-like canopy.

Several dead snakes, among which there was a pit viper, 1230 mm in length,

A water cobra and South American water snake, additionally, fresh and decomposed apples, onions, and even two "ombues," a whole one about 8 meters tall from the roots and the other trunk and roots measuring about 3.50 m. long.



Referring floods of the Parana and Uruguay rivers of 1905,

The species of snakes collected, seemed to come from Paraguay.

At that time "camalotes" arrived in Montevideo, clogging the bay and much of the coast. At Pocitos Beach, a large trunk was found that remained there for several years. Among the wildlife that can be seen, a dead deer, various rodents, especially snakes, one of which killed a person in the vicinity of Cerro.

But then again, maybe the snakes are absent. A bit of background from Francisco Lopez de Gomora, Historia General de las Indias (1516), published 14 years after Christopher Columbus landed in what's now Nicaragua,

Near Trujillo and San Pedro there is a lagoon where the wind, moving from one place to another, moves trees with their land, or better said, islets with trees,

Bernhardus Varenius, Geographia Generalis (1650),

In the South American province of Honduras there is a lake in which many hills with grass and shrubs are seen to be moved here and there by the wind.

Universal Geography, or a Description of All Parts of the World (1827), Conrad Malte-Brun, its 300-year-old citation, reflecting the scant re-exploration of the inhospitable Mosquito Coast,

The province of Honduras is very little known...The most western part of this province contains the little Spanish towns of Comayagua and of Truxillo. The latter of these has been built near a lake, where floating islands covered with large trees move from place to place at the discretion of the wind.

More up to date, "Gamalote, the Floating Island," synopsis from Rewired and Retired in Nicaragua blog, August 22, 2011. "Gamalote" is a Central American synonym for "camalote," Chapter 28.

El Gamalote, a floating island on Lake Cocibolca. These floating islands are usually smaller than a basketball court. This morning's Gamalote is about the size of two football fields.

Chapter 44 -- Sidestep the Snakes

Grasses and rushes grow along the edges of the rivers. These rushes and grasses gradually push their way out into deeper waters, leaving a shelf and a mass of decaying vegetable matter on which other mosses and plants gain a foothold. When well established, other water-loving plants, such as water lilies and shrubs grow along with the moss and grasses. Still attached to the banks of the river, a layer of peat forms a foundation, usually less than three feet thick. The mat becomes firm and eventually small trees will grow on the Gamalote, weaving their roots into the peat and strengthening the foundation.



Then, when the rains come, the water level rises, and the mini-ecosystem breaks off forming a floating island. The local islanders are afraid of these floating islands because the mini-ecosystem lodges itself on Ometepe Island, like a shipwreck. New animals and serpents exit the floating island like stranded survivors seeking refuge on dry land.

He didn't see any snakes, but he reported a variety of sea birds, turtles, water lilies, and shrubs.

By evening, the floating island was within 20 feet of our beach. Like at a horse race, the crowd cheered when the Gamalote floated further out in the lake, and booed when it floated closer to the shore.

This morning, it is slowly headed farther south toward Punta Jesus Maria.

Chapter 28 mentions the dangerous snakes found on the camalotes of the Rio Parana, and other chapters note similar inhabitants elsewhere. Avoid such floating islands.

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CHAPTER 45

BE WARY OF OTHER CREATURES

Some terrestrial species are thought to have crossed ocean barriers as passengers on floating objects, perhaps a wave-washed tree trunk for a burrowed insect, perhaps a buoyant portion of terrain for a larger mammal or amphibian.

Three theories of bio-dispersal

1. Floating island model -- Organisms are passively transported in an island across wide water bodies. These islands are typically formed by pieces of land and plants detached from the margins of large rivers.
2. Island hopping model -- Organisms migrate across large water bodies through sets of islands (also called "stepping-stones"). All islands do not necessarily persist during the entire migration, but adjacent islands are successively connected along geological time.
3. Land bridge model -- Two land masses connected in the past, but not anymore, a model used to explain disjunct geographical patterns between continents before continental drift became accepted. We quote two references -- one scientific, the other fictional -- to Madagascar as such a "floating island,"

"Drifting Isle Leaves Tracks," Popular Mechanics, November 1983,

Millions of years ago, it's thought, several continents were joined to form large landmass called Gondwanaland. The mass broke up and the parts went their separate ways. How these pieces originally fit together has been a mystery.

Some scientists now believe that one of the pieces, the island of Madagascar, off the coast of Mozambique, was once attached to Africa near where Kenya is today. The evidence? A magnetic code inscribed in the seafloor.

By tracing the path of the reversals between Africa and Madagascar, a team of geologists... was able to figure that the island drifted 1,000 miles south over millions of years to its present location. It's also been argued that Madagascar moved northeast from the African coast. Another theory is that everything shifted around Madagascar and it did not move at all.

Secret of Platform 13 (1998) by Eva Ibbotson,

The people who lived on it just called it the Island, but it has had all sorts of names: Avalon, St. Martin's Land, the Place of the Sudden Mists. Years and years ago it was joined to the mainland, but then it broke off and floated away slowly westwards, just as Madagascar floated away from the continent of Africa. Islands do that every few million years or so; it is nothing to make a fuss about.

Should the involuntary passengers beach on a suitable shore, the ecology of their new homeland may alter to accommodate the imposition. As real-time observers, we'd be prone to cry, "Invasive species!" but if we arrive some centuries later, we may interpret the diversity, or lack thereof, to be nature's order.

Let us remind ourselves that we're dealing with island passengers. If the island itself is faunal of any sort, we shouldn't be aboard. See Chapters 6-8.

We, of course, aren't the first to pay notice to the fauna, and the potential ecological implications thereof.

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From Principles of Geology, or The Modern Changes of the Earth and Its Inhabitants (1830) by Charles Lyell,

Captain W.H. Smyth informs me, that when cruising in the Cornwallis amidst the Philippine Islands, he has more than once seen, after those dreadful hurricanes called typhoons, floating islands of wood, with trees growing upon them, and that ships have sometimes £ in imminent peril, in consequence of mistaking them for terra firma.

It is highly interesting to trace, in imagination, the effects of the passage of these rafts from the mouth of a large river to some archipelago, such as those in the South Pacific, raised from the deep, in comparatively modern times, by the operations of the volcano and the earthquake, and the joint labors of coral-animals and testacea. If a storm arise, and the frail vessel be wrecked, still many a bird and insect may succeed in gaining, by flight, some island of the newly-formed group, while the seeds and berries of herbs and shrubs, which fall into the waves, may be thrown upon the strand. But if the surface of the deep be calm, and the rafts are carried along by a current, or wafted by some slight breath of air fanning the foliage of the green trees, it may arrive, after a passage of several weeks, at the bay of an island, into which its plants and animals may be poured out as from an ark, and thus a colony of several hundred new species may at once be naturalized.

As likewise noted by Stephen Visher in Tropical Cyclones of the Pacific (1925),

The floods caused by the excessive rainfall associated with hurricanes influence the dispersal of land forms. There are numerous records of the fall of more than twenty inches in two days, and some records of more than sixty inches in three days. Under such conditions streams normally small may become great rivers and carry to sea vast quantities of driftwood. The river banks are eroded badly, and many trees are undercut and are carried out to sea. During the excessive rains, large masses of dirt and loose rock upon steep hillsides may slip, sometimes damming valleys. If the dam breaks, the sudden rush of water does its part to contribute natural rafts of driftwood with their load of land animals and seeds.

In Insects of Hawaii (1948), Elwood Zimmerman reflects on floating islands seen from a ship between the Celebes and Borneo.

While out of sight of land on a voyage between Macassar, Celebes and Sandakan, Borneo, many "floating islands" were seen. These mats of vegetation were lush and green, and palm trees 20 to 30 feet high stood erect on the floating masses. A survey of these rafts probably would reveal that numerous plants and animals were riding them.

Although such rafts are probably broken up by rough water, it is possible that some of them, on rare occasions, could travel more or less intact for many hundreds of miles and deposit at least part of their living cargoes on foreign shores. I have seen large trees washed from stream sides during a storm in Tahiti and have seen them floating out to sea with their large branches riding high out of the water. The large, heavy trunks, great root masses in which are entangled stones and soil, and the submerged limbs may act as keel, ballast and stabilizers and hold a part of such floating trees permanently out of the water. Some of the branches may be held 20 or more feet above the waves.

At rare intervals, colonies of animals and seeds may be able to survive lengthy journeys in such perches. It is conceivable that over a period of several millions of years a few such floating trees have been beached in Hawaii and that from them there escaped ancestors of some of our insects, terrestrial mollusks and plants.

Paleontologist William Diller "Climate and Evolution," Annals of the New York Academy of Sciences 24:1, February 1915, hypothesizes some numbers.

That mammals had invaded the southern continents repeatedly from centers in the north, driven by alternating periods of harsh and warm climates, was founded on the premise of the

permanence of the pattern of land and water as now existing. the presence on islands of species that could not swim or fly was not evidence of former land connections.

It was known that floating clumps of vegetation, tom out by floods and carried down to sea by great rivers, are sometimes formed and have occasionally been seen far out at sea.

Assume just one in a hundred such rafts to carry living mammals, assume a one-in-ten likelihood of landfall, assume probability of a passenger surviving the trip as one in three, landing at a favorable environment one in ten, chance of the passenger being a gravid female one in five, and allow about three rafts a year, then in the thirty million years of the Cenozoic era, three hundred species may have thus obtained a foothold.

One could quibble with the math, as by Diller's assumed odds, $30,000,000 * 3/5/10/3/10/100$ leads to 600 transports, not 300. This, however, would be the probable count of gravid females, not differing species, as Diller seems to suggest. But the number is not central to the proposition that the odds support to some degree the inter-island transport of non-swimming or non-flying fauna on floating debris.

That's the big picture, what biologists pursue as they ponder the nature of the world.

We'll be a bit more pragmatic. As we tramp (or bob, see Chapter 48) over a floating island, what creatures should be wary of stepping upon?

Alligators

We've dealt with alligators disguised as islands in Chapter 8, but more likely to be encountered is an alligator who feels he or she holds title to the real estate.



To the right, an eight-foot Caiman alligator on a floating island in Los Esteros del Iberá, Argentina.

"Vegetation, Vellum Clutter Valrico Lake," St. Petersburg Times, October 30, 1995, reports that snakes and alligators living on the floating islands of Lake Valrico, cause problems for residents when the islands deposit these animals near their homes.

Using 90-foot boats with large blades, Texas Aquatic Harvesting carves up islands that average the size of Yankee Stadium. "Cookie cutter" boats act like Cuisinarts on an island, turning it into puree (Chapter 82). In Lake Jackson, reports an operator, "those islands were full of marsh rats and rabbits." When the cookie cutter got going, "the alligators were in a feeding frenzy. They would have three or four rats and rabbits in their mouths at one time."

Capybaras

"Floristic Composition and Structure of Floodplain Vegetation in the Northern Pantanal of Mato Grosso, Brazil," *Phyton (Horn, Austria)* 39.2 (1999), by Michael Schessl, mentions floating meadows carrying Cecropia trees and supporting the weight of capybara (the world's largest rodent) and alligators.



To the right, capabara in Los Esteros del Iberá.

"El Carpincho y la Raya," *Camperas* (1980) by Leonardo Castellani, a fable set on a floating island in the Parana.

The River-like the-the-Sea has no whales, but has camalotes. No other river in the world has them, and for that the Paraná is proud.

How smug it became when by means of a freak camalote whose spine was a trunk of guayacán fifteen meters long, it split in two the wood and iron beams with which the city of Santa Fe pretended to shackle the "flowing water"!

There is also the floating island that bore a friar-eating tiger to the city center, where it slew two Franciscan friars in the Garay convent courtyard on the banks of the river

But the camalote of this fable was more modest, little more than two dozen frogs and toads, some snakes, dirt and trash, and an old capybara ripped from the ground some stormy night, along with a kapok tree and an entire piece of bank from which he was now waiting for things to calm dawn before taking the plunge and swimming to shore.

He slept peacefully on the straw, rocked by the rugged waves. Strange moans or yelps awoke him the next morning. Perched on the trunk, he looked at the splashing water and saw two eyes so fierce that he thought it to be the devil. Two big eyes like a man, but green, fixed and wicked.

It quickly became a swirl like a water flower and then appeared the round and gelatinous body of a ray the size wheel of a car.

At 100 pounds, a modest-sized Argentinian river ray, if not a floating island passenger, a floating island menace.



Marsh Deer

The largest deer in South America can be found living on the floating islands in Ibera.



Boar

Theophrastus, Enquiry into Plants (c. 300 BC), Greece

The floating islands of Orchomenos are of various sizes, the largest being about three furlongs in circumference. But in Egypt very large ones form, so that even a number of boars are found in them, and men go across to the islands to hunt them.

Hubert Gervol's En Indo-Chine (1880s) tells of hunting babirusa, the hog-like Babyrussa, on floating islands in Burma's Irrawady River in flood. They kill one and also a large snake.



Coypu

Cartas a Elvira (2012) by Daniel Martínez Rubio

We traveled from Montevideo to Buenos Aires. Navigation is slow, large camalotes float around us, sometimes grouped together and seemingly adrift, detached from their anchor. Birds and other animals populate the camalotes. A group of grebes resting on a camalote. Among movement of branches and leaves, we see a whiskered head scan the horizon of water. "Otter," exclaims Puccini. "It's a coypu, teacher, like a beaver."



Marmots and Meercats

"Deadly Seaweed Sea," Idaho Daily Statesman, August 9, 1898, reports an island floating in the Sargasso Sea with both snakes and marmots, which are different than meerkats.

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Verdure, vines and trees covered the island. Countless birds of bright plumage, native of climes remote from their island home, fluttered in and out. Marmots chattered and scrambled about in the boughs. Snakes crawled about in the trees or lay basking on logs which floated in the same listless manner.



Foxes and Raccoons

"Fun on a Floating Island," Rockland County Journal, October 17, 1896,

After a year's anchorage on one side of Mombasha [a.k.a. Mt. Basha] Lake a floating island, containing about two acres of land, became released and is now dealing in Wind Lake, situated 18 miles from this city, near Monroe. Hunters are having fine sport with the foxes and raccoons thus imprisoned.



Rockland County Messenger, 22 October 22, 1896, adds,

The island is about three acre in extent and is composed of vegetable matter and covered with trees and brush. Previous to the storm it had been fastened to the shore with ropes.

Muskrats

The sphagnum-covered floating islands of Pennsylvania's 16-acre Cope Pond contain such bog plants as Leather Leaf, sundews and pitcher plants. Robins and red-winged blackbirds build nests on the islands, and muskrats have generally two or three winter cabins on the islands by mid-November.

J.A. Nieuwland, "Habits of Waterlily Seedlings," American Midland Naturalist 4.7 (1916), on the floating island in North Bankson Lake, Michigan,

Should the water of a pond lower and leave plantlets with one or two aquatic thin leaves exposed to air, no more aquatic foliage is produced, but only aerial thicker leaves. Such changes from water exposure to air exposure of foliage and back again are rapid and frequent, due to the fact that the rise and fall of the so-called "floating islands" or muskrat feeding-places occur. These animals undermine large patches of root-entangled bottom which rises and small islands float about.



Iguanas

Reptologists have proven to be adept at genetically tracing the spread of their subjects from island to island by floating conveyance. Iguanas have merited special attention.

"Steaming Through the Panama Canal in Launch," Omaha Sunday Bee, January 11, 1914,

Farther out on the lake we sail about the shores of beautiful Islands, and we now and then pass floating Islands, consisting of tropical swamps which have been lifted from their foundations by the water and are carried by the winds here and there over the lake. Some of these islands are of several acres in area, and they rise and fall with the waves made by our launch as we steam by. On some of the floating islands are birds, and on one I saw an iguana, the giant lizard of this part of the world, which is as big as a cat and whose meat tastes like young chicken. Some of the islands have bamboos upon them, and upon some are beds of papyrus, similar to the famous bulrushes of Egypt in which the cradle of the baby Moses was laid.

"A Phylogeny of Iguanidae," Phylogenetic Relationships of the Lizard Families (1988) by R. Etheridge and K. De Queiros.

*An even more spectacular successful rafting can be deduced from the occurrence on Vanua Levu, Fiji, and on the Tonga Islands of the endemic, arboreal lizard *Brachylophus fasciatus*; its relatives in the iguanine group of iguanids are found on Galapagos and in the Americas. Its ancestral founding population apparently crossed more than 10,000 km of ocean.*



"Over-Water Dispersal of Lizards due to Hurricanes," Nature 395:556 (1998) by Ellen Censky, Karim Hodge and Judy Dudley.

In 1995, as a result of hurricane damage a month earlier, an extensive mat of logs and uprooted trees some of which were more than 30 feet long and had large root masses washed up on the island of Anguilla, taking two days to pile up on shore. It was thought, on the basis of the distributions of lizards which travelled on it, that the mat had drifted from Guadeloupe, a distance of about 270 km.

*At least 15 large lizards (*Iguana iguana*) including several individuals of each sex colonized the Caribbean island Anguilla after about one month's drift on such a raft across 270 km of ocean. A female with enlarged ovarian follicles was seen 29 months after the colonization, demonstrating post-dispersal survival and possible reproduction.*

Squirrels

If one believes, "Floating Islands," The Wonders of the World, in Nature, Art & Mind (1850), Henry Ince and Robert Mudie, Eds,

The mind naturally recurs to the history and habits of the grey squirrel -- an animal abounding in the woods of North America, and is also very numerous in Lapland; they assemble in numbers from all corners, and soon form an immense troop. The place of rendezvous is generally a neighboring lake: they then search for a piece of pine bark, which they sometimes find on the margin of the waters ; they drag or push it in, mount upon it in great numbers ; elevate their brushes to serve them instead of sails, and then committing themselves and raft to the mercy of the waters, land wherever the wind may direct them.



Giant Ants

Ants may be smaller than a jaguar, but can be likewise troublesome, "Giant Ants in Rosario" La Nacion, November 19th, 1998,

A significant number of giant ants, which can reach up to three centimeters long, fifty times more than domestic, appeared on the coast of the city.

The ants were discovered in recent days in the north of Gran Rosario, on the coast of Parana, at the height of the towns of Fray Luis Beltran and Capitan Bermúdez. The director of the Ecological Farm Curupí of Baigorria, Alberto Sanguinetti said that it is ants' relatives called African warriors, or crowds, "and that originate in tropical areas. Sanguinetti said that insects arrived from Brazil on camalotes dragged by the latest rising Parana River.



And the year following, "Giant Ants in Southern Santa Fe," New York Times, November 10, 1999,

The giant ants, which last year terrorized the inhabitants of several villages in southern Santa Fe, are back. This year they were seen by the neighbors of Casilda, a town 60 miles south of this city, who gave the alarm about the presence of insects.

Unusual ants, about three inches long and frightening appearance, were discovered in November last year on the shores of the Parana River, at the height of Baigorria-town located 25 kilometers north of the town-, and identified as Amazon army ants.

According to the testimony of the inhabitants of the region, the insects arrived perched on numerous camalotes that, at that time, sailed downriver favored by the rising river and quickly spread through the bushes that exist in the coastal shoreline and islands.

Giant Bullfrogs

Clarence Crandall's "The Frog of Floating Island," Berkshire Evening Eagle, August 11, 1949, recollects a floating island in Onota Lake, Massachusetts, some 50 years previously, and its great bullfrog.

One early evening recently, with some friends, I was motoring along the easterly shore of Onota Lake, an old time favorite boyhood of mine, haunt when the familiar landscape suddenly recalled to mind my old time friend, the amphibian recluse of "the floating island" there half a century or more ago.



Most of those familiar with the incident either have moved to distant cities or have answered to Father Time's insistent beckoning and the veil. To relate have stepped behind So the it behooves me details so that, eventually it may become another legend pertaining to this beautiful lake, like the one relating to the white deer that used to frequent its shores when the Indians prowled through the adjacent primeval forests.

The "island" referred to was located in the so-called "little pond" north of the channel, where in days of old an old road, now largely submerged, used to cross the lake. The "Island" had apparently broken away from the swampy mainland in the west shore, possibly under the stress of some heavy storm at the period of high water. It consisted of a mass of roots, moss, soil and underbrush with a few saplings. It floated idly about in the "little pond" varying its direction and location at the behest of every lusty breeze.

The only permanent resident of the island, apparently, was a gigantic bull frog. Those few who were privileged to get a fleeting glimpse of it, from a distance, described it as a real goliath of frogdom, with a pair of great, glistening legs that had a strong gastronomic appeal to the closely knit fraternity of connoisseurs to whom frogs' legs, dipped in egg batter, rolled in cracker crumbs and fried in butter were a chef-d'oeuvre supreme. Apparently the frog either had an instinctive awareness of this menacing, deep human yearning or, like most recluses, didn't crave for close contact with mortals. For at the sound of a distant paddle or oar, indicating the stealthy approach of a boat, he would take to the water at once with a loud splash and would be seen no more that evening.

Though an ardent lover of fried frogs' legs, I never took part in efforts to bag this old hermit. I developed a sentimental attachment for the old fellow. As I moved about the lake shores in the twilight after the sun had set, I grew accustomed to the heavy booming voice of my old friend coming across the lake from his retreat on the floating island as he pleaded, ever more insistently, for a "jug-o'-rum." The deep bass of the old frog grew to be a part of the nocturnal summer lake ensemble. It pained me to think that some hunter might succeed in silencing this well-known pleader some summer night.

But my old frog friend continued to voice his lonely nocturnal pleadings for the essentials of a nightcap during many summer evenings down through the years. I assumed, when eventually his booming voice was stilled, that he had lived his allotted years and had finally died like a gallant amphibian gentleman, with its legs on. Had it been otherwise and he had been caught and ended up in a frying pan, I feel assured his captor would have broadcast to the world his success, due to the frog's great size. I am glad that no such announcement ever came. He lived like a gentleman, even though a recluse, and was entitled to die like one.

The floating island, freed at last of its only resident, eventually broke up in a storm and disappeared, thus removing the remaining tangible factor in the old-time picture.

Almost legendary stories eventually spread among the cult of the frog-eaters regarding the gigantic size of my old amphibian friend. Most of them were palpably mere exaggeration.

But one of these stories rather appealed to my possibly too credulous ear. It was related by a member of the frog eaters' cult who, as a Sunday school member in his youth, had been widely heralded for his sterling veracity. He said that one evening, as he was silently watching in a canoe, for the old frog' some distance from the island, the old frog gave one of its deep booming appeals for the much yearned-for jug.

"And believe me or not as you may see fit," said my friend earnestly, "the recoil from the giant frog's heavy bass caused the island to sink two inches in the water. The lake was like a mirror and I distinctly saw the ripples due to the disturbance. It proved the old law of physics that every action has an opposite and equal reaction."

It may have been so -- and then again it mayn't! Anyhow, he was a mammoth frog.

Another version, "The Wandering Island of Onota," Berkshire Evening Eagle, April 20, 1950,

Well over half a century ago, tradition has it, at some period of unusually high water when Onota Lake was lashed by tempestuous storm wind.-, a section of the western shore line of the "little pond" was torn from its age-old moorings and set adrift, doomed thenceforth, like a veritable miniature and inland "Flying Dutchman," to wander restlessly about the pond, responding to every vagary of the capricious breezes

Originally the island comprised quite a sizable piece, heavily covered with brush, lush swamp grass and occasional small saplings. The foundation consisted of the intertwined roots of the shrubbery covered by a foot or two of heavy soil made up, in general of muck, moss, dead bracken and decayed vegetation. It was sufficiently firm to permit one to land on it and amble about it was a favorite habitat of muskrats; trappers, aware of this fact, used to visit the island more or less frequently to garner a furry pelt or two with trap or rifle.

The dense undergrowth on the island served, crudely but effectively, the purpose of sails for this wanderer of the lake. It was seldom at rest for long. Varying winds would send it scurrying hither and join. This element of constant change in its locus contributed a unique touch to the lake scenery.

About the island, too, lurked the legend of the giant bullfrog, with the body and legs of an Atlas that made its home there for years. On many a soft, quiet summer night, when the lake was like a mirror, the great basso profundo of this amphibian artist would come booming across the water, serving to render the night articulate. Tradition even had it, that when one of those deep, booming "jug-o'-rums" started, the recoil caused the island to submerge a bit, as evidenced by allegedly perceptible ripples about its shoreline. I never, personally determined the veracity of this report. Many were the efforts of lovers of fried frogs' legs to sneak up, by stealthy canoe, on summer nights and rob the lonely nocturnal songster of his much coveted pair. But all such attempts failed. The frog had a keen ear, and at the faintest careless swish of a paddle, there would be the sound of a heavy splash from the direction of the island, followed by an ever-widening circle of ripples, and the concert came to an abrupt end for that night. The frog was one artist who never permitted his egotism to entice him into responding to a possibly fatal curtain call. In consequence, so far as the records go, he lived his allotted years, sang to many a moonlit night and died, at last, like a gentleman, with his legs on.

As the swift years sped by, the island, wandering ever hither and yon at the winds' command, grew smaller and smaller as the storms tore bit after bit from the floating mass. For a time, at last, an old friend has informed me, it was anchored on the easterly end of the "old road" across the lake, to which final haven of repose a roaring west wind drove it. There it was eventually resolved into just a mass of amorphous floating debris -- its long hegira at an end. It disappeared, thus, as a tangible entity, from the lake landscape where for so long it had been a unique feature. But in memory, we oldsters can still see the old island scudding across the little pond at the behest of an insistent Berkshire breeze

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For more about the floating island itself, see Chapter 68.

Southern Screamers

As there's really no end to the birds that frequent floating islands, we'll confine our birdwatching to the Southern Screamers on the floating islands of Ibera.



Rhinos

We pass along this unlikely assertion in Chapter 37, but if rhinos indeed tromp upon islands of sudd, we'll not trespass.



Hippopotami

Victor Meunier, Adventures of the Great Hunting Grounds of the World (1869), relates the correspondence of a traveler in Egypt:

We remarked on the ground numerous traces of the steps of hippopotami. It was evident that we were in a part much frequented by them. We soon noticed on the river a kind of black. It was the back of an immense hippopotamus. We afterwards saw a second and less voluminous one.



St. Johnsville News, January 25, 1911.

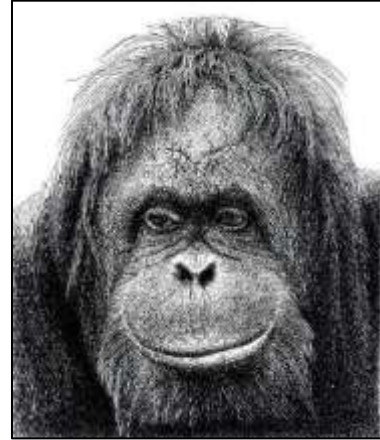
The hippopotamus is a sort of floating island which inhabits the African rivers.

Orangutans

The Great Horn Spoon, (1928) by Eugene Wright

It is common enough to see men on an island, but to see men on a floating island in the Java Sea stirred the myth-cells of my brain. What on earth were they doing there? Why didn't they get on a log and paddle ashore with a stick? Thus when the thought of rescue came, it was tempered by caution; and when, as we came closer, all three of the men disappeared behind the foliage, I began to suspect that we were very close to danger.

The island was fully two hundred and fifty feet long, and we approached to within a safe distance of the nearest point, which sunk off into the water a mass of roots and matted foliage. We felt nervous about going any nearer.



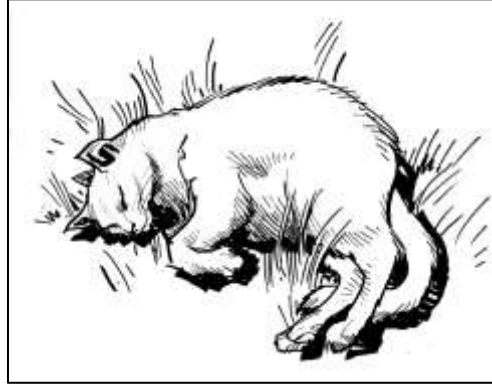
The men did not show themselves, and if armed with arrows or poisoned darts would be in a position to slaughter us, if that was their motive. We backed away, and were commencing to parallel the island at a safe distance when a black shape stepped from behind the foliage; two others followed, and I saw an immense orangutan and two smaller ones standing perfectly erect.

Both of us were silent with astonishment. After we had watched them for some moments, we came closer, and the largest of the animals, an old male, advanced a few steps making hoarse throaty cries. He stared at us with his fingers touching the earth, his beady eyes penetrating my own as, though pleading for help on the basis of our ancient kinship.

They were marooned on the floating island. They had been marooned for weeks, perhaps months; for there was not a coconut on the few small trees; and the earth had been torn up the entire length of the island in their search for grubs and ground animals. But we were powerless to help them. Even though their throaty moans and their actions plead eloquently for assistance, and, although they seemed too utterly helpless and woebegone to fear.

Dead Cats

In "Mechanisms of the States of Sleep: A Neuropharmacological Approach," Research Publications of the Association for the Research in Nervous and Mental Disorders (1967), Michel Jouvet presents the results of depriving cats of sleep by putting them on a floating island so that when they fall asleep they fall into the water and awake. Unsurprisingly, the cats develop abnormal behavior and eventually die.



Veritable Zoos

William Bartram, The Travels of William Bartram (1791), on floating islands in the St. Johns,

We see not only flowery plants, clumps of shrubs, old weather-beaten trees, hoary and barbed, with the long moss waving from their snags, but we also see them completely inhabited, and alive, with crocodiles, serpents, frogs, otters, crows, herons, curlews, jackdaws, &c. there seems, in short, nothing wanted but the appearance of a wigwam and a canoe to complete the scene.



"A Weird Floating Island," Washington Post, October 4, 1925, describes the arrival of a 50-acre floating island in Buenos Aires in the 1880s carrying a zoo-full of creatures.

As to the actual "voyagers" on these camalotes I can certify as to these. I had full opportunity in the case of the large one we "followed" to examine fully every bit of it with a pair of fine field glasses and I saw a large number of wild pigs, dangerous tusked brutes, alligators that were all of seven to ten feet long, caymans (a species of alligator or crocodile) nearly as large, pythons (boas) that ranged from four to five feet to one monster that, as nearly as could be estimated, was fifteen feet long.

Also, there were fer-de-lances, coral snakes and spitting adders -- all easily recognizable by color or shape-in quantities, and as for lizards, the thing was alive with them, from big fellows four feet long to very small souters, all of them on the go as the camalote neared shore or twisted and turned, There were only a half-dozen or so of monkeys and they roosted at the tops of the few trees -- they knew when they were safe. There were a few birds, evidently those who had nests in the trees and bushes.

As reported in "Floating Islands, Homeless Wanderers on Great South American Rivers," New York Tribune, August 27, 1905,

One of the most curious features, and a proof that they have made a long voyage, at least art a thousand miles, is the fact that they are alive with tropical snakes, the Zoological Garden in Buenos Ayres having been enriched by forty different species taken from the islands in passing, and several deer, a puma, or wild cat, and any quantity of parrots and monkeys, have been passengers on them, the latter falling victims to the wiles of their civilized prototype, the

small boy, and both snakes and monkeys being offered for sale on the streets of some of the towns along the river.

"A Weird Floating Island," Washington Post, October 4, 1925,

Lastly, to go into veritable history. In the middle eighties, the year of an unprecedented rainy season and high water in all the three rivers, a camalote turned itself loose which owned the Parana for days, and almost stopped navigation above Parana and Rosario. It was estimated to contain nearly 50 acres, and when it came just above Buenos Aires it took the south channel which washes the north portion of the city and went aground at Palerino park, then the finest and most aristocratic suburb of the city, The inhabitants of the camalote went ashore joyously and unanimously and the inhabitants of Palernio park and its vicinity woke up to find themselves so beleaguered that they dared not move out-of-doors, so sent mounted servants into the city for aid. The city sent its police force armed with machetes, clubs, pistols and rifles and it was three days before the last of the invaders was killed and the list included every critter I have mentioned above.

"Scientists Will Spend Month on Mysterious Sargasso Sea," Brooklyn Daily Eagle, February 15, 1925,

Dr. Heche says he does not know what he will find in his square mile of ocean, but he is prepared for practically anything; If there are animalculae. bacteriarla of other than animal or vegetable kind -- as undoubtedly there are -- he will test them, weigh and measure them to see how they compare with the species already known. If there are strange new fish, shell fish, crawling eels, flying fish and walking fish, he is ready to capture them, too, and bring them back to civilization. If there are rich tropical vegetable growths on the floating raft of seaweed, he wants to know about that. And should he find even men oh board any of the lost ships. is taking along the means to feed and clothe them and give them a free trip to the U.S.A.

W.C. Allee and Karl Schmidt's Ecological Animal Geography (1937) notes that the fauna of the La Plata coastal forests differs from that of the neighboring pampas.

The woods bordering the La Plata have a fauna very different from that of the neighboring pampas, especially snakes, amphibians, and brilliantly colored insects of northern origin. Large streams at flood time carry driftwood, tree trunks, and even whole floating islands, and thus transport not only many small forms but a few large animals. The Paraguay occasionally brings large snakes, crocodiles, and jaguars to the neighborhood of Buenos Aires.

Referring to the Great California Flood of 1861-1862, the Mountain Democrat, January 11, 1862, ,

The ground squirrels and gophers are ... floating about in all directions, drowned, or swarming thickly on old stumps, logs and trees, ravenous with hunger.

And two weeks later, February 1, 1862,

Large numbers of coons are seen floating on driftwood ... The beavers, too, have been drawn from their houses ... They seek the edges of the floating islands, ... The coons and beavers are in bad luck as well as the rest of mankind'.

As for Amazonia, we quote from "The Floating Forest: Traditional Knowledge and Use of Matupá Vegetation Islands by Riverine Peoples of the Central Amazon," PLOS ONE 10:4, April 2, 2015, by C.T. de Freitas, G.H. Shepard, Jr, and M.T.F. Piedade. Matupás are further discussed in Chapters 36 and 48.

The people of Amanã consider matupás to be places harboring many animal species, both on top of the vegetation island as well as in the water immediately around and below.

Percentage of interviews in which each animal was said to occur in and around matupás

Local name	English name	Species	Frequency of Citation (percent)	
			Matupä in formation	Mature matupä
Jacaré	caiman	<i>Caiman crocodilus</i> ,	72	86
Cobras	(snakes)		64	80
Tracajá	yellow-headed	<i>Podocnemis unifilis</i>	60	71
Capivara	capybara	<i>Hydrochoerus hydrochaeris</i>	28	66
Onça	jaguar, puma	<i>Panthera onca</i> , <i>Puma</i>	8	49
Peixe-boi	Amazonian	<i>Trichechus inunguis</i>	52	46
Insetos	(insects)		60	43
Pirarucu	arapaima,	<i>Arapaima gigas</i>	36	43
Tambaqui	tambaqui	<i>Colossoma macropomum</i>	32	43
Peixesa	(fish generic))		28	26
Pássaros	(birds)		28	26
Aranhas	(spiders)		12	9
Rato	(rat, mouse)		20	6
Sapos	(frogs, toads)		8	3

Carnivorous Flora

The carnivorous *Drosera anglica* thrives in a soil substrate entirely composed of living, dead, or decomposed sphagnum. Although most of the plant's prey consists of small insects, small butterflies, damselflies, and even dragonflies, can become immobilized by the plant's sticky mucilage. The plant's tentacles pull the victim to the center of the leaf, which closes around its lunch. Once the prey has been digested and the resulting nutrient solution absorbed, the leaf unfurls, leaving the prey's exoskeleton behind.



Mermaids

Bruno Damerau's "Rund den Banktin-See mit 100-Stationen-Bummel durch Gerdauen nach 1900," Heimatbrief Kreis Gerdauen, December 1999, relates a tale of Wassernixen or mermaids appearing on the same island that Rast counted 100 cows..

As the lake of Gerdauen was drained 1868, however, neither the cow count nor the mermaid can be verified.



El Monstruo

Until it was drained, Chile's Laguna de Tagua-Tagua flooded during wet years, and was notorious for its "chivines," floating islands formed by a densely-interwoven network of roots, resilient enough to bear the weight of a horse or cow or, if credit is given to Rafael Meza Ramirez' "El Chivin Grande," a story transcribed by his son Rafael in 2002, a bull that twice rode on the floating islands.

In Prima parte de la Miscelanea Austral (1602-03), Diego Davalos y Figueroa says that locals lived and gardened on one of the floating islands. Vicente Carvallo y Goyeneche describes the island in Historical-Geographic Description of the Kingdom of Chile (1789), but written closer to 1710.

The particularity of this lake is that it has small floating forests. It breeds in its banks some grass, whose few roots are short, thin filaments that detach easily, loosening many plants together into the water. Dust raised by wind falls on them. This mass produces some herbs, even the same program, until eventually becoming so thick that bushes breed in it. Pastured cows enter the grass. If it happens that a breeze blows in these circumstances away from the shore, a good chunk runs from one part to another of the lake according to the wind.

According to Pichidegua Historia (1831) by Claudio Gay,

It consists of floating islands that cover about half of the lagoon and along the direction of the winds, walking from north to south or east to west. I visited and after careful consideration and study well, I have not found them more than large piles of plant debris as convulvulus, pomageton, ranunculus and especially typha Arundo and other grasses entwined in a thousand ways, and on which other beach floating plants rotting, deposited a kind of extremely fertile land, which is increasing more and more by the destruction of other vegetables that are born among them, so that these islands gradually grow in both length and thickness.

W.S.W. Ruschenburger, in "A Letter from Dr. R. to the Editor, dated Callao Roads, April 15, 1832," American Journal of Science and Arts 23.2 (1833), summarizes Gay's letter to El Araucano, adding.

Almost half of the lake is covered by these islands which float from north to south, and from east to west, according to the direction of the wind... These islands, by a gradual augmentation in extent and thickness, will in all probability, till up and cover the whole superficies of the lake with their artificial soil

Charles Darwin mentions seeing the islands on September 14, 1834 in Journal of the Researches by Charles Darwin into the Natural History & Geology of the Countries Visited during the Voyage of HMS. Beagle (1839).

We had a glimpse of the lake Tagua-Tagua, celebrated for its floating islands, which have been described by M. Gay. They are composed of the stalks of various dead plants intertwined

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together, and on the surface of which other living ones take root. Their form is generally circular, and their thickness from four to six feet, of which the greater part is immersed in the water.

According to "Floating Islands." Chambers's Journal, April 13 1850,

When the wind is high, they are gracefully wafted across the lake, and are used by the neighboring inhabitants as natural ferry-boats.

Soon thereafter, Javier Sotomayor Errazuriz began to drain the lake. Geographical Dictionary of Chile (1897) on the former lagoon,

.It was also notable for the floating islets called chivines (of chivin, brim full) which is to forming the banks of the lagoon algae, grasses, confervae and other aquatic plants that wove its roots and taking consistency to support the weight of a beef animal, which sloughed away by the wind were to navigate the surface of that.

From "Floating Islands," American Architect and Architecture 83, January 9, 1904,

Darwin saw them in Chili during the memorable voyage of the Beagle. Lake Tagua-Tagua, for example, is noted for its floating islands. They are formed of the entwined stalks of dead plants, among which living vegetation takes root. They are circular in form, and from 4 to 6 feet thick. As the wind blows them about these islands frequently pass from one side of the lake to another. Horses and cattle are thus sometimes carried across the lake -- a unique kind of ferryboat is seen in action.

From Karl Reiche, Grundzüge der Pflanzenverbreitung in Chile (1907),

Tagua Tagua Lake, which has long been drained, was famous for its Chivines, i.e., floating islands, which consisted of a wattle of Typha rhizomes, Potamogeton, Ranunculus, etc., blown by the wind from the shore, detached and drifted around on the lake, where they served the waterfowl as nesting sites.

But perhaps more interesting is a legend quoted in he July 23, 1893 New York Tribune from a 1631 manuscript by Juan Ariello Oliva regarding an **Incan** legend, Biblical in scope. The portion regarding a floating island:

In view of the omen granted her, Llira, full of gratitude, resolved to offer: her son a sacrifice, She built a pile of wood and laid her child on it, but just as she was about to apply the torch, a condor descended from the heights, and seizing the boy in its claws, flew to a floating island called Guayan. There the youth, hidden for ten years, maintained himself on roots and fruits.

Guayanay had reached his twenty-second year, when a terrific tempest; drove his floating island to the mainland and left it stranded at a place inhabited by a fierce and barbarous tribe. Impelled by curiosity, some of those people boarded the island, discovered the young man, and led him prisoner to their Cacique. This chief had him imprisoned, intending to sacrifice him at an approaching festival.

The Cacique's daughter, Ciguar, loved him at first sight and made up her mind to save him, cost what it might. She found an opportunity to tell him that she would risk her life to rescue him if he would let her accompany him where fate might direct his steps, to which he replied that he would gladly devote his whole future to her.

During the night Ciguar managed to effect the escape of the prisoner and to elope with him. In their flight they encountered six of the Cacique's men. Guayanay killed four; two escaped and carried the news to the chief. But Ciguar had a canoe already prepared; thus they managed to get away with four servants devoted to her.

After several days they came to an island which, on closer inspection, proved to be Guayanay's own floating home that the winds and tides had again carried far from the mainland. There the young couple made their home and lived many years, blessed with a large family.

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After a long time the island was accidentally discovered by the son of a Cacique named Thome, Lord of Quito and the places up to the seashore. Because of a heinous crime, that chief had condemned his son to death, but, with six friends, he had escaped, embarked in a canoe and started out with the intention of remaining away until his father's ire should have died out. The party endured much hardship, starvation had seemed inevitable, but they had the good fortune to come within sight of the floating island, where they landed and were kindly received.

But perhaps yet more notable was the presence -- or at least the perceived presence -- of a monster.

From tales of disappeared livestock emerged a legend about a monster that dragged cattle into the lake. Armed groups of hunters were even organized to capture it.

Etching made in 1784, now in the Madrid National Library. From the attached documentation,

It did great damage, eating all manner of animals and drinking from the lagoon, until 100 men stealthily ambushed it with firearms and caught it alive. It measures three and a half rods long and its tail is bigger than its body. Its legs are nearly a quarter [rod] but its claws are much larger. Its mane reaches the ground so that it entangles around its feet. The upper tail...helps it to catch its prey. The teeth are some 30 cm long and the mouth is as wide as its face. Its horns are a rod and a half long and very well-turned, and finally, its ears are three quarters of a rod long.



And if a creature of the above ferocity weren't problem enough, the floating islands were haunts to other terrors. "La Leyenda del Rey Inca," in Leyendas de Tagua-Tagua (1980-1982) by Salvador Correa Larrain, recounts how the son of a local witch rode across the lagoon on one of the islands. That the story purports to be of an Incan king is perhaps inconsequential, but Tagua-Tagua in fact lies at the southernmost tip of the Incan empire.

Prehistoric Horses

Miguel Littin's El Bandido de los Ojos Transparentes (1999) turns to magical realism to uncover what lies under the floating islands of Lago Tagua.

Don Nazario and the Bamboo Cage

Friends, rural residents, people this famous villa, Don Nazario, the one who 12 years ago passed through these beautiful lands announcing that after a long and substantial conversation between a cow and a golden ox, a great Chilean earthquake would leave not one stone on another, but rather adobe on adobe, speaks to you.

Bow to the forces unleashed the very image of the Virgin of Carmen, holy patron and Queen of Chile, general of their armies, Mother and my Lady -- and so saying, the old sage knelt in the middle of the street while I was carrying, like a cross, my own confinement, which consisted, friends, of a cage made of bamboo tied by wire.

Now I'm here to reveal the new the phenomenon of nature, to announce new developments revealed to me in the heat of a sleepless night under the three levels of Lake Tagua-Tagua where between silts never seen, grow giant animals that have lived there since month eleven 1300 years, protected by the waters, mountains and swamps.

The floating islands burst with stems of living plants riding one upon another. On the surface are born new plants of unusual colors, circular flowers, submerged flora, emergent giant trees covered in flora of a thousand shades of green, mastodons and American horses thousands of years older than those which arrived with the Conquistadors. Aquatic birds fly above the flora of Tagua, the big and beautiful lagoon. Like the shattered lands of the southern archipelagos of which the Scottish bards sing, immobile islands, this is a palace of delight, a place of perpetual wonder.

For some, it is the eye of the sea, for others, the beginning of life. Mr. Darwin, the famous English scientist, spent three days and three nights watching, obsessed with the depths of its four levels where were skeletons remain, human skulls of whimsical shapes -- yes, friends of mine -- with skulls showing cranial operations performed in 1300 BC, teeth decayed and capped, ceramics discolored and worn down, mirrors, rings and ruby necklaces. And at level two, drilled stones, hearths and splendid bridal chambers, and I am speaking of 700 years before the present.

Remains of strange machinery, giant wheels, black grindstones lie buried in the silt of the blackish third level, 7,000 years ago. And though you, now at home preparing lunch, do not believe me, at level four -- which is the kabalistic number, the order of the universe and all that lives, the four letters that fertilize life, the four letters that are life, four, the mother and four, the essential duties to love, play, laugh and enjoy -- at that level are the remains of unidentified animals, only comparable to the Pali Aike, what this same gentleman found in Patagonia, unknown to the world.

And here, in Lake Tagua-Tagua, within three layers which were sedimented through thousands of years, an incredible accumulation of organic matter has been produced, derived from aquatic plants, forming the dark soil which evaporates into sulphurous gases.

Calcium carbonate, lacustrine clay which cleanses every wound of the body and rejuvenates the soul, again gives birth to dreams and desires to live, fertilizing the eggs and reviving the yearnings accumulated over 8,000,000 years counted from month 13 to 17, which was the measurement of the ancient people of this land, judging from marks deciphered from a calendar inscribed on the cavern walls of level four in which lived a civilization of tiny men and women sunk in the depths of the earth. These people transformed over time into barbarians who walked naked upon the land and were called Chiquillanes, the first inhabitants of the planet.

Children

"Floating Islands, Homeless Wanderers on Great South American Rivers," New York Tribune, August 27, 1905, on the Río de la Plata and the Paraná following the great floods of that year,

One of the most curious passengers to a was an Indian baby, the island on which it was floating going ashore near Rosario, about a hundred miles up the river from Buenos Ayres; and though the baby was nearly dead from hunger and exposure when found, by careful nursing he was brought around. How far he had floated or how he ever got on the island will probably always be a mystery, as there is little probability that his parents will be found.

Renegades

From The History of Paraguay (1769) by Pierre Xavier de Charlevoix,

To the east of Rio de la Plata, and about the twenty-eighth or twenty-ninth degree of South latitude, there is a lake of a very irregular figure, eighty leagues in length, and very narrow in proportion to its length. This lake, in the ancient maps, is called the lake of Caracaras; and, in the more modern, that of Ybera. From the eastern extremity of this lake there issue two little rivers, Rio Mirinay falls into the Rio de la Plata, and Rio Corrientes into the Uruguay. Father del Techo contents himself with saying that the lake, or as he calls it, the marsh of Caracaras,

communicates with the Parana. I have elsewhere observed that the name of Parana is often given to that part of the Rio de Paraguay and the mouth of the Uruguay.

The same historian adds, that this lake is covered with floating islands, like those in a little lake near St. Omer; and that they afforded a retreat to Indians of different nations, especially the Caracaras, who having inveigled some Spaniards among them, in 1553, by applying to them for assistance against their enemies, perfidiously massacred them; and actually harbored some renegades of the reduction of St. Anne, and the murderers of Father Espinosa. The impunity they enjoyed, in consequence of the difficulty of attacking them, had rendered them very insolent. They frequently committed great disorders in the countries about the lake, and had lately burnt to the ground the church belonging to the Order of St. Anne.

Cited regarding the Indian infant, "Floating Islands, Homeless Wanderers on Great South American Rivers," New York Tribune, August 27, 1905, also makes mention of escaped fugitives.

The Indian legends are full of stories of the escapes of fugitives on the "camalotes," and from the size of the islands, it is easy to believe that some of them are founded on fact.

And So Many More

We could surely add to the list, but we've already enough for which to watch

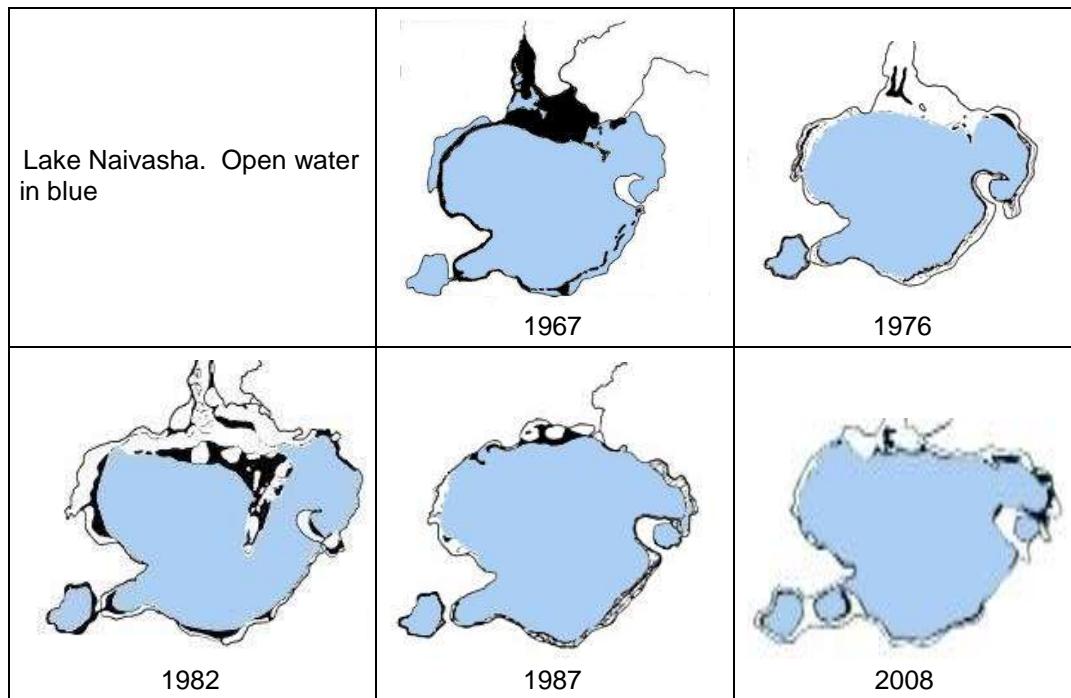
CHAPTER 46 SAIL IN TWO DIMENSIONS

Other chapters show floating islands here today and there tomorrow. In this chapter we'll note studies where the spatial process is documented in two dimensions.

Kenya

Lake Naivasha is at the highest lake in Africa's Rift Valley. There is no visible outlet, but as the lake water remains relatively fresh, it is assumed to have an underground exit. *Salvinia molesta* appeared in the early 1960s, and by the end of the decade covered 2 to 3 square kilometers, dropping the dissolved oxygen concentration under the mats to 10 percent saturation, compared to 64 to 85 percent in the open water. The mat of almost disappeared by the mid-1980s, however, when inflow was limited.

By 1987 the lake level returned to that of the 1950s. Papyrus (*Cyperus papyrus*) plants, formerly floating on the surface, became relegated to the margins, but water-lilies (*Nymphaea caerulea*) began germinating, and extensive beds of such submersed plants as *Ceratophyllum demersum* and *Potamogeton* spp. reappeared.



Malawi

The combined actions of wind and waves loosen swamp vegetation and cause it to drift into the open waters of Lake Malawi as floating islands composed mainly of papyrus and reeds. *Phragmites communis*, and *Typha* sp.

The navigation chart for the southwest arm of the lake warns that "towards the end of the rainy season, large floating islands of reeds and sudd occur in this vicinity." The islands are seen at all times of the year, but are most abundant during the rainy season, January through March. During

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February, as many as 20 floating islands per day drift within sight of Cape Maclear. Littoral fishes have been collected from these islands as far as 8 kilometers from the nearest land. The vegetation thus may serve to transport these fishes across passages of deep water.



Island length 14 meters. Mainly papyrus.



Island length 21 meters. Mainly reeds.

Green dots indicate the locations of five islands at one point in 1981. The red line indicates a 3-week track of a sixth island.

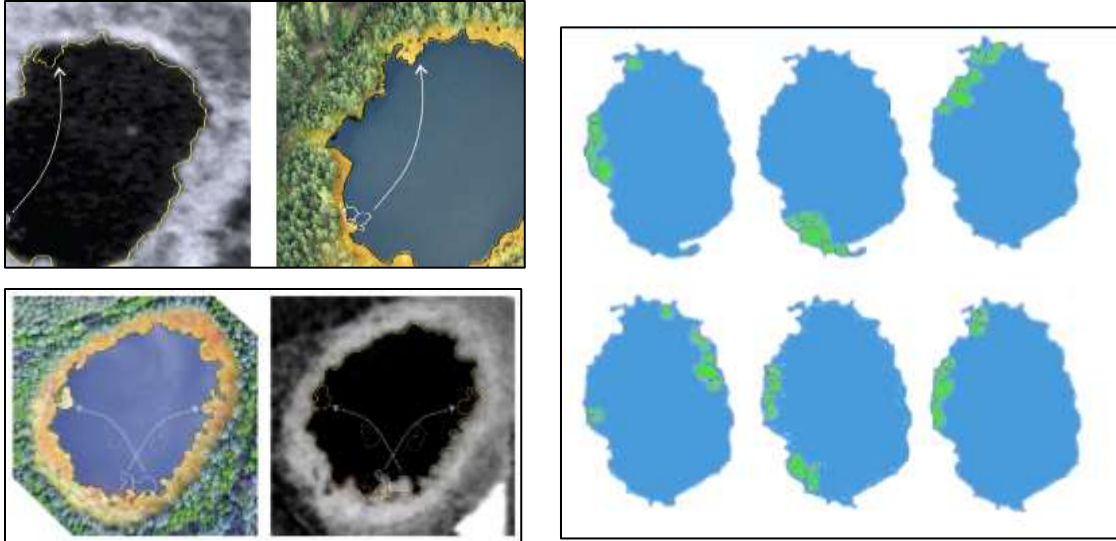


One of the floating islands.



Poland

"Shoreline and Surface Area Changes Induced by Floating Islands in Peatland Lakes," *Limnological Review* 11:4, 2011, by Grzegorz Kowalewski, describes three lakes of less than one hectare in the Tuchola Pinewood Forest. Below are some of the island transits, 1951-2011.



Bulgaria

"Estimation of the Dynamics of Floating Islands in the Territory of Sreburna Lake, Situated in the Territory of Bulgaria, Using Aerospace and GPS Data in the Period 1979-2005," Recent Advances in Space Technologies, 4th International Conference (2009), Iva Ivanova, Romen Nedkov, T. Michev and N. Kamburova· examines a lake in the Sreburna Reserve on the River Danube

Apart from the reed (*Phragmites australis*), herbaceous vegetation includes common bulrush (Broadleaf cattail, *Typha latifolia*), garden yellow loosestrife (*Lysimachia vulgaris*), climbing nightshade (Bittersweet nightshade, *Solanum dulcamara*), stinging nettle (*Urtica dioica*), marsh fern (*Thlypteris palustris*) and water figwort (*Scrofularia alata*) and two tree species -- grey willow (*Salix cinerea*) and purple osier (*Salix purpurea*).

Between 1979 and 2005, the islands' area has varied significantly. Decreased water level has led to the fusion of the smaller islands into one, the spread of the reed beds and the enlargement of their area.

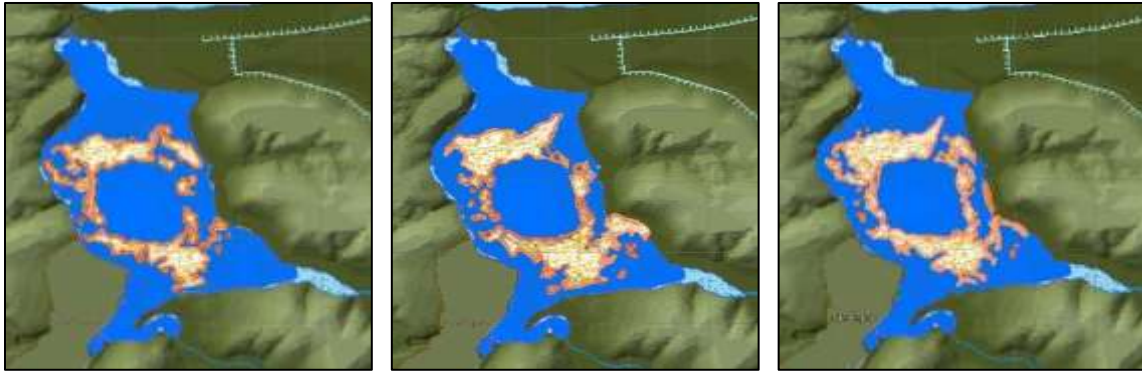


1979

1988

1992

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2000

2001

2005

The areas

Year	Floating islands (hectares)
1979	163
1988	168
1992	507
2000	110
2001	90
2005	122

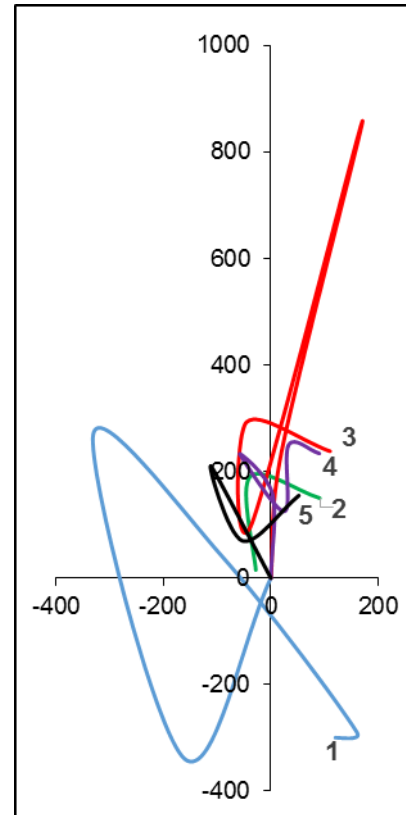
To examine island movement, five islands of relatively stable form and distinctive year-to-year appearance were tracked.

To the far right, island travels, per 3 to 5 observations over the 28 years. Scale is in meters



The mapped distances. Actual routes would have been additionally complex.

Island	Travel (m)
1	1800
2	400
3	2000
4	600
5	500



No island ended up more than a few hundred meters from where it started, though islands 1 and 3 journeyed roughly the equivalent of the lake width in doing so.

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Another study by the first two authors of the preceding paper, "Actual State of Danube Delta Biosphere Reserve, Using Aerospace and GPS Data," in Remote Sensing for Science, Education, and Natural and Cultural Heritage (2010), examines the floating islands of Lumina Lake, also in Bulgaria. The islands are generally 0.5 to 1.5 meters thick, of reed rhizome and roots of other aquatic plants mixed with organic remains and soil.

The number of observed floated reed islands in 1972 was 13, with a total area of 68 hectares. The water surface was 1,317 hectares. In 2009, the count was 32 and the areas were 228 and 1,824 hectares.



1972



2009

Island routes were not tracked, but comparison suggests that the island located near the end of "Lumina Lake" has moved little and the other islands are new.

Pennsylvania

"A Few Odd Islands. Described by the Wayne County Man," New Ulm Review, May 3, 1899 PA

They Float Around In a Careless Sort of Fashion, With an Occasional Queer Freak, One Being to Spin Around Like a Monster Top.

I recall a peculiar thing that happened years ago to the island in White Oak pond, near Aldenville, some eight or nine miles to the north and west of Honesdale. By the way, this particular island is the largest of the lot; so large, in fact, that the center rises fully ten feet above the water line. The farmer owning this island proposed erecting a summer house on the elevation, but was obliged to give it up owing to his inability to lay a proper foundation without driving piles, and to do that would result in nailing the island to the bottom.

Well, as I was going to say, this island one day eloped with a southwest zephyr, which promptly deserted as soon as it had got its consort into the middle of the lake. There it floated in a sultry summer sun, with no means of motion in itself and milking time approaching. Presently the edge of a little breeze from the northwest struck the wanderer on the port quarter and things began to look a little brighter. Unfortunately for the island, however, at about the same moment that the first gust landed a wind of equal intensity came up from the southeast and its edge caught the island on the starboard bow. In less than a minute these two contrary winds had that island spinning around like a top. You may believe this or not, as you like. I can show you the island any time that you'll come up to the old county.

Indeed, a spinning island?

Before we dismiss the Wayne County Man as out of hand, however, we should visit southern Africa.

Botswana

S.C. Child and P.A. Shaw's "A Floating Island in the Okavango: Some Observations Made by Brian Wilson," *Botswana Notes and Records* 22 (1990) makes note of rotation.

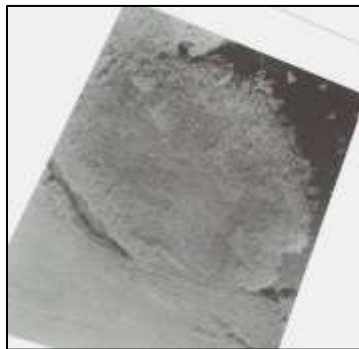
In the Okavango Delta the blockage of channels by Papyrus mats, and the hydrological changes that result, have been well documented, whilst human use of Papyrus mats as a means of downstream transport has been reported from the 19th century onwards. However, it is difficult to monitor individual vegetation mats or to determine their fate over long periods of time. This is due largely to the homogeneity of the vegetation community and difficulty of access in the permanent swamp of the Okavango Delta.

*One exception to this is an unusual floating island' in the Panhandle, which has been readily discernible from aerial photographs since aerial reconnaissance began in that area in 1944. The sub-circular island, measuring approximately 160 m x 125 m, lies within an elongated lagoon measuring 400 m x 200 m. The island, like the surrounding swamp, is composed largely of Papyrus, with subsidiary communities of sedges and the aquatic fern *Thelypteris*. Deep water underlies both the island and the lagoon margins.*

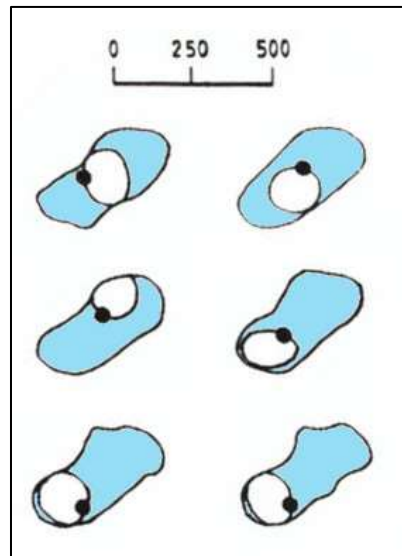
How such a floating island could originate is not clear. It is probable that it has evolved within the lagoon rather than being derived from outside, either by direct growth, or by breaking away from the lagoon margin. Once formed it is free to drift in response to wind-derived currents until it becomes enmeshed in the lagoon margins. In all of the photographs it has contact with at least one point on the lagoon edge, and it is probable that it undergoes long periods of stability in a single position, until liberated by strong winds.

Island position, 1944-83, rotation shown by the dot.

1944, 1962
1967, 1969
1974, 1983
Scale in meters



Close-up, 1990, the island firmly locked into the southern position, although not yet fully contiguous with lagoon margins,



Summary

We've no lack of documentation confirming movement of floating islands, but relatively few studies in which the complexities of the journey is charted. The few 2-dimensional studies that we do have show islands scooting in roundabout pathways, expanding and contracting in area and turning this way and that in the process.

CHAPTER 47

SEE IF IT'S A SHIP



WorkBoat, September 2013

Watercraft, especially those of large size, have been described as "floating islands" for centuries.

Ships Said to be Floating Islands

In A Declaration of the Affairs of the English People [That First] Inhabited New England (1662), Phineas Pratt recalls the years 1622-1623.

Some of our company asked them, how long ago was it that they first saw ships? They said they could not tell, but that they had heard men say that the first ship they saw seemed like a FLOATING ISLAND, as they supposed broken off from the mainland, wrapped together with the roots of trees, with some trees upon it. They went to it with their canoes, but seeing men and hearing guns, they made haste to be gone.

A reflection from George Harris, "Domestic Every-Day Life, and Manners and Customs in This Country, from the Earliest Period to the End of the Eighteenth Century," Transactions of the Royal Historical Society 7, 1878.

Had any of us been living at the time of which I am now speaking [the Norman invasion], we should probably have been told that a shepherd who was looking after his flock on one of the hills behind Hastings, first thought that he spied something very strange far out at sea, he could not tell what, but it seemed like a huge vessel very long and flat. Afterwards, as it got nearer, it appeared like a FLOATING ISLAND. Still it approached the coast; and all at once, when the sun came out and shone upon it, it sparkled like a cluster of diamonds, and bristles seemed to spring up, which those who were watching it soon saw were spears; and they perceived also sails and flags of red, and white, and blue, and other different colors.

Crowned in Palm-Land. A Story of African Mission Life (1874), by Robert Nassau, describes the Rio Bono of Equatorial Guinea and the locals' interpretation of European ships.

Down the swift current of the Bonita, as of other rivers on the coast, are swept FLOATING ISLANDS of interlaced rushes, tangled vines, and water-lilies that, clinging to some projecting log from the marshy bank, had gathered the sand and mud of successive freshets, and gave a precarious footing for the Pandanus, whose wiry roots bound all in one compact mass. Then some flood had torn that mass away, and the pandanus still waving its long bayonet-like leaves, convolvuli still climbing and blooming, and birds still nesting trustfully, the FLOATING

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ISLAND glided past native eyes down the stream, out over the bar, and on toward the horizon of broad ocean.

What beyond? Native superstition said that at the bottom of the "Great Sea" was White-Man's Land; that thither their own departed found their happy future, exchanging a dusky skin for a white one; that there, white man's magic skill at will created the beads and cloth and endless wealth that came from that unknown land in ships, in whose masts and rigging and sails were recognized the transformed trees and vines and leaves of those FLOATING ISLANDS.

First contact with Europeans is a common theme of American indigenous legend. When the arrival was by sea, a common perception of the ship was that of a "floating island." Let us begin with the Pacific exploration of Captain James Cook,

William Williams' "On the Visit of Captain Cook to Poverty Bay and Tolaga Bay," Transactions and Proceedings of the New Zealand Institute 21 (1888) chronicles the Rongowhakaata people first thought that the Endeavor must be a floating island.

The party of natives thus encountered was not the same as that which had been seen the evening before. According to the Maori tradition, the ship had been seen coming into the bay the day before, and was thought to be a FLOATING ISLAND; and this was a party of the Rongowhakaata tribe, who had come from Orakaiaapu... for the express purpose of trying to take possession of the ship, and hence their hostile attitude.

"The Story of the Princess Loe," Overland Monthly and Out West Magazine 11.62 (February 1888), by F.L. Clarke, is another story that involves the perception of Cook's ship as a floating island. We'll quote just a bit of the beginning.

The story of Loe as here told is founded on certain facts connected with the second and last visit of Captain Cook, the discoverer of the Hawaiian Islands, to those shores. The adventures of Loe and her lover Kanui are a favorite theme with some of the old native story tellers, by one of whom the present writer was furnished with the outline of the following little romance.

And now the time was close at hand when, at the next great kapu, or sacred feast, Kanui and Loe would be united with all due solemnity by the great kahuna, or priest of the king, - when a wonderful thing happened! A small FLOATING ISLAND, whose trees dropped and renewed their strange foliage daily, entered Kealakeakua Bay, on whose shores was the village where the young betrothed pair lived. This curious thing was crowded with strange beings with thin white faces. They had loose skins, (their clothing,) like those of the snake-gods of the natives' mythological ancestors.

Not only did the white strangers take the offerings of food and ornaments that were made to them, but they also demanded that wives should be given them from the fairest of the women of the land. Cheerfully were their requests acceded to, the simple natives considering it a high honor that their daughters should be affianced to the demi-gods of the FLOATING ISLAND.

The plight of the princess becomes inconsolably sad, but at last progresses to a happy ending. We'll leave it to the romantics to finish.

A portion of a tale from Vancouver Island, as told by Gillette Chips and transcribed in "The Contact Period as Recorded by Indian Oral Tradition," Captain Cook and the Spanish Explorers on the Coast Sound Heritage 7 (1978), by Barbara Efrat and W.L. Langolis, eds.,

I am going to tell you about when the first white man appeared on Nootka Sound. The Indians were dancing about when the first white man appeared in Nootka Sound. The Indians were dancing around the island -- they called the schooner an island. They said there's an island because big trees on it. Big trees on it

They say Indian doctors go out there singing a song, find out, try to find out what it was. Rattling their rattles.

Another version related by Chief George and retold by Ella Clark in Indian Legends of Canada (2011),

One day Chief Maquinna and Chief Nanaimis, looking out over the water, saw the tops of three sticks against the horizon. As the chiefs and their people stood watching, the sticks grew bigger and bigger and rose out of the water. At first people thought that a new island was appearing, but the objects seemed to be moving, coming closer to the shore.

"It is some kind of canoe, a big canoe with white wings," said Chief Maquinna. "See! It is going quickly and making great waves."

"Lightning-snake must be moving it," someone said. "It is moving so fast that Lightning-snake must be pushing it under the water."

As the boat came nearer, all the men and women on the shore grew very much afraid. Some of them thought that it was magic. Others thought that it was a salmon that had been changed by magic into a strange canoe.

But the two chiefs said, "It is the work of Quaots, the Great Power. Quaots is sending it to us."

There were, of course, similar "floating islands" under the command of other captains.

From W.N. Gunson, "Cover's Notes on the Tahitians, 1802," Journal of Pacific History 15:4, October 1980,

When Captain Wallis approached the island in the Dolphin, the natives say that they were struck with astonishment at so extraordinary an appearance, and various were their conjectures respecting it; some supposed that it was a FLOATING ISLAND; this opinion seemed to prevail, and was strengthened by a tradition they have among them, that Otaheite Eete, the smallest part of the island, was formally driven from its situation in some distant part of the sea, by a tremendous gale of wind, and striking against the east end of Otaheite Arahye, caused a violent concussion, and then coalesced with it.

"The Coming of the White Man Revealed: Dream of the White Robe and FLOATING ISLAND," American Antiquarian and Oriental Journal, May 1890, by Silas Rand, is a Micmac tale from northeastern Canada related by Josiah Jeremy in 1869.

When there were no people in this country but Indians, and before they knew of any others, a young woman had a singular dream. She dreamed that a small island came floating in towards the land, with tall trees on it and living beings, and amongst others a young man dressed in rabbit-skin garments.

Lawrence Thornton, in his review of William Vollmann's Fathers and Crows (1992), New York Times, September 6, 1992, provides another version.

The advent of the French is heralded by Born Swimming, a Micmac woman who dreams of a FLOATING ISLAND with dead, leafless trees beneath which "fat, pale bears were crawling." When the dream bleeds into reality and the bears turn into Frenchmen coming ashore, she exults in her power: "I brought the Iron People!" she thinks, unaware that these strangers also bring destruction and disease. Born Swimming's dream and its actualization are prophetic; the French invasion of the Indians' spiritual world forecasts destruction.

Robin Fisher transcribes a tale from the Squamish Tribe of Washington in From Maps to Metaphors: The Pacific World of George Vancouver (2011),

As my elders tell the story, early one morning in the month called Tim-kwis-Kwas "hot time," an old man living near the mouth of the Squamish River had gone down to wash. As he raised his head, he saw 'island' where no island had been before. The old man was alarmed and ran back to his house to wake his relatives.

"There is an island in the sound -- a FLOATING ISLAND," he told them. The old man knew it was an island for it had skeletons of trees thrusting skyward. But it was not like an island he had ever seen. Word was sent up the Squamish River for the people to come and see the mysterious FLOATING ISLAND.

It was decided that the men would go out in their canoes to see the island. As they grew near, they saw that it wasn't a FLOATING ISLAND at all, but a very large canoe, a strange canoe. Soon, men appeared and walked around the canoe. But what strange men they were! Every part of their body was covered except for their faces, which were white. My people scrutinized them. Finally, some of the elders came up with an explanation -- these are from the land of the dead. And they are wrapped in their burial blankets!

Robert Nassau's autobiographical Crowned in Palm-Land; A Story of African Mission Life (1874) discusses the floating islands in the Benita River, now the Mbini, in Equatorial Guinea. While the physical description isn't much different than that accorded to such features around the world, the interpretation of the inhabitants' thoughts regarding the "floating islands" from afar is tragic.

Down the swift current of the Bonita, as of other rivers on the coast, are swept FLOATING ISLANDS of interlaced rushes, tangled vines, and water-lilies that, clinging to some projecting log from the marshy bank, had gathered the sand and mud of successive freshets, and gave a precarious footing for the Pandanus, whose wiry roots bound all in one compact mass. Then some flood had torn that mass away, and the Pandanus still waving its long bayonet-like leaves, convolvuli still climbing and blooming, and birds still nesting trustfully, the FLOATING ISLAND glided past native eyes down the stream, out over the bar, and on toward the horizon of broad ocean.

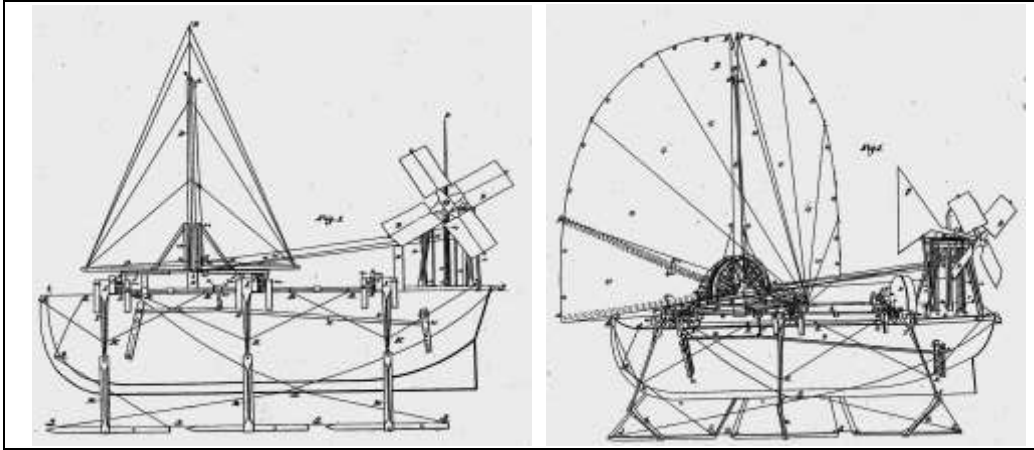
What beyond? Native superstition said that at the bottom of the "Great Sea" was White-man's Land; that thither their own departed found their happy future, exchanging a dusky skin for a white one; that there, white man's magic skill at will created the beads and cloth and endless wealth that came from that unknown land in ships, in whose masts and rigging and sails were recognized as the transformed trees and vines and leaves of those FLOATING ISLANDS.

But it not only indigenous peoples who are awed by great vessels.

"Notes and Queries, New York Steam Ferry, 1812," Pennsylvania Magazine of History and Biography 19:4, 1895.

The steam ferry boat, which moves with all the majesty of a FLOATING ISLAND is certainly the greatest masterpiece of human ingenuity that I have ever witnessed.

John Adolphus Etzler was a technological utopianist whose Description of the Naval Automaton (1841) discussed his patented method for "Navigating and Propelling Vessels by the Action of the Wind and Waves," Patent 2533 A. Waves drive what are essentially oars-in-reverse which in turn drive the ships propeller. Sails allow extra speed. The figures below illustrate the mechanism, or lack thereof, as evidenced by physical experiment.



In "A Floating Island," Mechanics Magazine, October 21, 1843, fellow utopianist C.F. Stollmeyer announced that he was implementing Etzner's technological breakthrough.

The best mode of facilitating travelling on sea is not by improving vessels as they are, and by putting certain machinery in them, but by constructing vast floating bodies, which cannot sink under any circumstances, and may be propelled by the united powers of wind, waves, and steam.

One FLOATING ISLAND would be a better means of national defense than all the men-of-war of any nation. Such an island, going at a greater speed than any man-of-war or war-steamer, could run down, and shiver to fragments any vessel built in the present style, before the gallant crew had time to fire and reload.

The floating island would be 1800 feet long and 600 feet wide. Beneath its solid bottom, 7 feet thick, diagonal timber supports 90 feet thick would form an X. Draft would be 8 to 10 feet; the central body would rise 30 feet above the surface. The plans included houses, streets, an observatory, a dining room and machinery. Power would be derived from the motion of ocean swells against three floats, which as they undulated, pulled cables and turned wheels that drove paddles. It would be fast enough to chase down any steamship.

Stollmeyer built a model of the craft, and though eye-balling the design can probably predict the result, we'll save the outcome until Chapter 76.

A similar -- even identical in places, a la "shiver to fragments any vessel built in the present style, before the gallant crew had time to fire and reload" -- report appears as "Floating Islands," in Cleaves Penny Gazette, January 6, 1844.

The great loss of human life and of property by the unscientific mode of constructing vessels (i.e. hollow bodies which split, fill with water, and are pressed down by the weight of the ballast, masts, iron machinery, etc.) ought in our time of peace and scientific improvements to induce men to seek for a remedy. This remedy is easily found if we investigate and compare the specific gravity of water and timber, and study the form of sea-fowls and other sea-going animals and if we pay proper attention to the powers of wind and waves. Nobody doubts that rafts of light timber will swim in all waters. The point therefore to ascertain is, only how to propel them; experiments which have been made with a mechanism invented by J.A. Euler, Esq. for applying the power of the waves as motive power, have also settled this question.

The mathematician Leonhard Euler wrote a number of papers on the subject of nautical engineering, his last book being De la Construction et de la Manoeuvre des Vaisseaux (1773). Euler proposed to harness the motion of waves to propel a ship by means a trough the stem, its base above the water level surrounding the ship, and its rim just below the wave crests. The trough will continuously fill with water which can be drained to power the vessel. The plan should

work in principle, but the effect would be slight and there would be difficulty in steadying the ship to make it work.

The best mode of facilitating traveling on land, was not by improvements in stage coaches, but by building railroads and locomotives; so the best mode of facilitating travelling on sea is not by improving vessels as they are and by putting certain machinery in them, but by constructing entirely different, floating bodies which cannot sink under any circumstances, and are propelled by the united powers of the wind, waves, and steam.

Replace "steam" with "solar" in the last line, and we're in the present dreamscape, as noted in Chapter 70. Concepts come cheaply; implementation does not.

A FLOATING ISLAND of 600 yards long. 200 yards wide in the center, solid bottom of seven feet thickness, side walls all-around of solid timber, the same to be put in diagonally, of 80 yards thickness at the bottom and 4 yards thickness towards the top, in the form of a swan's neck; several rows of cabins, 3 by 4 yards, 6-1/2 feet high, of three stories each 7 feet, upon a large warehouse or shiphole-like magazine, the top of which forms the under-streets (lanes), the top of the cabin, the upper streets. In the midst an observatory, dining rooms, kitchen. &c. &c. Sufficient and appropriate places for machinery for wind and waves, and steam -- stem and stern about 10 feet higher than the center of the body. The whole draft of water from 8 to 10 feet, the body out of water about 30 feet.

Such a FLOATING ISLAND would not cost more than five hundred thousand pounds. This is less than the value of English ships and goods lost during the past 9 months of this year, less than the cost of many a railroad and the capital expended upon it would at least produce five times more than if invested of the best railroad in England. But besides the advantages of transporting persons and goods in perfect safety, and with great speed, one FLOATING ISLAND would be a better means of national defense, than all the men of any nation.

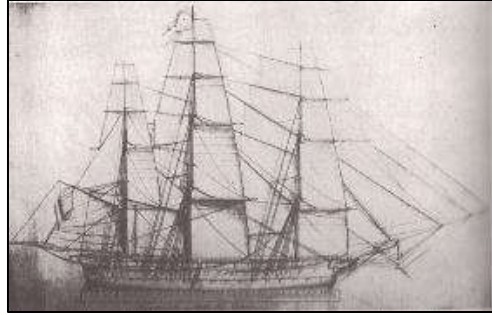
Such an island, going at a greater speed than any man of war or war steamer, could run down and shiver to fragments any vessel built in the present style, before the gallant crew had time to fire and reload.

Such a FLOATING ISLAND would be propelled, in favorable circumstances, by the united power of wind, waves and steam; in contrary winds, by the powers of steam and waves, whose powers increase in a great ratio around the FLOATING ISLAND, and within the reach of the mechanism for their application, than the power of the wind which acts upon the body out of water. In a perfect calm it would be propelled by the power of steam, generated by a new and improved method.

The smallest of vessels, as at present built, make them comparatively unfit to transport a large number of men who, by being crowded together, must fall victims to sickness, increased by the constant motion of rolling and pitching. That our present sea vessels are too small, and unfit for the purpose for which they are made, is proved by the amount of loss of life and property caused by shipwrecks. .Lloyd's Lists show that the annual loss of life is about 1,500, and of property to the value of three million sterling, around the coasts of England, Scotland and Ireland. The waste of money in building vessels in the present mode is enormous if compared with the plain had straightforward mode of constructing a FLOATING ISLAND.

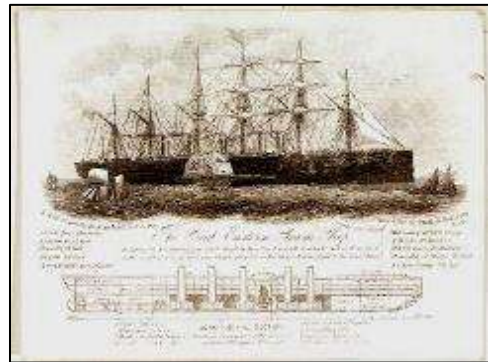
From "Foreign Intelligence," Zion's Herald, December 29, 1824.

The large ship Columbus, from Quebec, arrived at Deal on the 22nd of Oct and cast anchor near the grand ship Ramilies; notwithstanding this man-of-war is of the first class, she appears no larger than a canal boat, alongside this Leviathan of the New World. At the moment that the Columbus hove in sight, she appeared like a FLOATING ISLAND, and her masts like church steeples.



The Great Eastern imbued any number of "floating island" allusions. The Great Eastern left its print on the literary landscape. From A Signal Success: The Work and Travels of Mrs. Martha J. Coston (1886), Mrs. Coston's impression of the vessel,

I went up on deck, and found the "Great Eastern" a FLOATING ISLAND, almost hidden in flags that fluttered from stem to stern, and covered the rigging.



To be a "floating island" is not always good, however, as evidenced by many appraisals of the mega-ship. From American Railway Times December 10, 1859

They believed that they had constructed a vessel which would be able to carry fuel for a voyage however long, would attain a speed never before dreamt of and would pass over a stormy ocean with ease and steadiness which would abolish the difference between sea and land traveling, and effectively deliver the fortunate inhabitants of this FLOATING ISLAND from the inexpressible miseries of sea sickness.

According to the New York Tribune, October 2, 1861,

But the winds and the waves have weighted her, and in this also she is found wanting. Not only does she want this quality of comfort and of safety, but the helpless mass tossed in its huge proportions from billow to billow, and rolled down into the trough of the sea, dashes her helpless passengers against her iron sides to crush them, body and bones, as they fall.

She is no longer a noble ship, the last and best handiwork of man, triumph over the forces of nature, but a FLOATING ISLAND, the sport of a three days earthquake, on which men are tossed about by the restless waters helpless and hopeless, amid; the crash and wreck of a universal ruin.

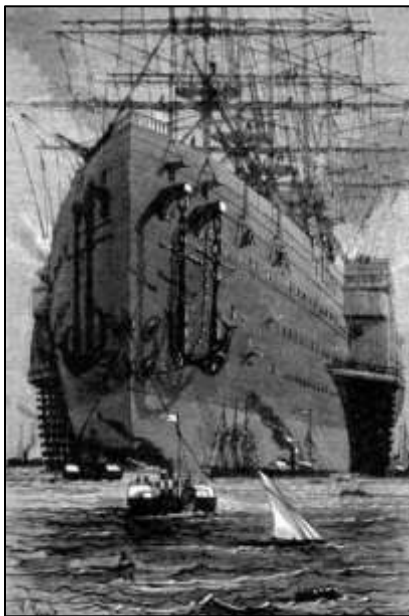
"The Great Eastern a Failure," Chicago Daily Press Tribune, November 29, 1859,

They believed that they had constructed a vessel which would be able to carry fuel for a voyage however long, would attain a speed never before dreamt of, and would dash over a stormy ocean with an ease and a steadiness which would abolish the difference between sea and land traveling, and effectually deliver the fortunate inhabitants of this FLOATING ISLAND from the inexpressible miseries of sea-sickness. Do the results entirely bear out these anticipations?

"The Navy and India," Living Age, November 21, 1857,

One of Her Majesty's frigates has touched a rock and gone down at the mouth of the Canton River; and five big transports have touched the ground in the Straits of Sunda or thereabouts, one of them to her cost. It is obvious there cannot be equal danger with vessels of less draught. Let big ships be used in their place. In the open Atlantic, the Great Eastern will be a FLOATING ISLAND, and as steady and safe as where she now stands. But happily for small people, for small capitalists, young officers without friends, and generally the rising generation, in a large part of the ocean, not to speak of the rivers, you get soundings, every now and then, at twenty, fifteen, or ten feet. There must be craft adapted to this moderate depth, and people must be found small enough to take charge of that craft.

Jules Verne's A Floating City (1871) enjoyed a popularity approaching that of Round the World in Eighty Days. A Floating City stemmed from the author's trip to America four years earlier on the Great Eastern. The text portrays a fairly-accurate picture of life onboard. The illustrations, however are exaggerated in the impressions they convey.



A Floating City (1871)



A bord de "Great Eastern," comparable a une ile flottante, nous avons parcouru Liverpool -- New York, en compagnie de milliers de passagers.

As the Great Eastern was both wind and steam driven, we've a segue to our next vessels, steamships.

Emmeline Wortley's Travels in the United States, etc. During 1849 and 1850 (1851) celebrates the Hudson steamers.

The steamers on the Hudson are perfect palaces, and fairy palaces to boot! being the most delicate and finished creations of art and fancy you can imagine; larger than the far-famed "Great Britain," and apparently lighter than the rainbowed oracle of a nautical sylph, a FLOATING ISLAND of painting, marble, gilding, stained glass, velvet hangings, satin draperies, mirrors in richly carved frames, and sculptured ornaments, with beautiful vases of flowers, Chinese lamps of various indescribable fantastic forms, arabesques, chandeliers -- in short, you might fancy yourself in Haroun Alraschid's Palace.

The Confidence-Man (1857) by Herman Melville, describing the steamer Fidele, traveling from St. Louis to New Orleans on the Mississippi,

The great ship-canal of Ving-King-Ching, in the Flowery Kingdom, seems the Mississippi in parts, where, amply flowing between low, vine-tangled banks, flat as tow-paths, it bears the huge toppling steamers, bedizened and lacquered within like imperial junks.

Pierced along its great white bulk with two tiers of small embrasure-like windows, well above the waterline, the Fidele.. might at distance have been taken by strangers for some whitewashed fort on a floating isle.

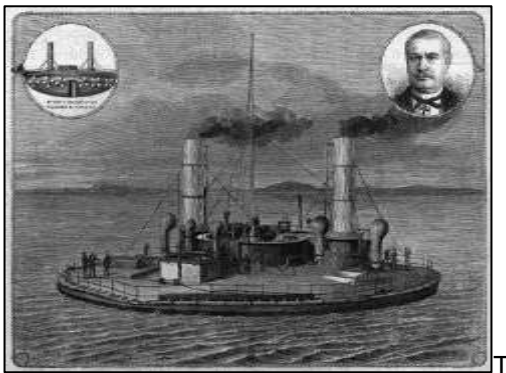
C.W. Eddy, "Some Account of American Implements and Economic Contrivances," Journal of the Society For Arts 9:437, April 5, 1861,

Shipment of grain. How is this, performed? Why, 20 or more of the barges, each of which is a boat of 70 tons capacity, are formed into a raft, with a steam propeller in the middle, and the whole mass, like a floating island, undertakes its adventurous voyage to New York. This appears a dangerous enterprise, but I believe accidents are of rare occurrence. One passes a large number of these FLOATING ISLANDS in steaming up the Hudson. The entire expense of conveying a bushel that whole distance thus, is only 7d.

"A Queer Craft for the Czar," London Telegraph, October. 22, 1879, and queer it was.

His Majesty the Czar has ordered the construction at Glasgow of one of the most curious vessel ever built. It is a pleasure yacht of some 7,000 tons burden, to be made of steel and to be driven by three bronze screws. The lower portion of this experimental craft will be shaped like a huge flat fish, being almost as broad as it is long with sharp sides and a pointed head and tall. The imperial yacht will be exactly like a. brill, in fact, as regards contour and dimensions.

The circular Popoffkas -- though failures as men-of-war -- have always proved remarkably steady in a seaway, and this prodigious flat fish of steel ought to ride almost as placidly as FLOATING ISLAND, were it not for that "scend" of the ocean which no vessel, however big, has ever yet conquered.



The Popoffka, to which the Telegraph refers, was a class of Russian circular iron-clad warships. The arms race of the latter 1800s brought innovations to the art of Naval warfare, this not being one.



The craft for the Tsar, the Lavadia, shown in construction, was 259 feet long and 153 feet wide and proved to be prone to wave damage.

"King Coal's Highway," Harper's, January 1882,

The coming of night multiplies the pilot's difficulties, and usually, unless water and weather are extremely favorable, the FLOATING ISLAND of coal, wood and vibrating machinery must "tie up." This noble river is fraught with danger. The FLOATING ISLAND of fuel and boats seems

suspended in mid-ocean, with only clouds of whirling vapor for companionship, and nothing to recall save the flash of unseen water

R.E Welsh, "Gibbon's Five Causes of the Victories of Christianity," United Presbyterian Magazine, November 1884,

You may, if you choose, say that the ocean steamship is driven through the waters by the screw -- by what is called "the propeller." But if you are to explain the motion and name its source you must go to the engine room, with which the propeller is connected by rod. There you will find that it is the mighty power of steam which drives the FLOATING ISLAND.

"Some Account of American Implements and Economic Contrivances," Journal of the Society of Arts, 9:437, April 5, 1861, by C.O.W. Eddy, regarding the transport of grain,

There again it is transshipped, or it goes on through the Welland Canal and Lake Ontario, 150 miles farther, to be transshipped at Oswego into the barges of the Great Erie Canal to Albany on the Hudson, whence it has to descend the river a distance of 150 miles, the lower part of which is a broad estuary several miles in width.

How is this performed?

Why, 20 or more of the barges, each of which is a boat of 70 tons capacity, are formed into a raft, with a steam propeller in the middle, and the whole mass, like a FLOATING ISLAND, undertakes its adventurous voyage to New York. This appears a dangerous enterprise, but I believe accidents are of rare occurrence. One passes a large number of these FLOATING ISLANDS in steaming up the Hudson.

Before we get to mega-vessels actually built, we'll note the anonymously-written Mr. Ghim's Dream (1878), in which a poor young idealist raises \$100 million from America's leading financiers to build the Toto, a steam-driven vessel, 1800 feet in length and 900 feet in breadth. Some descriptive passages:

Let us conceive the thing whereon the future man will traverse every ocean. And, for the convenience of a name, let us call the mighty structure a TOTO.

The Toto is very nearly level, and might be called a gigantic raft. But a raft is a crude affair, and this is not... It is a ferry-boat worthy of its line!

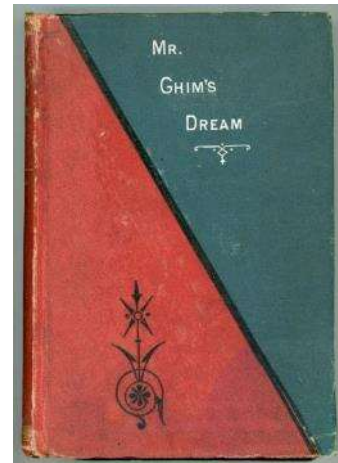
We find that very little iron is used in the construction of the Toto. There is some, but not a great deal... The principal material is much lighter, yet very tough and durable. It is a substance which for a long time was manufactured only in sheets, forming an article remarkably strong for its thickness, and called paper.

The hold is reached through capacious openings in the courtyard of each block, the street pavements being left unbroken for travel.

The Toto is guided, easily guided, yielding readily to the touch of one man, for his arm is aided by a mechanical appliance a thousand arms strong.

All of the houses (except the lofty pilothouse) are of a uniform height; the flat roofs are alike; and thus each square is fitly topped off with a promenade-deck. Here are chairs for those who wish to sit; here is space for those who wish to walk; and here is a railing around.

We steadily advance, emerging from the lower bay, and moving out so quietly upon that rolling prairie of water that we seem to be borne along on a FLOATING ISLAND.



Steam is adequate to the propulsion of any bulk through the readily yielding fluid water. When the Toto is ready to start, we will brighten up those jolly fires below, wake up the screw propellers to a lively sense of duty, get up a revolution among them, and travel by the method of propulsion now in vogue..

If the Toto should by accident become unmanageable, and be carried astray, the monster could not be demolished by anything it met. Of course the Toto is built in water-tight sections, that a leak in any part would not engulf the whole.

No billow could lift it, no wave could sink it; no iceberg could crush it. The monster would steadily drift, and, wherever it might float, there is not a rock that could destroy it. The Toto would drift until it touched, and there it would stay until its constitutional disabilities were removed, when its course could be directed elsewhere.

Behold that gracefully sweeping line of houses on the Toto, facing its outer street, extending around the diminutive city, three-quarters of a mile, a curvilinear row of the best hotels and private dwellings. All fronting directly upon the ocean, all possess a location which is superb.

A majority of the people on the Toto are passengers, but there are persons who have lavished money on apartments for the summer. And there are others so charmed with a life on the ocean wave in a masculine ship, they enjoy its delights the year round.

Now is the time for the largest enterprises to be inaugurated, for the means of carrying them forward are now most painfully yearning to be used. They have built many cities, large and small; they can certainly build another. Just now they have nothing else to do, and ache to build the floating little city, the Toto.

Seasickness is unknown on board this vessel."

The Toto, spreading over quite a number of waves, will not be lifted by any one, but must meet the full force of every coming billow... But it is only the rim which will necessarily be so extremely stout, for the water, after expending its force there, and being overcome, will smoothly slide along beneath the level bottom of the FLOATING ISLAND.

Each great wave touched the curved outline at one point first, and all other points afterward. Thus every encounter was gradual. At all times there were several billows rolling past the Toto. Its steadiness was perfect.

And now for the implementation. "The Modern Iron Vessel: Sir Nathaniel Barnaby Discusses Its Merits," New York Times, October 10, 1890,

Sir Nathaniel says that some years ago a well-known American capitalist consulted him as to the possibility of building a steamship which would roll at pitch or heave in the sea, and in which, therefore, the majority of the passengers would be in a less desperate hurry to get ashore. Speed was not essential. Fifteen knots an hour would do.

Sir Nathaniel said that the idea appeared to him to be perfectly practicable with a draught of water of twenty-six feet. He thought the minimum length and breadth would be 1,000 feet long and 300 feet broad. To get fifteen knots an hour out of such a FLOATING ISLAND as this was in his opinion that the engines would have to run on 60,000 horsepower.

Two sets of apparent difficulties had to be overcome, viz., those connected with building the ship afloat, and those relating to receiving and discharging cargo. The ship would be a steam island, incapable of entering any docks.

"Floating Steam-Propelled Islands of Steel," Scientific American, October 18, 1890,

A FLOATING ISLAND made of steel, 1,000 feet long, 800 feet wide and drawing 26 feet of water -- such is the type of ship as described by Sir Nathaniel Barnaby, constructor for the British Navy, at the recent sitting in Pittsburg, Pa., of the Iron and Steel Institute of Great Britain. With engines of 60,000 h.p. such a craft, he said, ought to make 15 knots an hour -- a speed,

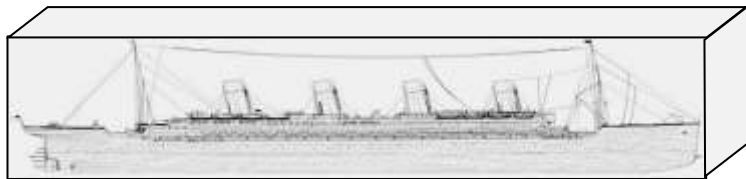
we will add, which, though only three-fourths of that now logged under favorable conditions by quick ships, would be quite fast enough for most ocean travelers if the promise of steadiness under all conditions of weather went with it.

Constructor Barnaby would load and unload his ship in midstream by lighters, and, instead of breaking their bulk, would take them aboard, hull and cargo, for his plan includes a clear sheet of water for them 'tween decks, a miniature harbor into which they may be floated at one port and floated off again at another. Once the lighter fleet containing the ship's cargo is properly arranged aboard, the boating basin can be pumped dry and all comfortably stowed for the voyage -- the sea being let in again after the ocean has been crossed, and the cargo thus distributed in many bottoms floated ashore. The later plan is to keep lighters and steam tugs permanently floating aboard.

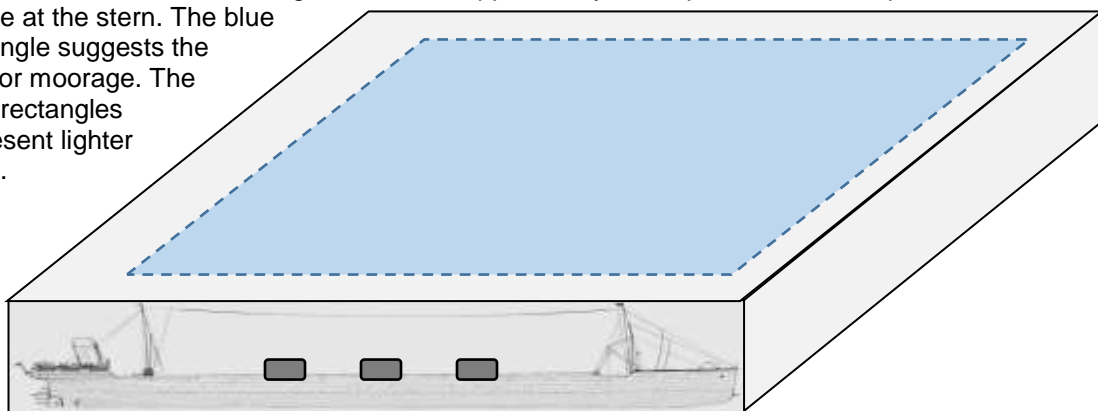
The present delays in showing cargo and breaking out would be obviated, for, if a duplicate set of lighters were in use, the various sections of an outward cargo could be prepared before the ship was arrived. But far more important would be the saving of expense and convenience of distribution, once the ship was in and the various sections of her cargo broken out and floated into the stream; the lighters containing freight being dispatched to various parts of the shore line directly to the railway termini, thus saving always one and sometimes two handlings.

It may appear to those who have observed the effect of liquid in a moving basin that the commotion of the liquid in this floating harbor would tend to unsteady the ship. While this is quite true where the weight of the water approaches that of the basin, the reverse is the case where the fluid is but a fraction of the weight of the vessel containing it. For, as the constructor points out, "when a loose weight is moved about violently by the rolling or pitching of a ship, the tendency is to bring the ship to rest."

The Titanic, 883 feet long, 94 feet wide, 34-foot draught, 30,000 horsepower



For visual comparison, we've rescaled the Titanic profile to the dimensions of the proposed vessel, 1000 feet long, 800 feet wide, 25-foot draught, 60,000 horsepower. To make our reconstruction resemble a freighter, we've stripped away the superstructure and placed the bridge at the stern. The blue rectangle suggests the interior moorage. The dark rectangles represent lighter ports.



Today's largest ship is the Shell Prelude, a liquefied natural gas floating facility, 1600 feet long and 240 feet wide, that will rarely move. The USS Enterprise is 1120 feet long and 130 feet wide at the waterline, 260 at the deck. The Queen Mary is 1130 feet long and 140 feet wide at the waterline

"Stormy Weather Fails to Dim the Brilliancy of the Great Pageant," New York Evening Telegram, April 27, 1893

From around in the East River, from all along New York's river front, from Stanton Island, from Communipaw, from Jersey City, from Hoboken and up the Hudson the boats came in singly at first and then by twos and threes until by tea o'clock the whole liver looked like one vast FLOATING ISLAND.

A. Fleury, Picturesque Chicago 6:6, September 1900

The European is also struck with the strange sight of the lake vessels, with their great roofs piled one above the other. The usual height of the sides above water, the captain's cabin built like a miniature house, all constitute a veritable FLOATING ISLAND, slowly and gravely passing down the narrow river.



Random Issues, March 6, 1903

The biggest ship ever constructed, the Cedric, arrived in New York Friday, on her initial trip across the Atlantic. Her officers and her passengers say of her. The ship was as steady as a FLOATING ISLAND. You would never know that you were on a ship. It was like a seaside hotel, even when there was a gale blowing outside.



"Beauties by Searchlight. How Progress of Civilization It Manifested Along the Hudson," Mount Vernon Daily Argus, August 15, 1904.

In all the river towns the passage of the boat is followed with close interest, and each boat is known and recognized in every village... As a boat moves majestically along the great stream, a FLOATING ISLAND of light, playing her long beam of light over the hills, she is a wonderful spectacle.



"The Queen Coming to America," Chicago Daily Press Tribune, September 24, 1858, concerning a Royal visit to Canada on the royal yacht *Victoria and Albert*

The great ship, it is said, would move along like a FLOATING ISLAND, unaffected by the loftiest waves of the most tempestuous sea. The people of England would not grudge the expense, and the House of Commons would readily pass the necessary vote.



"Lady Rhondda's Amazing Escape from Death. The Distinguished Viscountess Describes for the First Time Her Thrilling Battle for Life in the Cold, Death-Filled Waters" Philadelphia Inquirer, July 29, 1923 , speaks not of the Lusitania as a floating island, but rather its wreckage.

When I came to the surface I found that. I formed part of a large, round, FLOATING ISLAND composed of people and debris of all sorts, so close together that at first there was not very much waiter noticeable in between. People, boats, hencoops, chairs, rafts, boards, and goodness knows what besides, all floating.

The Titanic -- floating island meets floating island -- is discussed in Chapter 47.

"Pier Throngs Seem Pigmies From. Deck. Normandie So Gigantic That Ten-Foot Waves Are Mere Ripples to Passengers High Above Water's Edge," Brooklyn Daily Eagle, June 4, 1935,

Walking about this 79,280-ton FLOATING ISLAND, the traveler finds her so huge that it is a tired citizen indeed, who returns to his cabin after a day of visiting her lounges, swimming pools, dining rooms, bars and sport decks.



"Watchman is Forgotten on Rotting Vessel," Southern Cayuga Tribune, January 1, 1932, equates a derelict ship to a floating island not because it's big, but because it becomes part of the harborscape..

Barefooted, in garments crudely made from rotten sailcloth and fish lines, with staring eyes In a leathery, expressionless face, a new Robinson Crusoe was recently led through the streets of Brest,

What a story he could have told had at one been alert enough to get it before he was shipped off to Greece. A Robinson Crusoe, yet never out of sight of land, with constantly passing ships, with a great seaport in view, and himself under the eyes of thousands.

Like many stories, this one began with the war. When the farms were replowed, and wooden crosses were replaced with marble, there remained in the roadstead of Brest a FLOATING ISLAND. It was made of scores of those wooden ships built in frenzy when anything that would float was beyond price.

The wooden ships rotted for years and finally were sold and scattered over the world.

Only one remained at anchor, far out in the vast harbor. It became a part of the harbor, like the lighthouses and the block rocks of the rugged Brittany coast. People forgot to wonder about it.

It had been bought by a Greek company. The company had sent up an old fisherman from the Aegean Sea to live on board, to be its captain, crew, and, especially, its watchman.

They told him it would be only a few weeks and then a crew would come to take the ship away. His salary came in the mail. Once a week he rowed ashore to buy provisions. Speaking no language but Greek, he had to buy in sign language; but his wants were simple, and it was easy to satisfy them.

Then the Greek company failed -- forgot its ship, forgot its watchman. The poor fellow heard no news -- received no pay.

He could explain his troubles to nobody in Brest. Greece had no consul there, and the watchman had no money to go elsewhere. He never had learned to write. He waited for the crew that never came. For him the simplest solution was to live where he was. The one thing he knew well how to do was to fish.

Nobody knows exactly how long he lived on fish. Day after day, week after week, month after month, and so into years, the exile lived alone on his wooden boat, watching the world pass, but receiving no news from it, his only companions a few ship's rats leading an existence as meager as his own.

Gradually his clothes fell from him. When there was no more mending them he made rough garments from old sail cloth he found on board.

So it would have gone until the wooden hulk sank from old age had not a curious harbor navigator decided to board the lonely ship that never sailed. He found there a being as completely separated from humanity as if he had been marooned on the original Crusoe's Isle - who had forgotten how to speak even the language to which he was born.

By way of the harbor authorities a report was made eventually to the Greek consul in Paris, and one day a messenger in smart boulevard attire arrived at Brest. He was motorboated out to the anchored ship. He brought ashore the exile, long haired, silent, ragged, barefooted, and frightened, bought him some store clothes, and took him away.

Back in Greece somewhere the old man is telling a story with a new found tongue.

"In Giant Ships, Man Reveals His Genius," New York Times, June 2, 1935, returns us to the maga-vessels.

The liner becomes a miniature kingdom, for, though a passenger may sail the seas for years with no sense of restraint, he is actually under a despot whose word is the law of the FLOATING ISLAND. The captain is king.

"Adventure on the QE2: Marooned at Sea -- but the Elegance, and the Fun, Never Stopped," Washington Post, February 10, 1985,

Ah, but once there was high adventure, too, in an ocean crossing, and on this particular trip the QE2 managed to provide a modern-day version, something not even the captain had expected. In mid-voyage, our ship stopped, dead, in the middle of the sea, and stayed there unpowered for the next 36 hours. We were marooned hundreds of miles from land, captives aboard a FLOATING ISLAND. But a marvelously luxurious and well-provisioned island, so who minded the captivity?



"Hawaii," Cruise Travel, April 1981

The Oceanic Independence's new owners call her "Hawaii's FLOATING ISLANDS,"



Cruise Critic Review,

Curious about Oasis of the Seas, the 225,282-ton, 5,400-passenger FLOATING ISLAND set to debut this December.



"From Desert to Cruise Ship: Coachella Heads to Sea," New York Times, July 17, 2012,

And on a FLOATING ISLAND, of course, the late-night revels can continue without fans worrying about a midnight drive through the desert to their hotel rooms.



"The FLOATING ISLAND. Welcome To The Neighborhood On Royal Caribbean's Monstrous Voyager Of The Seas," Chicago Tribune, January 23, 2000

The 142,000-ton vessel -- with 3,264-passengers on this sailing -- looks like a ship and feels like a ship. But, really, it's a FLOATING ISLAND. Say, Manhattan Island.

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Moving into what may lie ahead, "Floating Tax Haven for the Rich; The Idea Sails Again," NBC News, December 2, 2013

The idea of a FLOATING ISLAND for the rich seems to bubble up every year or so.

The "Freedom Ship International," a one-mile long, 25-story tall behemoth, pictured in the artist's rendering above, is out looking for funding. The Freedom Ship could house 50,000 to 80,000 people and would have its own casino, hotel, shopping malls and apartments.



The ship would look for a favorable registering country, probably not the U.S. It would never actually dock in any country and would circumnavigate the globe every two years powered by solar and wave energy.

There's grown-up fiction and juvenile fiction. Sometimes it's difficult to distinguish. Professor Terwilliger and Tim Neptune (2004) by Cal Patterson,

Freedom Ship had to be seen to be believed. More FLOATING ISLAND than ship, it rose 25 stories high. Capped by a busy airport, commuter jets and helicopters could be seen leaving and arriving. Tenders could be seen entering the marina at the stern. As Neptune I approached, the view was awesome.

Warships

We of course can't leave out the floating islands of menace.

From Naval Evolutions (1762) by Paul Hoste and Christopher O'Bryen,

After the ships of war, the largest ship is called a galleasse, which is a kind of ship of one deck, and three masts... They have thirty-two banks of oars, with six or seven slaves to an oar... Their complement of men consist of a thousand, or twelve hundred. To see one of these galleasses at sea, she appears like a great FLOATING ISLAND, able in appearance to encounter with twenty galleons.

"The New Russian Yacht," Engineering, October 24, 1879, provides detail on the concept behind the earlier-mentioned Tsar's vessel.

"A floating fighting island" is the form she appears in to a contemporary, who drawing upon an active imagination describes her as presenting no side to the sea, her upper deck will be flatly curved, rising from the water's edge to the middle like the upper shell of a tortoise. She will in a word resemble a FLOATING ISLAND, up whose sloping beach the waves will wash, rather than a ship!

She can proceed leisurely to any destination, and deal death and destruction around, while remaining herself practically uninjured. If used for the purposes of coast defense, she might take up a position, let us suppose, in the Bosphorus or Dardanelles.

Arrangements are to be made for letting water into the forward end of the ship where the draught of water is only 6 ft., so as to tilt her up, and thus lift the stern. In this way she will be able to cross the shallows at the mouth of the Dnieper on the way to Nicolaieff.

"Flames Encircle Shanghai as Shells Rain; Japanese Open Big Drive," Brooklyn Daily Eagle, August 17, 1937, is a prelude to World War II.

When the Dollar Line tender returned late today from Woosung, sailors and United States Marine guards who accompanied the refugees brought word they had been put safely aboard

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the Jefferson. They told of women weeping with joy and relief to find themselves safe aboard the ship, a FLOATING ISLAND of refuge from booming guns, with nurseries and food for their children.

"Hoover to Make First Call at Amapala Today," Philadelphia Inquirer, November 26, 1928, on the USS Maryland,

It was an impressive sight, colorful, solemn, vivid and unforgettable. Here was a FLOATING ISLAND of steel hemmed in by water and sky, illumined by the blazing sun.

"Another 'FLOATING ISLAND' Joins British Fleet in Mediterranean." Medicine Hat News, October 10, 1935,

Here is a picture of the HMD Queen Elizabeth which recently arrived in the Mediterranean Sea to join the mighty array of British battleships in the "danger" zone. The Queen Elizabeth has had her deck strengthened to resist aerial attacks and her sides changed to withstand submarine warfare.



"Giant Aircraft Carrier 'FLOATING ISLAND' Base," Cortland Standard, July 7, 1948, on the USS United States, never completed, but to re-emerge as the USS Forrestal,

The Navy's new 65,000-ton carrier, authorized in the closing hours of Congress, will give the United States a "FLOATING ISLAND" base from which devastating attacks

"Pilots, Man Your Planes. FLOATING ISLAND," Brooklyn Daily Eagle, September 21, 1952, however, indicates that for the USS Antietam, the "island" is the above-deck superstructure, not the vessel in its massive entirety.

The huge compartmented structure on the flight deck is the "island." A signal flag is flown at the yardarm when the command to "Launch Aircraft" is given.

"Incidents," Utica Daily Press, December 23, 1954,

Here is the U.S. Navy building a FLOATING ISLAND called the USS Forrestal -- an aircraft carrier of such dimensions that it cannot pass through the Panama Canal.

"Arms in the Atomic Age: A New Navy Emerges," Christian Science Monitor, May 24, 1957,

Ever see a FLOATING ISLAND? This writer rode one for several days 200 miles off the coast of Virginia. It was the USS Randolph, a great, responsive hunk of metal called an aircraft carrier -- a floating airport, a floating city. Standing with Capt. Daniel Smith on the bridge of the Randolph, you can have nothing but admiration for the men of the Navy who know and control their massive ship as you do your Ford or your Buick.

"Missile-Tracker Is Joining Fleet: The Gen. Arnold Held Most Sophisticated Vessel," New York Times, April 12, 1963,

Missile-tracking requires a precise knowledge of the tracking station's position. Aboard the General Arnold, which will be in effect a FLOATING ISLAND, this knowledge comes from a self-contained navigation system that reveals both location and the ship's attitude. It is similar, Sperry officials said, to the system used in Polaris submarines.

"Armed Forces Fight 'Our' Wars Overseas," Virginia Beach Sun, February 22, 1968

The Enterprise is not only the world's largest warship but also the world's fastest. The feats and capabilities of this huge FLOATING ISLAND are well known to the enemy. Russia has announced plans for the building of aircraft carriers. So has Red China, but theirs is a catch-up game.

"Day and Night on the Ike," Christian Science Monitor, August 31, 1989, "Ike" being the ,USS Eisenhower,

But alter you leave, and watch this FLOATING ISLAND of steel drift away toward the horizon, you realize that it exists for one reason above all others: so that people in other parts of the world will pay attention when George Bush speaks.

Other Vessels

Funded by the Navy, the open-sea Floating Instrument Platform FLIP was constructed in the earlu 1960s utilizing deep draft to minimize the effects of wind and water.



FLIP is essentially a slender 355-foot tubular hull, 20 feet in diameter for almost half its length, tapering to a 12-foot cylinder at the bow, Towed horizontally to its station, flooding the tanks causes the bow to rise and the stern to drop until the vessel floats vertically. The 700-ton platform, with many improvements, remains operational today. The ship has such specially designed interior features as a toilet seat that can flip 90 degrees.

Less exotic, but as noted in "Barges Move Slowly, But Low Operating Costs Promise Bright Future," Niagara Falls Gazette, March 6, 1970, barge "floating islands" remain very much in use.

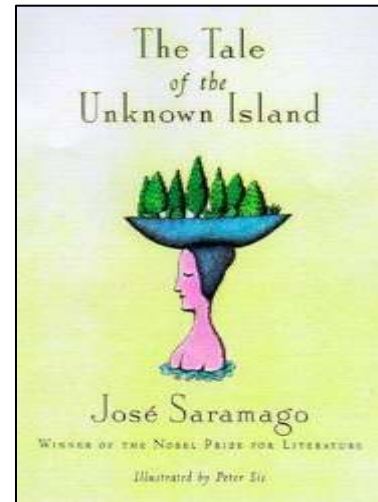
Powerful boats have been developed that are able to push 48 barges lashed three abreast in a FLOATING ISLAND one-third of a mile long. Their carrying capacity of 80,000 tons is equivalent to that of 10 freight trains of 50 cars each.

We didn't say "functioning ship." The Homebush Bay floating forest in Sydney, Australia is the result of 40 years of mangrove growth on the abandoned SS Ayrfield, built as a collier in 1911.

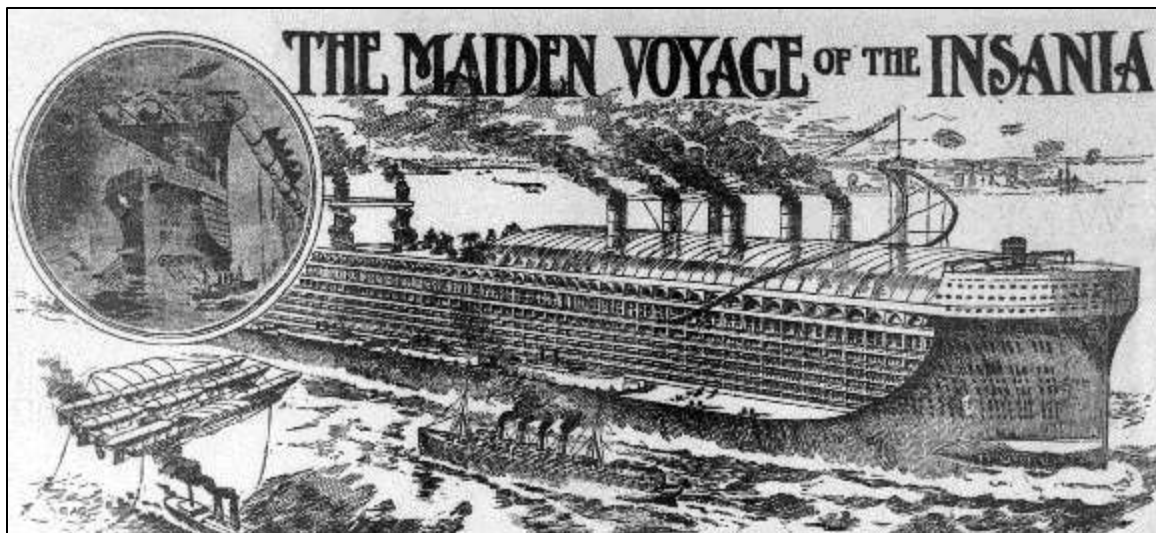


And in the same category Jose Saramago's The Tale of the Unknown Island (1999), in which an exploring vessel, after being abandoned by the crew as unseaworthy, itself turns out to be the very island that they had sought.

In the rush to leave... the sacks of earth had split and spilled open, so that the whole deck had become a field, dug and sown,... roots from the trees ... penetrating the frame of the ship itself... a forest that sails and bobs upon the waves.... Birds have begun to sing, ... emerg[ing] into the light perhaps because the wheat field is ripening and needs harvesting.... With the tide, the Unknown Island finally set to sea, in search of itself.



"The Maiden Voyage of the Insania," San Francisco Call, November 3, 1907, is a bit less serious.



There is also the fire department/ with its automatic fire detector and large force constantly in readiness; the central garage, where all the motorcars are stored, whether of the ship's own service or of passengers' private use. The telephone central is here also, and across the shaft

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from it the police headquarters, with its detective bureau as well as its squads of ordinary policemen. The hospital, with its private rooms and wards, the operating room, the quarters for the trained nurses and offices for the doctors is conveniently located on this floor.

No doubt this all sounds like the ravings of a lunatic, but it is not one percent as absurd as the liners preceding the building of the *Insania* would have seemed when Robert Fulton, in 1807 sailed the wheezing little *Clermont* up the Hudson to the amazement of the housewives, who saw the same forces that lifted the lids of their tea kettles propel a ship over water. Mother Shipton several centuries ago prophesied that "ships like iron horses would ride over the seas" and the iron ship of today is so old that most of us do not remember the time when the first one was floated.

Dean Swift sent Gulliver on his travels to an imaginary floating island called Laputa. People said that it was a clever fancy in the eighteenth century; in the twentieth the sister ship of the *Insania* will be named the *Laputa*.

For those who cared about Liz and Richard, "Movies: Was It Like This With Louis XIV?" New York Times, October 15, 1967

Art Imitates life and life art. The Burtons' 110-foot motor yacht Kalizma, their FLOATING ISLAND of privacy, sits alone in the bay below an isolated hotel on a promontory 20 miles from the nearest town.



We'll end our ships-as-floating-islands illustrations with one most severe, from "William Wilberforce," Harper's, April 1872, by A.R. Macdonough.

The merchants had in vain painted the hold of a slaver as a scene of delights, fragrant with frankincense, and echoing with happy songs, a FLOATING ISLAND of the Hesperides, bearing its freight of grateful Africans out of barbarism to refinement and Christianity.

Ships Disguised as Islands

Warcraft have long been disguised as floating islands, some draped that way for surprise attack, others so garbed to expedite retreat.

From *Os Lusíades* (1572), a Portuguese epic poem about the discovery of India written by Luis de Camoens. (1877)

*Before the fleet, to catch the heroes' view,
The floating isle fair Acidalia drew.
Soon as the floating verdure caught their sight,
She fix'd, unmov'd, the island of delight.*

A note from W.J. Mickle's 1877 translation,

As the departure of Gama from India was abrupt, he put into one of the beautiful islands of Anohediva for fresh water. "While he was here careening his ships," says Faria, "a pirate named Timoja, attacked him with eight small vessels, so linked together and covered with boughs, that they formed the appearance of a floating island."

The Paraguayan War was fought from 1864 to 1870 between Paraguay and the alliance of Argentina, Brazil, and Uruguay. From A History of South America, 1854-1904 (1904) by Charles Akers,

For Lopez, the situation was now gloomy enough, but the Dictator of Paraguay was full of resources, and forthwith conceived a plan for the destruction of the portion of the allied fleet, lying below Humaita. In the rivers Paraguay and Parana, masses of verdure float with the current.

Those camalotes, or floating islands, usually excite little attention, and Lopez formed the idea of lashing canoes in batches of four and covering them with similar herbage. By embarking armed men in these canoes and floating them down the river amongst the allied fleet, they might be able, when they reached the vessels, to board the ships and kill everybody offering resistance. On the night of March 1, 1868, this extraordinary plan was put into execution, and at break of day the first of these batches of canoes was abreast of the cruiser Lima when a guard boat stationed a hundred yards off became suspicious and gave the alarm. The Paraguayans nevertheless boarded the Lima and killed a number of the men on deck, but the crew rallied after the first onslaught, and regained possession of the vessel. The other ships of the fleet, now on the alert, opened fire on the camalotes as they drilled along, and few of the 1000 men in the canoes escaped death.

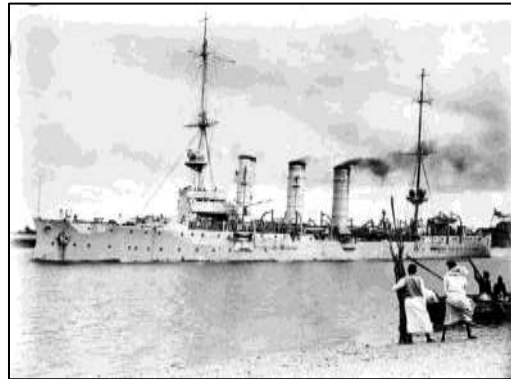
Soon after this abortive attempt against the allied fleet, the weak points of the Paraguayan defense became more apparent. The remaining positions in the "Lines of Rojas" were captured by General Argollo, and all resistance in this district ceased. A few days later Curupaiti capitulated. This allowed a closer investment of Humaita and the allies advanced their entrenched positions from the south, but this entailed severe fighting with the Paraguayan outposts and 200 officers and men were killed and wounded

"The Koenigsberg Was Disguised as 'Floating Island.' Aeroplane Scouts Gave Tip to Others," New York Herald, July 3, 1916, comes from World War I.

Mr. Cotter said that the cruiser Koenigsberg, which had sunk the Pegasus off the Coast of Zanzibar, was sunk while going up one of the big African rivers disguised as "a floating island."

"She had palm trees on her deck and other large plants of the torrid zone," he said, "and if it had not been for the British aeroplanes she probably would have got by in that disguise. As it was, she was assailed both from land and from the aeroplanes and quickly destroyed."

The Konigsberg at Dar es Salaam, 1915



"Last Dutch Warship Escapes," New York Times, April 12, 1942, brings us to World War II.

The last Netherland warship to leave Surabaya has arrived safely in an Australia port and her commander declared today that the big Java Naval base had been blasted to bits before it was abandoned to the Japanese.

To escape detection on the voyage to Australia, the Dutch vessel was decked out with foliage by her crew of fifty-nine until she resembled a veritable floating island.

To the right, the Dutch minesweeper Abraham Cruijnsen disguised as a tropical island



"Floating Island." Newsweek; March 8 1965, moves us to the Viet Nam conflict.

On a routine helicopter mission over Central Vietnam's rugged Cap Varela, U.S. Army Second Lt. James S. Bowers found himself doing a double take. Down below him was an oddly shaped little island like many along the coast. But this one was moving. Whirling down for a closer look, Bowers discovered that the "island" was a coastal freighter thickly camouflaged with potted trees. A radio check with the nearest naval station confirmed that no friendly vessels were navigating in the area. And when South Vietnamese fighter bombers sent to reconnoiter the ship met with mighty machine-gun fire from the nearby hills, they promptly sank the vessel in the offshore shallows.

An Island Resembling a Ship



Monemvasia, Greece and Chemical tanker

Islands Created as Boats

The most striking geographical feature of Botswana's Ngamiland is its nearly 17,000-square-kilometer Okavango Delta. Some 7,800 kilometers are flooded annually and covered with

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hundreds of square kilometers of such shallow-rooted wetland plants as *Echinochloa scabra*, *Ipomea aquatica*, *Pycreus nitidus* and *Vossia cuspidata*.

Our particular interest not in the natural features, however, but in the human adaptations, in particular the employment of what's available to construct rafts. Charles Andersson, Lake Ngami, or Explorations and Discovery during Four Years Wanderings in the Wilds of South-Western Africa (1856) describes a raft made of palmyra reeds

This primitive raft, which is in general use among the Bajeye, either for hunting purposes or for descending the Teoge and other rivers, is exceedingly simple in its construction. All one has to do is to cut the reeds (the different species of palmyra, from their buoyancy, are peculiarly well adapted to the purpose) just above the surface of the water, and to throw them in layers, crosswise, until the heap is of sufficient size to support the party.

No binding of any kind is requisite; but fresh layers of reeds must occasionally be added to the raft, as, from the constant pressure at the top, the reeds get soaked, and the air contained in them displaced by water. A stout pole is placed upright in the center of the mass, to which is attached a strong and long rope. When the voyagers wish to land, this rope is taken ashore by one of the men in the canoe that is always in tow or on board the raft, and secured to a tree or other firm object.



No efforts were made to steer or propel the raft, which was left entirely to the stream. As soon as we were caught by some projecting reed-bed -- and this was of frequent occurrence -- the raft immediately swung round and thus disengaged itself.

A.G. Stigand, in "Ngamiland," Geographical Journal 62:6 (1923) notes the same.

The writer has seen flotsam of papyrus rafts which are little floating islands some 15 to 17 feet diameter by some 5 feet deep in thickness, constructed and used by Makuba and River Masarwa (River Bushmen) north of lat. 190 on the Okovango main stream blocking the entrance of effluent channels in the papyrus beds bordering the Okovango.



Thomas Tlou's "The Taming of the Okavango Swamps -- The Utilization of a Riverine Environment, 1750-1800," Botswana Notes and Records 4 (1972) brings us a bit more up to date, though not in the sense that the crafts themselves are modernized.

Use of the new large kind of raft, huzhenje, which replaced the cruder baNoka one, was spread to all the swamps by the baYei, and it is their invention. It is made by piling papyrus stems crisscross around a central peg to which a rope is tied. Rafts are driven by the river current and so can only drift downstream. They were used in long journeys where whole villages moved. A typical raft could carry not only people, but belongings, food, and boats. In fact, meals could be prepared on rafts. To stop, the raft was tied to a tree for as long as the group wanted to rest.

"Some Natural and Man-Made Changes in the Channels of the Okavango Delta," Botswana Notes and Records 5 (1973), by Brian Wilson -- not the Beach Boy Brian Wilson, however -- , notes how human activity -- as "indigenous" as it might be -- can effect environmental change.

The papyrus raft, huzhenje or lekawa is a hippo-proof and delightful method (as I can testify) of travelling down river with a load, at very small expense. Mr. Rambwe of Seronga made one for me in 1969 and, with a mokoro, which is desirable as a tender, piloted a party of six from Shakawe to Sepopa, at the speed of the current, of 2 to 3 km/h. It was a small lekawa, 2.8 m by 2.7 m and at the end of the 100 km journey we were finally able by very great effort to manoeuver it and tie it up in a backwater where it could do no harm. But traditionally makawa seem to have been just abandoned, it being very difficult to do anything else. In 1937 Naus writes to the Resident Commissioner:

"I know that it is not possible to forbid the natives using these rafts to transport their grain, as the hippos would smash up dugouts but ... it might be possible to get the Acting Chief to request (them) to pull the rafts out of the river after . . . their journey."

Brind in 1953 writes, "This form of travel seems to have died out for some time". Mr. Peter Smith, however, found an abandoned lekawa caught in the Letetemetso channel in 1972.

At the beginning of this century, or earlier, the bad effects of abandoned makawa were noticed by travelers. Streitwolf cited by Passarge, quoted by Stigand, speaks of blockages on the Thaoge being caused by such abandoned rafts: "little floating islands 15 to 17 ft. in diameter by some 5 ft. deep... blocking the entrance of the effluent channel in the papyrus bank bounding the Okavango." Ellenberger gives full details of many such blockages on the Nggokha. As I have shown, once a blockage is initiated, by whatever means, it will usually tend to grow.

Floating Lighthouses

As we're at sea, we'll note the floating lighthouses, at least the ones that look like such.

"To Span the Ocean, Further Details of the Extraordinary and Gigantic Scheme of a Brooklyn Inventor," New York Herald, October 11, 1896

The lifesaving plan provides for the establishment of small floating lighthouses placed at intervals of a mile, unsinkable, lighted by beacons that would burn by automatic means and require attention but once in four or six months, and provided with foghorns that would sound their warning notes in fierce blasts by means of compressed air, stored automatically by the rocking motion of the buoy.



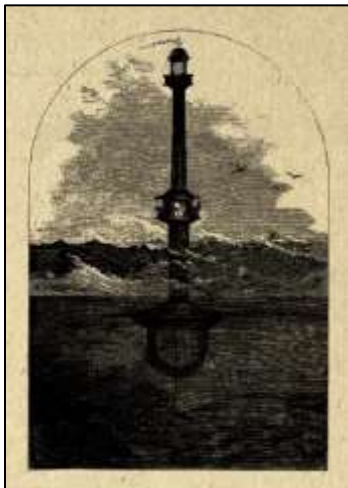
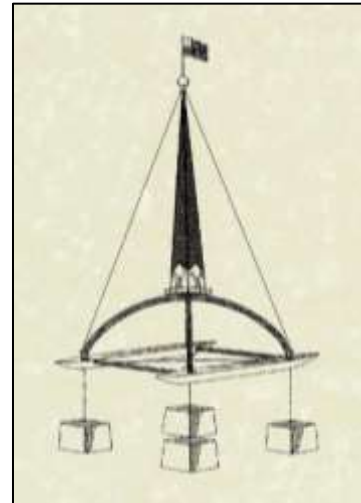
From the surface of the water ladders would be placed to enable the shipwrecked travelers to reach the deck of the buoy, and from the deck, by opening a keyless door, admittance would be gained to the interior of the buoy. The opening of the door would send an alarm ringing down the chain of buoys until the call for help would reach a station where willing hands would be ready to dispatch instant aid to the castaways.

Sans the light tower, the idea's the basis for the modern oceanic rescue pod.



Floating Lighthouse (1902) U.S. 708287 A

The object of the invention is to produce a lighthouse of this type supported by buoys or equivalent structures and embodying means whereby the buoys or their equivalent may be submerged deeply in the water in time of storm, so as to anchor the lighthouse rigidly and firmly in position without regard to the force and height of the waves



A conceptual (and unstable) design, a modern light buoy and a dog-retrieval version.

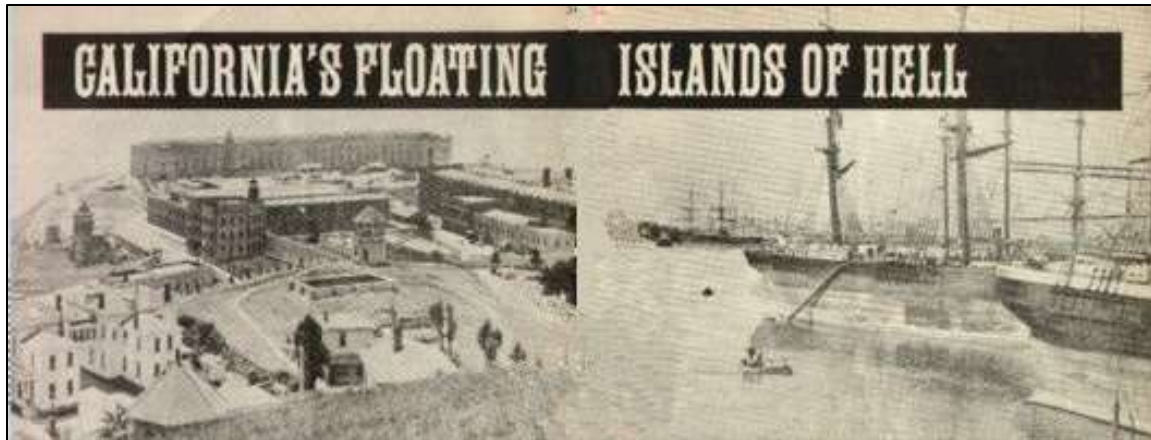


St. Nicholas Floating Lighthouse at the confluence of Russia's Irtysh and Ob rivers, 8 meters high, 10 tons, floats on a submerged pontoon.



Patriarch Kirill consecrates the lighthouse.

Floating Prisons



"California's Floating Islands of Hell," West, August 1969. San Quentin Prison took over the unfortunates incarcerated on the original hell-ships, whaling vessels converted to harbor dungeons.

For the Pool

Not quite a ship, but marketed as a floating island. As with such advertisements, the models are small people.



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CHAPTER 48

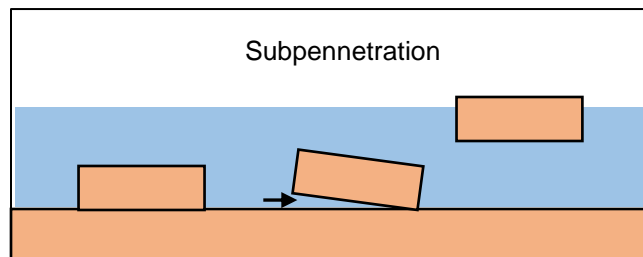
WATCH THE ISLAND BOB

Some floating islands bob in the water, sinking (perhaps to full submergence) into the water and later re-emerging.

We will begin this chapter on the general side by simply noting a few early theories addressing the question of why, in some cases, islands suddenly emerge, and in other cases, why islands affix themselves to the bed.

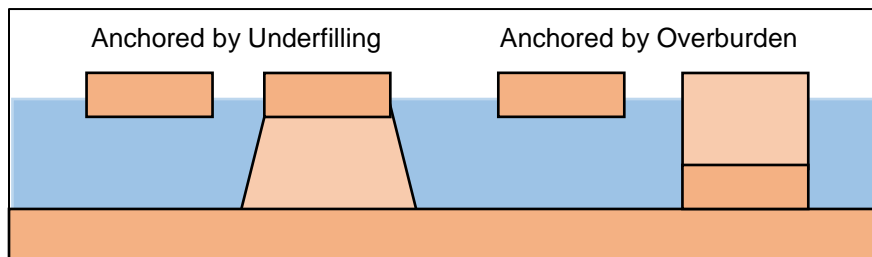
An Account of Ireland, Statistical and Political (1812) by Edward Wakefield

Among the latest phenomena of this kind are those near the peninsula of Rovigo, a part in Lombardy, which is encompassed by the Po and some other rivers. There are here several islands very different in their form and size, which at times become the sport of the winds and the currents; the largest of them contains about a hundred acres. They consist of strata forming a crust on the ground, and when the rivers break in so that the water penetrates below them, they rise up and float.



A Treatise on Rivers and Torrents (1818), by Paolo Frisi,

When the sands and earth brought down by the tributaries either fill up the whole space between the bottom and the cores, or make them specifically heavier than the water, and sink them to the bottom, they are no longer anything but an elastic and compressible body, placed on a firm base, yielding at first uniformly, but, in the end, when compressed by the weight of an embankment, incapable of causing any derangement.



"Der Gegenwärtige Stand der Seenforschung," Fortschritte der Naturwissenschaftlichen Forschung (1913), by W. Halfpass, regarding the emergence of an island in Seeburgersee,

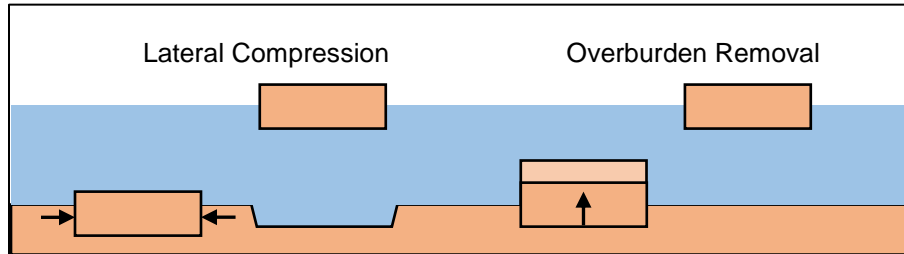
*On 19 August 1911...I an island appeared, 25 meters long and 4 meters wide, rising 7 to 35 centimeters above the surface and ending in a north-facing ridge along an open gap. Geh.. Borgrat von Koenen from Göttingen, who visited soon thereafter, found the island again sunken and covered with numerous *Unio* and *Anodonta* as well as *Bithynia*; He believes that the plastic*

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peat of the subsoil was compressed by side pressure due to a particularly low water level in the summer of 1911.

On 18 August 1653, an island appeared at the same place, and disappeared again after a short time. Obviously we are dealing with an analogous phenomenon, as observed on the night of October 23, 1910 at Ögelsee in Beeskow in Brandenburg.

Potonie, who has carefully studied this phenomenon, takes the view that these and other earlier observed suddenly arisen islands are caused the buoyancy of gases formed by the Saproeliten in the lakes. While they otherwise gradually escape, they are sometimes covered with a sand cover which, when enough gas has accumulated, is blown up and lifted the island to the surface.

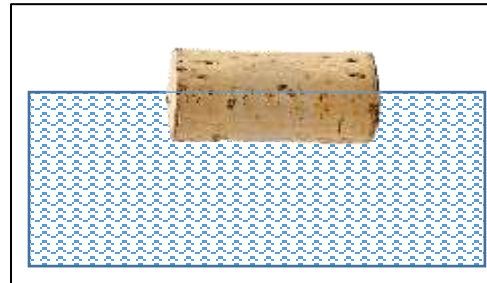


The correct explanation lies in rudimentary physics, but physical peculiarities can lead to a variety of manifestations.

The Floating Island as a Freely-Floating Cork

We'll begin with the simplest case, that an untethered buoyant object, an island in our case, but it could just as well be a cork.

Archimedes' Law (Chapter 19) says that such an object floats at a constant level with respect to the water surface.



The History of New-Hampshire 3 (1792) by Jeremy Belknap, mentions the floating island of Atkinson, New Hampshire, in a letter of Rev. Mr. Porter. We underline the confirmation of Archimedes' Law.

In the township of Atkinson, in a large meadow, there is an island, containing seven or eight acres, which was formerly loaded with valuable pine timber, and other forest wood. When the meadow is overflowed, by means of an artificial dam, this island rises in the same degree as the water rises, which is sometimes six feet. Near the middle of this island, is a small pond, which has been gradually lessening ever since it was known, and is now almost covered with verdure. In this place, a pole of fifty feet has disappeared, without finding a bottom.

Porter continues to the limiting case, when the pond is drawn down such that the island rests on the bed.

In the water of that pond, there have been fish in plenty, which when the meadow hath been flowed, have appeared there, and when the water hath been drawn off, have been left on the meadow, at which time the island settles to its usual [most-observed] state.

There's little more to be said regarding the island's rise and fall, but as the island was a regional curiosity, we'll add a bit of the reporting.

The History of Haverhill (2009), George Chase, quoting a Dr. Dwight, undated, but apparently early in the 19th century,

I was informed by unquestionable authority, that in a small lake in this town, about half a mile east of the Congregational Church, and at a little distance from the river, there is an island, which has immemorially floated from one shore to another, whenever it was impelled by a violent wind. Lately it has adhered for a considerable time to a single spot; and may perhaps be so firmly fixed on the shelving bottom, as to move no more hereafter. Several trees and shrubs, grow on its surface; and it is covered with a fresh verdure.

Geography Made Easy, Being an Abridgement of the American Universal Geography (1802) by Jedidiah Morse,

In a meadow in Atkinson is an island of six or seven across that rises and falls with the water of the meadow, which is sometimes six feet.

The report of a floating island found its doubters, however. From The Monthly Anthology and Boston Review 8, 1810, edited by David Adams, Samuel Thacher and William Emerson,

At the close of this chapter is inserted a letter from the Rev. Mr. Peabody, describing a large floating island in the town of Atkinson, containing seven or eight acres, which was once covered with large forest trees, and which rises and falls with the water. This letter is inserted without comment. As Dr. B. had requested information from the clergymen in the state, he perhaps thought himself bound to publish it, and leave his readers to judge of so extraordinary a relation. The story, notwithstanding its absurdity, has found its way into the geography of Dr. Morse and other publications.

John Farmer and Jacob Moore counter in "Atkinson," A Gazetteer of the State of New-Hampshire (1823).

The correctness of this account of the floating island, given by Dr. Belknap, and which was furnished him by the Rev. Mr. Peabody, has been doubted, but there are persons still living who can substantiate the fact. The artificial dam is now in ruins.

John Melish's A Geographical Description of the United States (1826) included the claim in his list of proclaimed geographical oddities.

In Durham township, a rock so exactly poised on the top of another that it can be moved with the finger.

A floating island in Atkinson township.

John Hayward, in The New England Gazetteer: Containing Descriptions of the States, Counties, Cities and Towns in New England (1857), looked to "reliable persons" for verification.

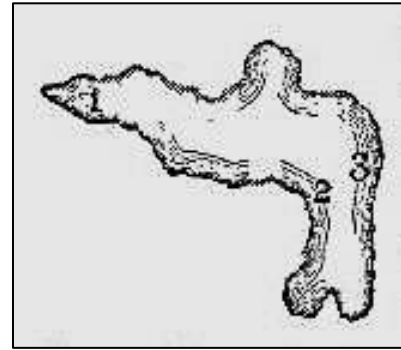
In a large meadow is an island of six or eight acres, which, when the meadow is over flowed by means of a dam, rises as the water rises, which has been as high as six feet. The fact of such a floating island was noticed by Dr. Belknap, and has since been certified to by reliable persons.

An 1860 recollection by John Bartlett of Roxbury, published in The History of Haverhill (2009) by George Chase, in fact provides us some first-hand detail.

According to my recollection there were two islands; the smallest had a maple tree on it of two or three inches diameter; this was broken up and destroyed long before the larger one, which continued for years, and at last grounded when the pond was full, at the east end under the hill, where no wind could reach to drive it off. As the water fell, the island became rooted to the ground; when the water rose, the next season it flooded the island, and it soon broke up. I should say that the larger island was 60 feet long by 15 or 20 broad; on the borders were bushes, such as formerly grew, standing in the water at the western end of the pond. The island was composed of a soggy mass of fine vegetable matter, of sufficient firmness to sustain

the boys who were frequently on it; they would sink down a few inches, the water oozing up around their feet.

As you will see, I have scratched out a sort of diagram of the pond, by no means accurate, but it will show you, however, the different positions, where I have seen the larger of the two islands; many a time have I been on it and gathered cranberries; and when it was situated at the entrance towards the plug, where it stood for a whole season, I frequented it for the purpose of fishing, from its outer side, from an opening in the bushes, I have marked the spot on the diagram, thus (2).



Mr. Hazen Morse will remember being on the island while it lay there. As the inner edge of the island did not come to dry land, the boys placed some rails to assist in getting on and off. In 1827, I saw the rudiment of a new island afloat at the east end of the pond; it was perhaps 6 or 7 feet long; what became of it I don't know -- some bushes were on it. So much for the Floating Island.

American Notes and Queries (1890) William Walsh, Henry Walsh, William Garrison and Samuel Harris, eds.

Another (so-called) floating island has been described as existing at Atkinson, N.H. Does this still float?

No. The one-time bobbing island of Atkinson Pond is now but a marshy meadow.

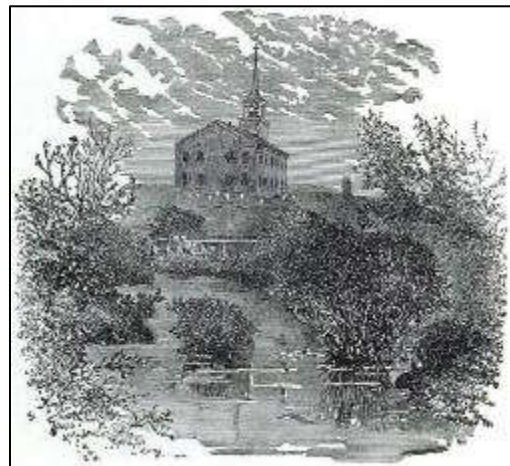
A similar observation, this one from Hopatcong Historama (1955) by the Lake Hopatcong, New Jersey Yacht Club, on Hopatcong's floating island.

A twisted mass of shrubbery and tangled roots which rise and fall with the water so that, no matter how high or low the water is, the island always remains the same distance above water level.

The serene "Floating Island, Newburyport, Mass," A Book of New England Legends and Folk Lore in Prose and Poetry (1901) by Samuel Drake, isn't of Newburyport's floating island. Newburyport's buoyant geographic feature was a flotation much larger.

From the Christian Secretary, July 28, 1827

In a pond about one mile south of Newburyport is a floating island 104 feet in breadth and 120 in length, containing nearly half an acre. It is thickly studded with dogwood, and has upon it six large trees, two of which are three feet in circumference, besides several clusters willows. These all rise and fall with the island.



The pond is dry in the summer, but in the fall and spring has from 3 to 12 feet of water. The island always preserves the same elevation above the surface of the water, but is not entirely detached from the bed of the pond, being fastened to it by the roots of the trees.

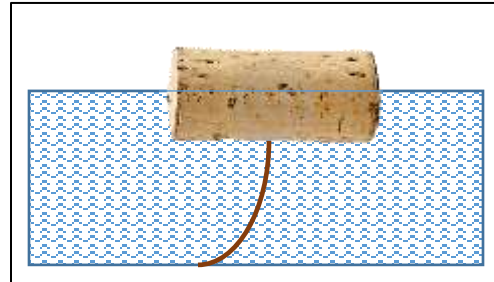
"A Floating Island, The Great Natural Curiosity in an Old Massachusetts Town." Decatur Daily Republican, June 1, 1888.

The floating island is the greatest natural curiosity in the town of Newbury, and perhaps is the whole country. It is in Meeting House Pond, back of the Oldtown cemetery, and possibly many of the younger people of its immediate vicinity have never heard of it. We notice that many of the trees have fallen before the woodman's axe, and some have died from natural causes; and therefore it does not show the thrifty appearance of a half century ago. It is the only floating island that we know of in the world. So far as is ascertained, it reals in the water, rising and falling with the level of the pond. It is a matted mass of tree roots, with earth enough to support large trees, chiefly willows, but never resting on any solid bottom; and indeed we are not aware that a solid bottom has ever been reached in the pond.

The mystery of the island is that it should float in water. How then is it sustained at a uniform height of five inches above the waterline. Mr. Morse says, and we think he is correct, that it is floated by what is sometimes called "marsh gas," which has been noticed by many people who at different seasons of the year has caused the gas to burn on the surface of the water by alighted match, so that the flame was clearly visible. The idea seems to be supported by the further fact that the water in winter, in some places is of higher temperature than in others, occasioning open places in the ice breathing holes, as they are termed.

The Floating Island as a Tethered Cork

A tether -- roots affixed to the bed, in our floating island case -- potentially constrains the lateral movement and the maximum elevation of flotation.

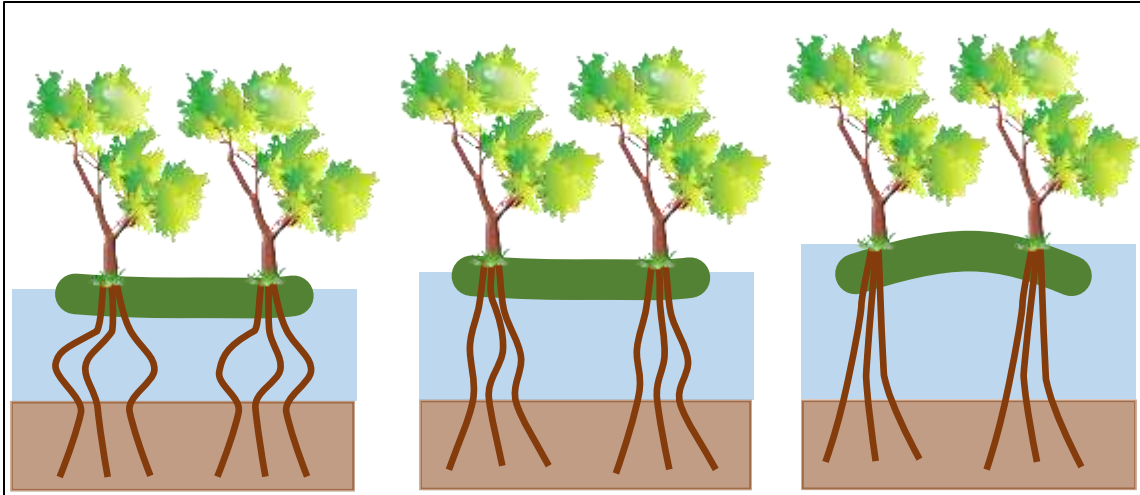


"Notice of Floating Islands," American Journal of Science and Arts, January 1, 1827, by Amos Pettingall adds to the description of Newburyport's floating island.

The pond is usually dry during the summer months, and at these seasons the island has been found so low that you would descend, perceptibly, in passing to it from the dry bed of the pond. I visited it yesterday, and found it elevated about eighteen inches above the level of the pond's bottom, owing to the rains that have recently fallen.

The customary rise of the pond in the fall and spring is about eight feet, although it has been known to rise twelve: the island preserves the same elevation above the surface of the water in the different periods of its rise.

When the pond was very high, these large trees standing upon the margin of the island overhang the water with considerable obliquity, owing, probably, to the roots being brought to a great degree of tension, and preventing the exterior part of the island from rising with the center.



Jonathan Otley notes what seems to be a discrepancy regarding the trees and flexibility in "Remarks on an Account of a Floating Island," Memoirs and Proceedings, Manchester Literary and Philosophical Society (1831).

In some places a stratum of peat earth, strongly matted with roots of grass, &c. may be found to rest upon a clayey, gravelly, or even rocky substratum. In rainy seasons the water from higher grounds being filtrated through the more porous soil, insinuates itself underneath, and not easily finding vent, raises up the lighter stratum to a certain extent ; while the surrounding parts being of a less extensible nature, or more strongly attached to the substratum, suffer themselves to be overflowed.

Of this kind seems to be the floating island of Newburyport, but it appears rather extraordinary, that it should be able to support "six large trees," and yet yield so considerably to the weight of a man.

And we're not done with Newburyport yet. From the Saturday Evening Post, May 5, 1827, a letter from P.A. Browne

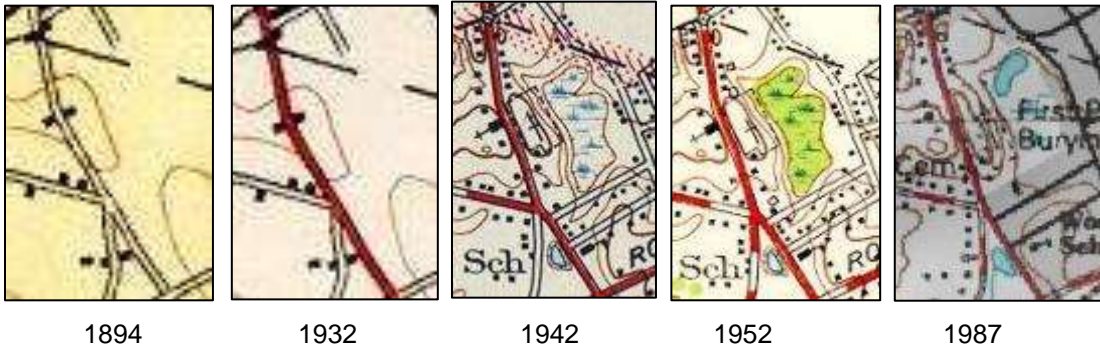
Sir: I have observed in the 12th vol. of the American Journal of Science and Arts your account of a floating island in a pond, in or near Newburyport, which has excited considerable interest here. I feel a strong desire to know whether this phenomenon cannot be explained according to the theory of bituminous fermentation of Mr. Jas Parkinson. You will recollect that the gentleman accounts for the formation of peat, coal, and some other fossils, upon the supposition that vegetable matter imbedded in the earth undergoes, in addition to the fermentations usually denominated the saccharine, the venous, and the putrid, another, which he denominates as follows:

The author proceeds to enumerate the hypothesis of James Parkinson as expounded in Organic Remains of a Former World (1820), a quasi-scientific attempt to wed the emerging field of geology with Biblical creationism.

"The Great Natural Curiosity in Meetinghouse Pond, Newbury," Boston Daily Globe, May 29, 1887,

Mr. Morse says, and we think he is correct, that it is floated by what is sometimes called "marsh gas," which has been noticed by many people who at different seasons of the year have caused the gas to burn on the surface of the water by a lighted match so that the flame was clearly visible. This idea seems to be supported by the further fact that the water in winter, in some places, is of a higher temperature than in others, occasioning open places in the ice breathing holes, as they are termed.

The snippets below trace the site's topographic mapping. The carry-over of cartographic detail suggests when re-surveys weren't pursued. The pond's initial absence is probably oversight, but the fact that the pond was said in 1827 to be dry during summer months suggests that there wasn't much to it.

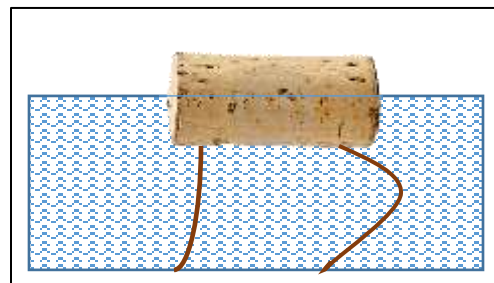


A rooted peat mat in the southern portion of pond is all that remains of the once-notable feature..



The Floating Island as an Unequally-Tethered Cork

Should opposite ends of the island be affixed to tethers of not the same length, the island will begin to tip when the shorter of the tethers is fully extended.



A case in point would have in Spain's Laguna de Una. As can be seen in the aerial photo, today's lake is largely overgrown with aquatic vegetation, but in old records, we find what once was.



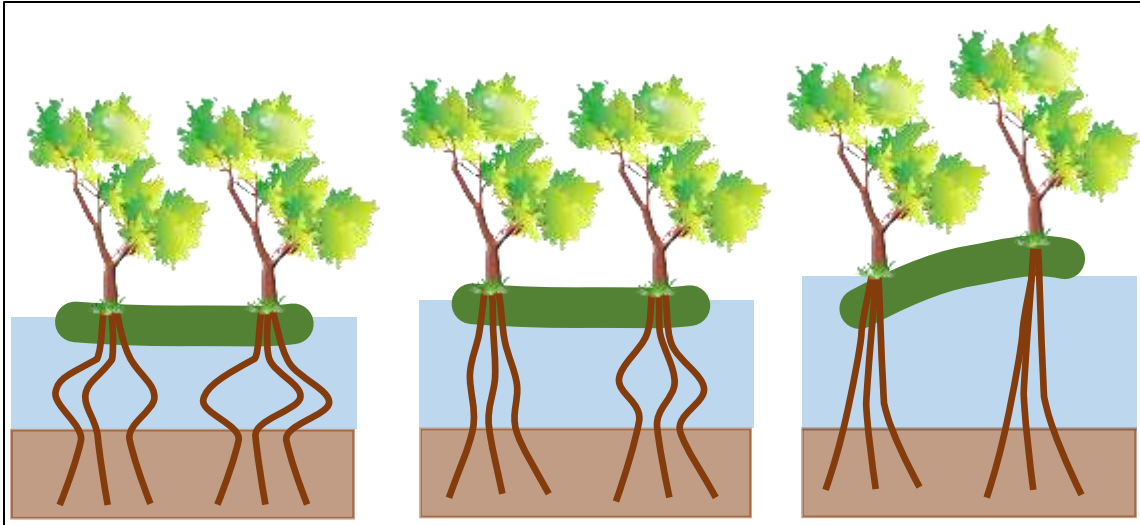
Juan Martir Rizo, <u>Historia de la Muy Noble y Leal Ciudad de Cuenca</u> (1629)	Floating island 40 feet in circumference with trees.
Juan Luis de la Cerda, <u>P Virgilio Maronis Aeneidos Libri Sex Priores Argumentis, Explicationibus, et Notis Illustrata</u> (1642)	Author saw floating island that was gradually diminishing.
Mateo Lopez, <u>Memorias Historicas de Cuenca y su Obispado</u> , (1787)	
Trifon Munoz y Soliva, <u>Historia de la Muy N.L.E.I. Ciudad de Cuenca y del Territorio de su Provincia y Obispado</u> (1867)	According to locals, the island became fixed to the shore long ago.
Daniel de Cortazar, <u>Memorias de la Comision del Mapa Geologico de Espana. Descripcion Fisica, Geologica y Agrologica de la Provincia de Cuenca</u> (1875)	
Clemente Saez Garcia, "Netas y Datos de Estratigrafia Espanol," <u>Boletin la Real Sociedad Espanola de Historial Naturai</u> 44 (1946)	Floating island in the early 1920s no longer exists.

In the last citation we find the mention of uneven rooting,

The island is known to have existed in the period 1920-1925, but without much grass or vegetation. Accessing the island by boat, one could insert a post several meters in length through it without passing the roots which apparently kept it anchored to the bottom.

The reality of the island's buoyancy has been confirmed over a long period. When the reconstruction was finished, closing the gates raised the water three meters. The island did not dive, but kept rising to the new surface of the lagoon, its shape somewhat sloped due to the unequal length of the fully stressed natural moorings.

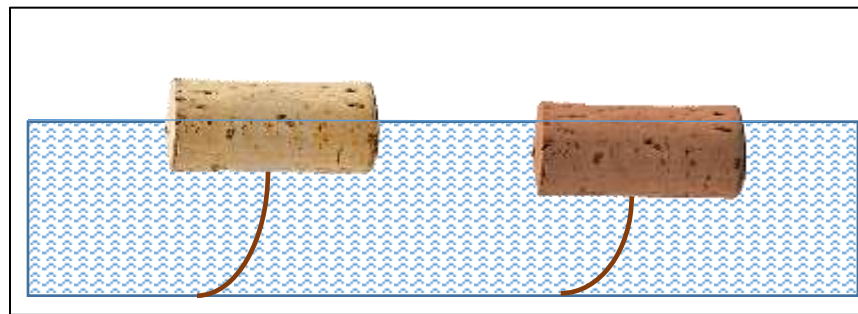
This curious phenomenon of the floating island cannot be observed today. The constant variation of water level must have led, in the end, to the breaking of the anchors, its liberation leading to the removed by the Company for fear that its drift might obstruct the mouth of the lagoon channel.



The Floating Island as a Tethered Cork of Nonstationary Buoyancy

What if our cork changes its density over time?

For this, what are known as "periodic islands," we'll begin in England.



Derwentwater, Cambria

Situated in England's Lake District, the "floating island of Derwentwater" was well situated for erudite scrutiny when natural science was emerging as a scholarly arena. We could, if we liked, dispense with bygone days and confine ourselves to objective facts, but the heart of the story lies in how today's understandings came to be.

We'll work our way through the progressive insights, beginning with "Letter from Keswick," European Magazine and London Review 20, November 1791.

I am told that the lake contains near thirteen hundred acres, in which is included St. Herbert's Island, Vicar's Island, Lord's Island, Ramps-holm, Ling-holm, Trippet-holm, Otter Island, and the Floating Island. This last is a singular curiosity, something of the nature of Solway Moss, that some years ago floated apparently on dry land. This floating island is about twenty yards in diameter, nearly circular, and slopes from its center; it seems an assemblage of matted moss-roots, under which a brook (swelled by great rains) insinuates itself, and swells it above the surface of the lake; hence it only appears in rainy weather, and sinks to the bottom in dry.

From "Some Observations on the Agitations of the Lake of Derwent Water, and its Floating Islands," Philosophical Magazine 1:11 (1802-03) by "D.I.P.," the fashion of the day being to mask the authors' identity.

My informant, a boatman of the name of Walker, says he has frequented the lake for about 27 years, and heard of perhaps 13 islands, though previous to that time for 20 years none had appeared. One rose last year, and two this year, which came up within two days of each other.

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The first rose on the 11th of September, and part sunk the 27th of the same month. Sometimes one comes up and is down again in 24 hours, and sometimes they stay two months.

One of them in the year 1798 was 180 yards long, 50 yards wide, and stayed on top of the water for six weeks. One was pierced and found seven yards thick. They frequently burst and are rent so wide that boats can sail up and land passengers at the edges of them to walk about on the island.

One was a foot high perpendicular of land above the level of the water. They are connected always by one side to the gravelly turf at the edges of the lake. Ehen within a few days after their first appearance, a pole is run three to six feet into them and drawn out again, the air for several seconds bubbles up like a pot boiling violently; a smell arises like gunpowder and it has been said that with a candle you might light a bottle-full once collected.

We pushed the boat-hook about four feet into it. The first part, about two feet, appeared all mud, then less firm, and full of partially-decayed leaves and roots of trees and plants and the water bubbled up for a few seconds about two inches high, occasioned by the air that followed the hook out.

"Particulars of a Floating Island that Appeared in Derwent-Water, Cumberland," The County Annual Register for the Years 1809 (1810) is rich in wording.

It began to emerge on the 20th of July, 1808, and, in a very short time, appeared above the surface. It is situated at the head of the Keswick Lake, about a stone's cast from the shore. It contains about an acre of ground, and is quite stationary. At first it was of a dark brown color, but soon became covered with verdure. By thrusting a pole in several places to the depth of three yards the water rushed up, consequently it is of that thickness, and unconnected with the bottom.

That it is also unconnected with the sides is evident, as boats sailed entirely round it, and people sounded with long poles without finding a bottom. It is of an oblong shape; and in the middle of it is a large hole, about eight yards long, and two broad, evidently made by the confined rarefied air. The depth of soil composing it, is in some parts two feet, and in others more, and in forcing a stick through it in different places, air rose in large bubbles, and as this confined air escapes, the island, it appears, lessens, and at length sinks by its own weight, to the bottom of the lake. Its sides adhere to the neighboring soil with a steep descent, except at one corner, about six yards in length, which appears like a bank. This bank has actually been the remains of the sides of a hole of a former island, for these temporary islands are found to change their positions at every appearance, and the present is somewhat nearer the shore than the former ones have been.

A secondary island made its appearance about the same time, at some distance from the principal one, and nearer the shore, of a circular form, about eight yards in diameter, and divided completely in two by a rent of about one yard wide, and three yards deep, reaching to a considerable distance on each side of this island, and evidently being one of those numerous crack's winch may always be discovered in the bottom of this part of the lake, which we presume is a communication of the waters beneath with those above. The island gradually sunk during some weeks, till the night of Friday, the 7th of October, when, in consequence of rain, the lake arose about five feet, and the island was covered with water. The lake rose above a foot higher on the 7th of August than on the 1st of October, and yet the island was - larger in extent, and higher above the water than on the former day.

Typical of the era's news reporting, "An Old Friend," The Times, October 4, 1850, drawing from the Cumberland Packet,

That periodic visitor, the floating island in Derwent Lake, Keswick, made its appearance above the surface of the water in the course of last week, after having been submerged exactly 12 months.

Chapter 48 -- Watch the Island Bob

The poet William Wordsworth noted the island in his Prose Works (1896)

It may be worthwhile here to mention (not as an object of beauty, but of curiosity).that there occasionally appears above the surface of Derwentwater, and always in the same place, a considerable tract of spongy ground covered with aquatic plants, which is called the Floating, but with more propriety might be named the Buoyant, Island.

A few photographs,



1821 and Today



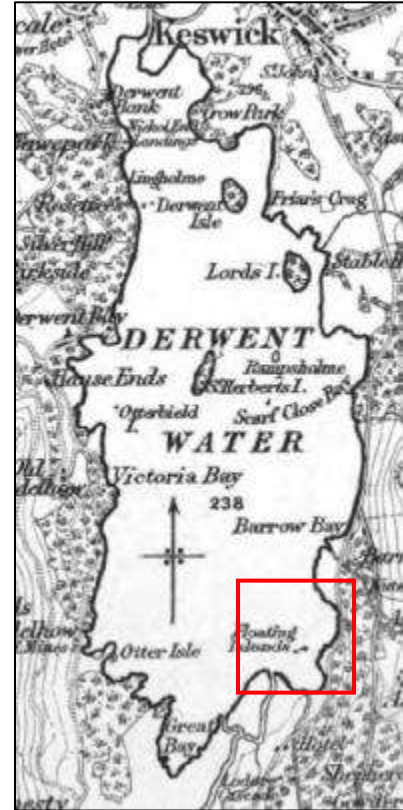
Early Photographs. On the left, a Girl Guide is standing on the island

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The island's location, generally about four hundred and fifty feet from the south-eastern shore,



1787

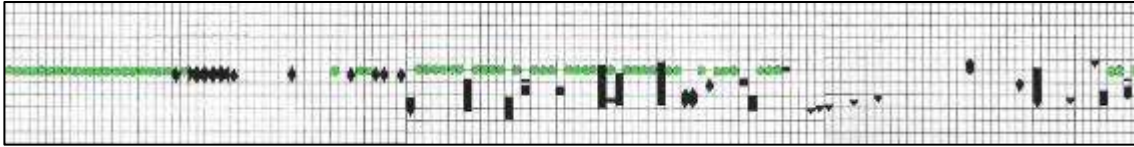


1884



Today

Island appearances are charted below, 1753-1888, left to right, January to December, top to bottom. A green dot indicates a year having no floating island. The 32 years without record, one way of the other, have no marking.



The island appeared in 39 years and did not appear in 59. The count begins with 20 consecutive island-less years, followed by 7 short-lived June islands in the next 8 years. From roughly the next half-century, the island appeared roughly every 4 or 5 years. A decade of somewhat-consistent short-duration late-summer appearances followed. The record ends with the every-few-year pattern.

According to Jonathan Otley's A Concise Description of the English Lakes, And Adjacent Mountains (1825),

Within the last twenty years it has emerged five times, remaining upon the surface for longer or shorter periods.

The island size varied, appearance to appearance. Estimates include,

- From a few perches (160 perches being 1 acre) to nearly an acre,
- 50 yards by 12,
- Upwards of 90 yards long by 20 broad,
- Nearly 2 acres,
- Only a few perches,
- About 20 yards in diameter,
- About half an acre.

The island's reported thickness,

- 6 to 8 feet,
- 3 to 6 feet,
- At least 5 feet, 6 inches of soft material at the margin of the island,
- Rising through about 4 or 5 feet of water, but this distance varies from 3 to possibly 7 feet,
- The normal depth of water over it when the layer is resting on the ground is about 4 feet,
- Sloping gradually from the center to the circumference, and from thence as far as the eye can distinguish, the sloping is more sudden,
- Extending in a gradual slope under water, a much greater portion is raised from the bottom than reaches the surface of the lake.

The island's composition was largely decomposing peat. From Otley (1825),

For a few inches in depth it is composed of a clayey or earthy matter, apparently deposited by the water, in which the growing plants have fixed their roots; the rest is a congeries of decayed vegetable matter forming a stratum of loose peat earth about six feet in thickness; which rises from a bed of very fine soft clay.

*When at rest in the bottom of the lake it has the same appearance as the neighboring parts, being covered with the same vegetation, consisting principally of *Littorella lacustris*, interspersed with *Lobelia dortmanna*, *Isoetes lacustris*, and other plants common in this and all the neighboring lakes: after remaining some time above the water its verdure is much improved.*

From Chambers's Journal, February 1886,

The aquatic plants growing on the bed of this portion of the lake are, when living, all specifically lighter than water, which may easily be proved by detaching any of them from the bottom, when they will be found to rise to the surface. They grow, wither, and decay, their roots matting together amidst the finely divided turf, itself the remains of various mosses, producing what Otley aptly calls a "congeries of weeds."

According to The Floating Island in Derwentwater: Its History and Mystery (1888) by George James Symons,

The soil... almost entirely soft marly peat, the organic forms broken up and nearly destroyed, and very few animalculae such as are usually abundant in decomposing vegetable matter.

From "Floating Islands," Bulletin of the Geographical Society of Philadelphia, January 1914, by Sidney Powers,

The ultimate origin of the mat of decomposing vegetation of which the periodic island is a part must be traced far back of the middle of the eighteenth century to the time when Bassenthwaite Lake and Derwentwater formed one long body of water. The former is now 21 feet lower than the latter from which it is separated by two and one half miles of broad level plain. The filling of this plain has been brought about largely by the sediments carried in by the Greta River, which joins the Derwent just north of Derwentwater. Concomitantly with the accumulation of this detrital material, a bog was forming over the very shallow part of the lake where the periodic island now is. This bog would have the form of a shelf of vegetation.... Under this mat would accumulate a layer of diatomaceous earth as has been found under the periodic island.

"Floating Islands." Chambers's Journal, April 13, 1850,

There is an isle which we cannot place in any of the above-named classes; in fact we know not where to place it—simply because its cause and nature have not yet been satisfactorily explained, for which reason many have been inclined to deny its existence altogether. The doubt, however, may be set at rest by an autumnal visit to the lake of Derwentwater. The island in question never appears except when the water is high; it is seen opposite the mouth of the Cat-gill stream, and is sometimes visible for several days, and then disappears for as many weeks or months, though it may even during that interval be discovered at a depth of about two fathoms. It is nearly circular, measures about six feet in diameter, and slopes gradually from the center to the edge of the water. This lake, like Loch Lomond is sometimes agitated in a remarkable manner when the winds seem all at rest, which is usually attributed to what are termed "bottom winds" -- currents which may have some undiscovered influence on the rising of the island.

Ackerman, however, suggests, that as the water from the torrent of Cat-gill seems totally lost in the ground, as the bottom of the lake is densely covered with a fine, close grass, with strong and matted roots and as the slope from the center of the isle is more precipitate after very heavy rains, the phenomena may be caused by an under-current from the stream which vainly struggles to force its way between the roots of the grass, and mingle with the waters of the lake; and that, failing in this, it has yet strength enough to force a portion of the turf to the surface. This theory, though not conclusive, is ingenious, and deserves attention; more especially as it is corroborated by the fact, that when Ackerman pierced the island with his fishing rod, the grass roots embraced the slender point so closely that no water could escape; but when he withdrew it, the water spouted up to the height of two feet.

Per Bernoulli's Law, Chapter 20, the height of a spout can be no more than the pressure head. The puncture would have had to be where an impermeable mat's top surface was at least two feet below the level of the surrounding water. The floating isle of Derwentwater does not satisfy this condition.

In A Fortnight's Ramble to the Lakes (1795), Joseph Budworth reports the floating island to be

As green as a meadow

As for solidity, according to Budworth (1795),

There are very few people in the neighborhood who have not been upon it.

Symons (1888) reports being told that that the town band performed upon it, though given all other accounts, his "I was told" suggests his gullibility.

The highest part was about a foot above the level of the Lake; and, although it was wet and oozy, I was able to stand upon it for ten minutes without sinking more than two or three inches. When a plank was laid on the island, several persons could stand upon it without perceptible effect. I was told that on one occasion the entire town band was taken from Keswick to the Island, and landing upon it, played several airs.

A photo at the beginning of this section shows a Girl Guide standing on the mat and Chapter 37 shows a close-up of what happens to one's feet.

"A Floating Island," Geographical Spice: A Manual for the Use of Teachers (1893), by Eliza Morton,

In the south of Cumberland County, in the beautiful lake of Keswick, in England, is a remarkable island that floats on the water like a bladder. It consists of a mass of earth, an acre or less in size, and six or more feet thick. This is covered with vegetation, and the entire island is buoyed on the surface of the water by means of millions of air-bubbles.



Various causes were proposed to explain the island's intermittency. One had to do with a nearby tributary. Another wondered about the role of wind.

Cat Gill enters Lake Derwentwater approximately 200 yards from the floating island, as shown in A Survey of the Lakes of Cumberland, Westmorland and Lancashire (1787) by James Clarke.



From that work,

The water which, during a violent rain, pours down the Cat-gill, seems totally lost. It is, however, evident that it must disemboague itself into the lake. I therefore think that this torrent, after running among the loose stones to some distance, endeavors to force its way and mingle with the waters of the lake; the roughness of the super-incumbent turf prevents this from being easily effected; the force and weight of the water therefore raises the turf into a convex form, and, during the continuance of the torrent, gives it the appearance of an island.

Subsequent references passed along the theory. According to John Housman's A Topographical Description of Cumberland (1800),

Another hypothesis accounts for the phenomenon by the agency of a small subterranean brook, which falls from the mountain opposite the island, and which, making its way below the soil under the lake, forces up the earth by the accumulation of water.

From Otley (1825),

A small mountain stream which pours down a rock opposite the place, and runs underground before it reaches the lake, has been employed in various ways to account for its rising; and many a supposition has been advanced, of the way in which air might be conveyed or generated underneath it.

John Stuart Mill saw Derwentwater's floating island in July 1831. From his Walking Tour of Yorkshire and the Lake District, July-August 1831,

Professor Sedgwick let out some of the gas by making a hole in the island, which immediately sunk several inches, with him upon it. His theory, as we learned from Southey, is that a brook which runs into the lake just opposite to the island (it is not far from the shore) penetrates between the peat, and the clay which is below it, and prevents the peat from adhering to the clay, so that it is easily blown up by the gas which is generated in its own substance.

According to A Companion to the Lakes of Cumberland, Westmoreland, and Lancashire (1834) by Edward Baines

It has been supposed that the water of a small cascade, named Cat-gill, which tumbles down the rocks near this place, and which then finds a subterraneous passage into the lake, may have been the cause of buoying up the Island : but this supposition is generally disallowed by men of science.

From Chambers's Journal, August 1874,

That in Derwentwater is opposite to the mouth of a stream called the Catgill; and the most probable of the many theories which have been proposed to account for it is that which ascribes it to the waters of the stream, when flooded by rains, getting beneath the interlaced and matted roots of the aquatic plants which there form a close turf on the bottom of the lake. This floating island, when it rises above the water, is most elevated in the center, and on its being pierced with a fishing-rod, water has spouted up to the height of two feet.

A two-foot spout indicates a pressurized connection, but as this is the only reports of such, it is most likely inaccurate.

The subterranean conduit hypothesis died with George Symons' The Floating Island in Derwentwater: Its History and Mystery (1888).

If it [Cat Gill] did, and (as has been suggested) entered the bottom of the lake with force, it appears to me that its most probable effect would be to disintegrate and scatter the very loose and light materials of which the islands are composed... We are told that in the fall of the Cat Gill, air and water become mechanically mixed, and so are carried under water, where the air escapes and buoys up the island. In the first place, the mechanical mixture of water and air in Cat Gill is insignificant as compared with that in its two neighbors, Barrow and Lodore. I think that, after its principal fall, it runs nearly 200 yards before going under the stones, and I do not see why, in that distance, the air should not escape; and, besides all this, the island is floated by gas, not by air. Where so little is known, it would be absurd to speak positively, but I do not see how Cat Gill can cause the floating.

A "bottom wind" was likewise seen to perhaps be significant.

A Fortnights Ramble to the Lakes (1795) by Joseph Budworth,

It is said Keswick Lake often wears this appearance a day or two previous to a storm; and when violently agitated at the bottom, an island arises, and remains upon the surface some time. . . .

"Some Observations on the Agitations of the Lake of Derwent Water, and its Floating Islands," Philosophical Magazine 1:11 (1802-03) by "D.I.P.,"

The rising of these islands-is always accompanied with a bottom wind; yet the bottom wind appears frequently without them; and generally after a month or six weeks of dry weather the lake is sometimes partially, sometimes wholly agitated, accompanied by a roaring noise (the probable effects of echo in a calm in that situation). The waves are not long and rolling, but irregular shaped like mountains, 20 inches to two feet in height, like water jumbled in a tub, they frequently strike the boat like a rock, and break in spray from head to stern, not always when it is perfectly calm, but also with a gentle breeze, barely enough to ripple the surface.

The Mirror of Literature, Amusement, and Instruction 16 (1830) by John Limbird,

Another peculiarity has been attributed to this lake in what is called the bottom wind ; which has been described as an agitation of the water occurring when no wind can be felt on any part of the lake. It has been supposed to originate at the bottom of the water; and some have associated this with the last mentioned phenomenon; and ascribed both to those subterranean convulsions by which earthquakes are produced. Admitting, that the waves are sometimes greater than could be reasonably expected, from any wind which can be perceived at the time; yet, I doubt, whether they are ever formed when no wind is stirring: and if such a term as Bottom wind must still be retained, I think it ought to be referred to the bottom of the atmosphere, rather than the bottom of the lake.

A perceived relationship between change of weather and island behavior (Chapter 66) is not particular to Derwentwater, but seasonality needs also to be also considered.

The floating island of Derwentwater is in fact a classic example of methanogenesis, a natural phenomenon recognized long before the chemistry was specified (Chapter 22.5).

Essays on the Natural History and Origin of Peat Moss (1807) by Robert Rennie,

Derwentwater, or Darink water, may denote the lake containing darry, or inflammable matter, but I mention this merely as a conjecture.

A Topographical Description of Cumberland (1800) by John Housman,

Respecting the causes of the island's submerging, various ingenious hypotheses have been offered, though none of them appear to be perfectly conclusive. By some it has been conjectured, that the island is raised by the action of rarefied air, in the following manner:

The air is supposed to be formed when the weather has been hot and dry for many weeks; the immense stones and masses of rock impart their caloric to the soil under the lake, and thus rarefy the air and moisture (the bottom of the lake at this place being composed of a kind of network of tough weeds and grass, so interwoven with the earth as to confine the air); consequently the air, by gradual expansion, would elevate the soil and form the island: and this the more easily, as the superincumbent pressure of the water would be greatly diminished by evaporation. The air gradually disengaged itself by exposure to the sun and atmosphere; the cause which kept the island suspended being removed, it would sink to its former station.

This hypotheses being not altogether satisfactory to some who have asserted that the island had been known to rise in wet and cold weather, whereby that degree of caloric could not be supplied necessary for the rarefaction of the air, they have fallen upon another conjecture.

Housman is misled, however, regarding "wet and cold weather." Rising is a warm-season phenomenon. We continue with Housman's "metallic" hypothesis simply to illustrate the era's emerging, though erroneous, application of chemistry. *They suppose that some metallic substance exists at a depth in this part, which by its attraction for oxygen decomposes a portion of the water in contact therewith; and of course hydrogen is disengaged and passes into an elastic or gaseous form, which being arrested in its progress upwards by the tenacity of the earth, is there retained. And this process being carried on in nature's laboratory, throughout all seasons,*

but more rapidly in hot weather, for a series of years (the interval between the appearances of the island), till a sufficient quantity is collected to overcome the cohesion of the earth, then, no matter whether in dry or wet weather, the ascent of the island is effected.

John Dalton, pioneer in atomic theory, chemically identified the island's gas in "Notes on Gas collected from the Floating Island in 1815 and 1825."

Gas Collected 1815

This consisted of equal parts of carbureted hydrogen and azotic gases, with about 6 per cent of carbonic acid. The carbureted hydrogen was such that one part required two of oxygen for its complete combustion by electricity.

Gas collected 1825

Both phials were examined soon after their receipt, and found to contain a mixture of equal volumes of carbureted hydrogen (pond gas) and azote, with the usual 5 to 10 per cent or carbonic acid. These are the same proportions that were found in 1815.

Otley's "An Account of the Floating island in Derwent Lake," Manchester Philosophical Society Memoirs (1814) determined that marsh gas from vegetative decomposition is responsible for the island's rising. A portion of the lake bottom, about six feet in thickness, separates from the earth, after which the water flows below it, lifting the highest parts to form islands while the lower portions slope to the lake bottom.

As Otley (1825) further explains,

The most probable conclusion seems to be, that air or gas is generated in the body of the island by decomposition of the vegetable matter of which it is formed; and this gas being produced most copiously, as well as being more rarified in hot weather, the earth at length becomes so much distended therewith, as to render the mass of less weight than an equal bulk of water. The water then insinuating itself between the substratum of clay and the peat earth forming the island, bears it to the surface, where it continues for a time; till, partly by escape of the gas, partly by its absorption, and partly by its condensation consequent on a decrease of heat, the volume is reduced; and the earth gradually sinks to its former level, where it remains till a sufficient accumulation of gas again renders it buoyant.

Perhaps the carbureted hydrogen gas usually found at the bottom of stagnant water, may be produced here in greater quantity than in other parts of the lake; and probably this production may be increased by heat. Probably, too, by reason of springs underneath, the upper stratum of earth may not be so firmly attached to its bed; and the surface of the earth in the bottom of the lake being closely interwoven with the roots of aquatic plants, prevents the escape of gas, till the uppermost stratum of earth, being charged therewith, is raised from its bed, and the water gradually gaining admission underneath, easily bears it up, as long as the earth contains air enough to make its specific gravity less than that of water; but, when by exposure to the sun and wind, the earth becomes discharged of its gas, it gradually sinks to its old bed, to remain till a sufficient quantity is again accumulated.

A Companion to the Lakes of Cumberland, Westmoreland, and Lancashire (1834) by Edward Baines,

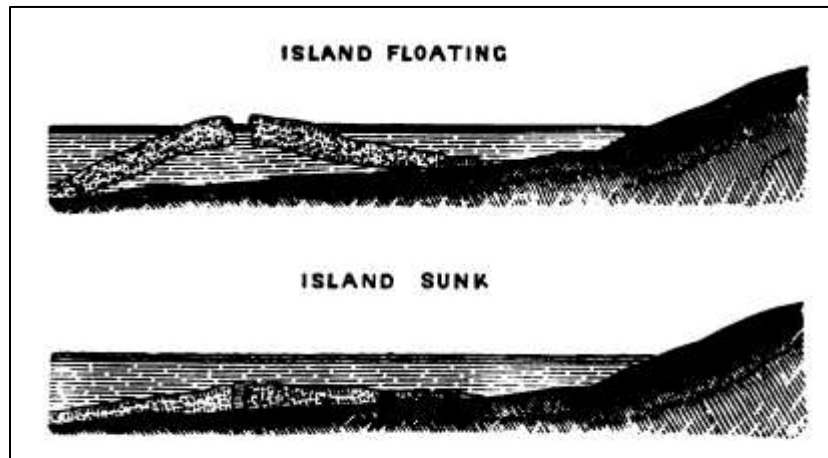
The most probable conjecture as to the cause of the phenomenon is, that the vegetable substances upon it, in the process of decomposition, form a large quantity of gas, which pervades the spongy substance of the island, and makes it so light as to rise to the surface. Heat promotes the accumulation of gas, and when the gas is carried off by exposure to the atmosphere or is condensed by cold, the island sinks. When the surface is pierced, gas issues forth, which has been collected, and found to consist of equal parts of carbureted hydrogen and azotic gases, with about six per cent, of carbonic acid.

William Knight's Memorials of Coleorton (1887), in an 1834 letter from Robert Southey,

Where the gas is generated remains yet to be discovered, but when the peat is filled with this gas, it separates from the clay, and becomes buoyant. There must have been a considerable convulsion when this took place, for a rent was made in the bottom of the lake several feet in depth, and not less than fifty yards long, on each side of which the bottom rose and floated. It was a pretty sight to see the small fry exploring this new-made strait and darting at the bubbles which rose as the Professor was probing the bank. The discharge of air was considerable here when a pole was thrust down.

Symons (1888),

The following woodcuts... indicate what occurs, and how the bed of peat, which usually rests on clay on the bottom of the lake, rises during hot weather, and allows the water to pass below it, while its buoyancy carries portions of it above the lake level so as to form the island.



"Bathymetrical Survey of the English Lakes," Geographical Journal 6.1 (1895), by Hugh Mill,

Only a small area of the weed-covered carpet of the lake had risen to the surface like a large blister, and the surface was not solid enough to land on. The water between the floating island and the shore to east and south was in no place more than 3 feet deep, and usually considerably less. Probing the margin of the island, we found that a boat-hook could easily be driven in 5 feet 6 inches without meeting a solid foundation. On its withdrawal it was followed by a rush of gas smelling slightly of sulphureted hydrogen, but, as the wind was high and rain falling at the time, it was impossible to find whether it would burn.

Powers (1914) further specifies the mixture.

A similar rush of gas may be obtained by poking any mass of peat under water, or even the soft mud on the bottom of lakes. An analysis by W.J. Russell of the gas collected in 1884 by Symons from the periodic island showed,

Marsh gas	82.25
Nitrogen	15.62
Oxygen	0.43
Carbon dioxide	1.70

Chambers's Journal, February 1886,

A frequent source of error is the notion people are liable to carry away who have only seen it from the shore. Many see it, probably for the first and only time, from the top of a stagecoach, on their way to Buttermere or on some other favorite excursion. Just previously, the driver has perhaps directed their attention, by a jerk of his whip over his left shoulder, to Raven's Crag. Now, there is a gap in the trees on the other side, and a glimpse of the lake is caught. 'Floating

Island,' laconically remarks Jehu to the box-seat occupants, and again points his whip, but this time to the right towards the lake. "Where? where?" ask the others behind. "There, there -- don't you see?" and on rolls the coach, some wondering if that little patch of green were it; others, failing to see anything, refer to their guide-books or companions as to what object of interest must next be looked for. Lodore Hotel comes into view, and the minds of the hurried tourists are once more engaged in a hasty examination of the Falls. So the day wears on, and they have seen the Floating Island. But how, and how much? Even the name itself may cause misapprehension, although it would be difficult to give the object a more definite appellation.

D.I.P.'s 2-inch rise of bubbling water noted in this chapter's first citation represents about 0.07 psi of gas pressure, well within the range of pressures generated in natural methanogenesis.

The methanogenesis hypothesis had its detractors, however.

In Excursion to the Lakes (1776), William Hutchinson reports a visit in 1773.

We next visited a very extraordinary phenomenon, an island about 40 yards in length and thirty in breadth, grown over with rushes, reeds, grass, and some willows. We would have landed upon it, but as the water was said to be forty fathom deep in that place, and the attempt rather hazardous, we desisted, and had not the means of enquiring particularly as to its nature. This island rose about 4 perpendicular feet above the surface of the water, on which we were told that it floated; from its magnitude we were not able with one boat to try whether it would move, from the perpendicular line of its then station, or whether it was bound to and connected with the bottom of the lake by the roots of any aquatic plants which appeared upon its surface.

When Hutchinson returned to Derwentwater the subsequent year, the island had not risen, leading him to conclude that it did not float at all, but rather showed itself when the water-level was low.

By the time Hutchinson wrote The History of the County of Cumberland (1794), the author had somewhat given up on explanation.

The tale with which travelers are amused, of a floating island, appears on a strict examination, to be fabulous.

On the other hand, William Ford's Description of Scenery in the Lake District (1839) found Otley's analysis to be sound.

Of the Floating Island, or rather rising and sinking Island, the account given by Mr. Otley is perhaps best and most plausible; as an object of interest, however, it is worth nothing to the tourist.

Harriet Martineau's The English Lake District (1876) dismissed Otley's explanation as unduly complex.

The Floating Island, whose appearance is announced at intervals of a few years, has obtained more celebrity than it deserves. It is a mass of soil and decayed vegetation, which rises when distended with gases, and sinks again when it has parted with them at the surface. Such is the explanation given by philosophers of this piece of natural magic, which has excited so much sensation u during successive generations. Sometimes it comes up a mere patch, and sometimes as large as an acre.

According to the Daily News of August 20, 1884,

This at Derwentwater seems to be merely an accidental accretion of material round some tree-trunk or something of the kind, which, as in the larger island just alluded to [an American one], has become in some way anchored to the bed of the lake, probably at that point not very deep.

Others preferred to garb the island with legend and poetry.

"Legend of the Floating Isle" in Cumbrian Legends: or, Tales of Other Times (1812) by F. Ryves suggests that the floating island first sank to relieve the sufferings of a rebellious and penitent nun, and that her sighs and murmurs can still be heard when the island appears;

*Deep-sounding sighs still float among the trees.
And plaintive murmurs seem to mock the breeze,
When as at times the fated isle appears,
To prove the ebb-tides of departing years.*

"To the Derwentwater," The Mirror, November 27, 1830

*Beautiful lake, I saw, thy crystal breast
Scarce heaving 'neath Spring's renovaline gale;
Thy young romantic isles in pleasant rest;
And all the shadowy barks which o'er thee sail
Bearing -- ay, many a marv'ling, happy band,
As fondly we might dream, to Fairy Laud,*

*I saw thee in the holy, matin hour,
When thou wert loveliest perchance ; a shroud
Hung o'er thy distant brightness -- like a bow'r
It shadow'd thee; yea, many a curling cloud,
Kissing thy radiant bosom, cast a spell
Of beauty o'er thee -- soft, ineffable.*

And others, politics.

"Just the Place to Shift Your Ground," Punch 17 (1849),

The floating island, that is continually swimming in the Lake of Derwentwater -- now floating on its back, now diving and keeping under the water for several hours, so much so that it is called by the natives " a little duck of an island -- would not be a bad spot for Mr. Disraeli to erect his new grand agricultural scheme upon. As this scheme is to relieve the landed interest, what land in the whole of England can be in greater need of relief than an island which is in such an unsettled state, that it is continually rising and falling, and is sometimes so depressed that it runs away, and nothing is seen of it for days? Besides, as the island went, according to its habit, to the bottom, how triumphantly Mr. Disraeli could point to the perfect success of his new Sinking Fund! And more than this, how valuable such a floating capital would be to a politician, like Disraeli, who is always shifting his ground!



So what have we today?

The title of The Floating Island in Derwentwater: Its History and Mystery (1888) could have been shortened, as by 1888, the island posed little mystery. Guidebooks would continue to tout the "floating island," but not an item of wonder. The nearby Windermere Boutique Hotel, for example, includes within "20 Fun facts about the Lake District,"

Derwentwater has a floating island that sporadically appears towards the end of summer. It consists of a mass of vegetable matter that rises to the surface on a cushion of methane gas.

Whether or not this is a "fun fact" perhaps depends on the reader's idea of "fun."

Today, in fact, there's less to discuss, the lakeshore bog having encroached into the region of the historic island. Bookkeeping of emergences appears to have been discontinued, perhaps due to the realization that such determination is subjective. At what degree does biomass floating in the south-east corner of Derwent Lake constitute an "island?"

A visit by Chet Van Duzer, compiler of Floating Islands: A Global Bibliography (2004), brings us up to date.

A marshy, irregularly-shaped island which certainly seemed to be the floating island; comparison of this image with a postcard image taken from the "Surprise View" confirmed that ordinarily there is no island in this location. The position of the island also agreed quite well with that indicated for the floating island in 1884 in the map in G. J. Symons' The Floating Island in Derwentwater (1888).

The island was quite low in the water, perhaps partly because the day was cold and rainy, which would decrease the size of the bubbles suspended in the island's soil and thus its buoyancy. The uneven surface of the island rose just a few centimeters above the water, and was muddy with a growth of low grassy vegetation;; there were some rocks and sticks on the island, and while we were visiting it first a duck and later some geese grazed on the island. The edges of the island slope very gradually away under the water, and to approach close to the island we had to run the canoe aground on it. When we touched part of the island beneath the water with our paddles bubbles of gas rose to the surface. We were able to paddle across the narrow area between the two largest parts of the island without any difficulty; I landed on the island twice. The surface of the island seemed to sink slightly during the time I stood upon it, but as the soil was quite spongy it is difficult to be certain that my feet were not merely sinking deeper into the soil.



Northern portion of the floating islands



Southern part of the floating islands



Floating islands, the light patches



Van Duzer standing on a floating island

The world's best documented floating island is that of Derwentwater. But as Norman Nicholson reflects in The Lakers (1955), the island's legacy is far more than chronology, data and explanation.

For the majority it rose and fell only in imagination, drawing about it all the mists and mystery of all those strange islands that float through the legend and history of the world, from Circe's Isle to Prospero's, from the Isles of the Blest to Juan Fernandez. To them it was a magic island, an island of fancy.

Lake Orion, Michigan

The "mystery" of a floating island was by no means confined to the Lake District. From "A Floating Island, One of the Mysteries of a Michigan Lake," Milwaukee Sentinel, October 3, 1897,

C. Henri Leonard, a cottager at Orion Lake, writes to The Detroit Journal concerning the mysterious "sinking Island" in the lake there. Mr. Leonard says he has personal knowledge of the island in question which is about an acre in extent, and has watched its disappearance and reappearance with much interest. At the opening of the season at Orion this year the island was about four feet under water. When Mr. Leonard left his cottage on Sept. 7, the island had begun to emerge from the water and he says it will soon be dry enough to allow one to wall: over it with safety.

The island appears to be of a spongy texture and contains several stumps of trees a foot or more in diameter. Mr. Leonard says no one has yet fathomed the mystery or the regular disappearance and reappearance of the island but he has a theory.

Unlike Derwentwater, stumps -- probably due to their root wads -- lodged in the buoyant vegetation caused the formation to feel more substantial.

In the center of the island a half-dozen or more large stumps are growing, a clump of three being in the center of the mass. I think: these stumps are in great measure responsible for the phenomenon attending to its annual sinking and rising. That is, I am of the opinion that a collection of these originally formed the nucleus for the growth of this strange freak among the islands of our freshwater lakes.

The flora of the lake is something marvelous in its richness and variety. These stumps have drifted out to the center of this portion of the lake, and taken with them some of the strands of the long, stake-like plants that grow there to a length of nearly 10 feet, with the lily fronds, mosses, and various others of the aquatic plants.

These floating growths have formed there, with the earth attached to the stump roots, an island garden all to themselves. They grew luxuriantly, and the underbrush cleared away from the shores and other islands thereabouts gradually drifted into them, and so increased the size of the mass; then, as the wood of the brush and of the stumps decayed, the mass became water-logged, and the whole gradually sunk beneath the surface.

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Suggested causes of the Michigan island were much the same as those hypothesized for Derwentwater. Methanogenesis was the prime (and correct) possibility

But how comes it to rise again, as does each succeeding year? This is the point that has puzzled wiser heads than mine, but I have a theory for it which seems to answer all the requirements. As the flora ripens during the hot months of summer, for the island is a thick mass of vegetation. the stems enlarge, become buoyant, and, as the season advances toward September, undergo the first stages of decay -- that is the stems become filled with the gases attendant upon fuller ripeness and commencing decay; this large mass of gas-enclosing vegetation overcomes the natural weight of the mass, the specific gravity being only a little heavier than the water, and so the whole mass gradually rises above the water's surface. It stays in this condition above the surface till the heavy frosts of the fall occur, when, the plants having been destroyed, and decay measurably completed, the whole mass being heavier than the water again, it gradually sinks to the bottom of the lake, which is about 30 feet deep at this point, to arise again the following year, when spring and summer have brought the lake's flora into life and full vigor once more.

Or was a tributary stream involved?

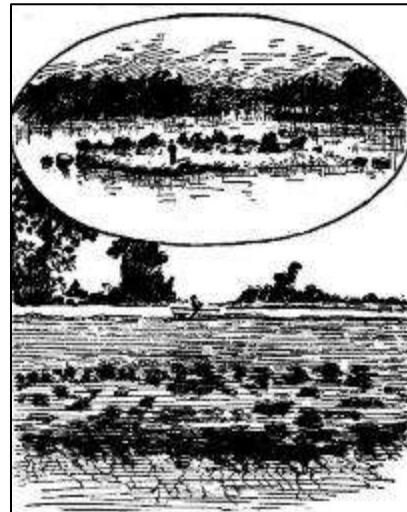
These lakes are fed by large springs entering in at various places along the bottom, and it is my belief that a large one is located under this "sinking island" and that the upward current from this source also helps the vegetation in the raising of the island from the lake's bed during the late summer months.

Regarding root-connectivity,

It seems to change its position but very little, the wind blowing across the surface having little or no effect upon it in this respect. This leads me to think it is anchored by the long- rooted and tentacled weeds that luxuriate to about and upon the unstable mass.

"A Sinking Island," Lima Daily News, January 8, 1898, from which the illustration to the right is taken, adds,

The venerated Baron Munchausen [Chapter 10] is the reputed discoverer of the first floating island. The stories that sailors have told of these moving eases of verdure in the ocean have always been incredulously received. But here in the United States is the fact that seeing is believing.



From "Mysterious Floating Island Rises to Surface of Lake Orion Every Summer and Sinks from Sight in Winter," Los Angeles Times, August 22, 1909,

On one occasion a number of farmers and teamsters resolved to put the island out of the floating business. In their efforts to do so they hauled many loads of stone and deposited them on it during the early part of the winter, believing that when it went down in February it would go down for good, weighted as it was with the stones. But the following August saw it bob up serenely from below -- minus its load of stones.

At another time an effort was made to keep it on the surface and it was chained to the surrounding country with heavy log chains. When it's time for departure came, it departed -- and the log chains departed with it. The surrounding country to which it was chained was saved, but the log chains were never recovered.

The island is composed of soft mud and rushes, and there are some skeptical souls who attribute its formation and appearance and disappearance to the gathering or vegetation in one

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spot by the currents of the lake and its subsequent decay. The majority, however, believe that the island is the abode of the spirit of some antediluvian monster who comes to the surface annually to keep track of the progress of the world from which he long ago departed.

Powers (1914) presents a scientific assessment.

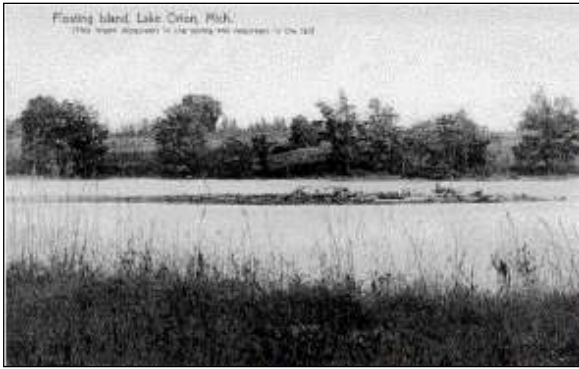
The composition of the peaty island was determined by eight borings made on and around it. The island was at the time about 6 inches above water level. The stumps and logs at the surface are underlain by a layer of heavy woody peat six to nine feet in thickness which is usually free from gas. Below this is a thinner stratum of light watery peat from which the gas bubbles up in quantities as the rod is pushed down, even when the holes are made close together. The total thickness of the island varies from ten to thirteen feet.

Under the island is a layer of pond-formed, structureless peat at a depth of about 18 to 20 feet. This material has a thickness of at least 5 feet, but the borings were stopped at a depth of 24 feet.

On the north side the slope of the island to the bottom of the lake is steeper than elsewhere and consequently the waves have washed the soft peat away. The turf is held together by roots of larches, spruces and shrubs, the exposed parts of which are incrustated with marl. The exposed surface of the island is sufficiently firm to stand on, being 6 inches above water in the highest places with stumps extending two feet above water.

On the west side of the island is a cove formed by the action of waves on the peat. Only the lighter material has been removed, the stumps and roots of the large shrubs and coniferous trees remaining in place.

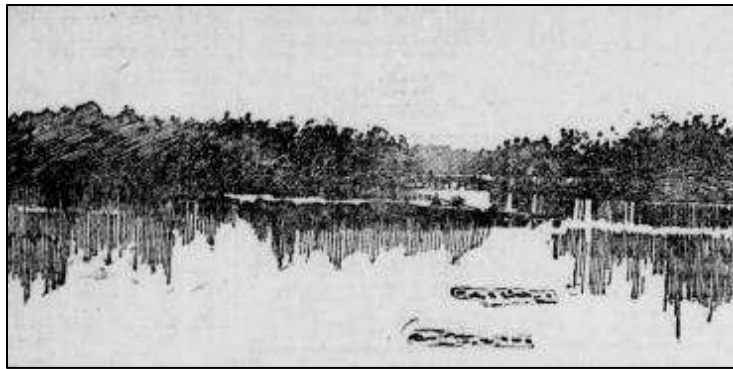
The history of the lake may be traced out from the nature of the layers of peat. The original lake was small and on the bottom of it accumulated about 6 feet of soft, structureless material derived largely from spore and algal remains. While this was building, the larger water plants, especially Potamogeton and the water lilies, formed a constantly increasing percentage of the upper layers of the deposit. As this material accumulated and approached the water surface, the shore plants, but especially the amphibious sedges, grew out over it. Carex filiformis is the most common mat builder in the Great Lakes region and very likely was a factor here. There is always a well-marked separation plane between peat of subaqueous and that of subaerial origin, in any deposit containing both. The peat of the mat is more buoyant by nature and vastly more coherent than that below it, so that the upper material would easily cleave away from the lower. After the sedge mat had grown thick enough to permanently emerge from the water, sphagnum, then shrubs, then coniferous trees would establish themselves upon it. As the deeper parts of the lake filled, the mat would encroach on the newly formed shallows. Towards the end of the process of filling, the mat-forming sedges might cover the water and eventually form a turf over an unfilled body of water. Then the invasion of trees would follow as fast as the relation of the water level to the surface of the deposit would permit. In boring through the mat watery places were noted which may represent watery holes in the original mat.



Postcard, c. 1920. *Floating Island, Lake Orion, Mich.* (The island appears in the spring and disappears in the fall.)



1913, a week after the island first appeared above the surface.



"Lake Mystery Revived When Floating Island Rises," Orion Weekly Review, September 4, 1952, brings us somewhat up to date.

Visitors to Lake Orion and the townspeople again have the opportunity to observe the curious phenomena known as the Floating Island which has made its appearance, in the usual place just south of Park Island bridge about 150 feet from the shore, during the past week.

Made famous in years past by scientists and geologists who came to study the formation, it also attained mention and acclaim in Bob Ripley's "Believe It or Not."

Composed of mucky soil and dotted with stumps of large trees, it rises from the lake bed to form an island of some 800 by 1000 feet when fully above the surface. Approach to the island is dangerous to boats because of the slowly rising mass and profuse underwater vegetation.

Records of earlier years on the lake show that this island made an appearance each year in the summer months and at times was covered with vegetation. Since the early twenties it has risen as frequently and is seen now about every ten years. Last records are from 1942 when about 100 feet was visible above the surface.

The lake at the present time is quite high, which may furnish the buoyancy necessary to cause the mass to appear. Lowering of the water is planned for about September 15 for repair of docks and breakwaters and the island will probably disappear about that time. The present area is about 200 square feet. It seems to be composed of clay and muck, very sticky in consistency. The surface is sunbaked and seems hard enough to support considerable weight. Tree stumps, tin cans, water buckets, parts of rowboats and dried weeds are in evidence.

Since its first appearance this phenomenon has been a mystery which defies conclusive explanation. The lake at this particular point is quite deep at times and at others quite shallow.

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Some credit a large spring beneath the surface which is acting intermittent periods, but this is only a guess, no record of any such spring is available. Meanwhile, the curiosity provides food for speculation and an attraction to visitors from all over the State.

Whitehall Reservoir, Massachusetts.

Supplying Boston, Whitehall Reservoir has an area of 600 acres. A dam built before 1846 raised the water 8 feet, turning a large area of lowland into a bog of domed vegetative mats, some of which have turned into permanently-floating islands.



As the larches are 30 feet in height, this floating island isn't periodic.

Periodic islands appear during the summer, sometimes rising and sinking a number of times, and disappear in autumn. Some islands have the appearance of mud-banks on which no plants grow. Others float for long enough to become overgrown.



To the right, several periodic islands rising, June, 1912.

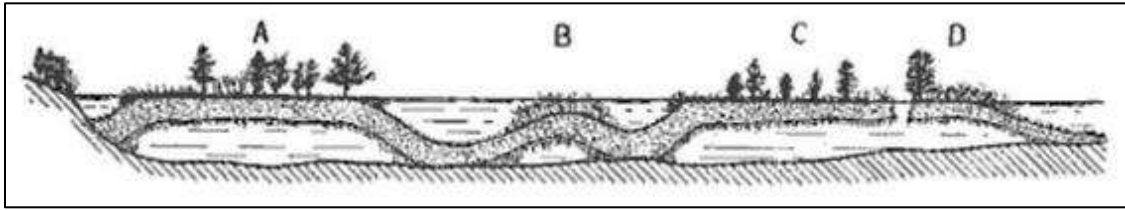
As reported by Powers (1914),

The difference in composition of the peat in the original bogs appears to be the principal factor which controlled the formation of periodic or floating islands. When the mat was attached to the bottom, it could not rise; where it was not firmly attached it could rise if it were lighter than the body of water displaced. In some places the mat consisted of heavy, woody peat, and in other places of light mossy peat. The former would only come to the surface if buoyed up by gas and living vegetation, or simply by marsh gas. The specific gravity of air-free sphagnum peat, which is but slightly decomposed, is 1.765.

Consequently the specific gravity of woody peat must be about 1.9 to 2.0. As in the case of the island of Derwentwater, these periodic islands rise when sufficient gas is developed by bacterial action, and sink when the gas escapes more readily than it is formed.

As the water level rose about eight feet when the dam was built, the islands must rise through nearly eight feet of water. In order to do this a periodic island must stretch about one foot in

every twenty-five feet of length, under the conditions shown in the cross-section of the lake. Cross-section of a portion of Whitehall Pond



Vertical scale, 12 x horizontal. Permanently floating islands, A, C and D; periodic island, B. This mat grew in a horizontal position and parts of it rose with the flooding of the bog. Floating islands C and D are separated by a crack.

Poland

"Kingdom of Poland. Republic of Cracow," Universal Geography 113 (1829) by Conrad Malte-Brun,

Floating islands are not uncommon; the Poles call them the "plica of the lakes"; they consist indeed of the tissues of roots and plants attached in a manner not unlike the plica of the hairs and some appear and disappear regularly at certain seasons.

As Malte-Brun doesn't specify which plica have islands that "appear and disappear regularly at certain seasons," we'll take the liberty of illustrating a few Polish possibilities.



Tobolinka



Druzno



Zakret



Oświn



Mazurian

Sweden

Since 1696, when the first recording was made, to 1893, the periodic island of Lake Ralangen has appeared at least 33 times, 9 times in the month of August, 14 in September, 4 in October and once in July. In the other cases, the notes simply indicate autumn.

The longest emergence was in 1855, when it remained up until spring of the following year. In 1893, the uplift occurred in July and in December the island was on the ice. The shortest showing itself was for one week in October 1758,

In An Account of Ireland, Statistical and Political (1812), Edward Wakefield draws from Torbern Bergman's Physical Description of the Earth (1766)

Bergman speaks of a floating island in the lake of Ralangen in Sweden, known under the name of Rodholm. It was visible in the years 1696, 1727, 1733, 1743, 1750, 1757, 1758, and 1766. During the above course of years, it appeared only twice in the month of August, but never before the 13th; six times in September, and twice in the beginning of October. It again sunk down in September, October, and sometimes in the beginning of November, appearing, on some occasions, not longer than ten days, as in 1758. In the year 1747 it was visible from the 17th of August to the 21st of October, consequently remained at the surface sixty days, which is the longest period of its appearance known.

It contained sixty old stumps, twenty-six of which had at that time been taken away.

Subsequent authors also refer to counts of "stubbarnes," which is rendered into "stump" in translation, erroneously conveying a picture of a cut forest. "Snag" or "stubble" might be a better translation.

In the year 1766, the day after it sunk down, that is, on the 4th of November, it stood at the depth of about eighteen inches below the surface. This island was one hundred feet in length, and from twenty to thirty in breadth; it always appears in a part of the lake where the surrounding water is deep. The wind does not seem to have any considerable influence over it, for it appeared during a strong wind on the 3rd of October, 1757, and sunk again on the 19th during a wind of the same kind. No account can be given of the manner in which it was separated from the land.

Four papers in Kungliga Vetenskapsakademien (Royal Swedish Academy of Sciences) renewed interest the subject.

S. Ljungqvist, "Berattelse till Kongl. Svenska Wettenskamps Akademien om en Flot-oo," 1747

Fredrik Wrangel, "Berattelse om Fiotton i sjon Ralangen" 1748

H. Ljungquist, "Utdrag. Utur Kongl. Vetenskaps Academiens Dagbok, Samt inkomne Bref och handlingar. Ar 1751," 1751

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G.E. Pasch, "Berattelse om en flytande holme, kallad Rorholmen eller Floton, uti sjon Ralangen i Jonkopings lan, Linkopings stift, norra Wedbo harad och Marbecks socken," 1815

Universal Geography, or A Description of All the Parts of the World on a New Plan, According to the Great Natural Divisions of the Globe (1827) by Conrad Malte-Brun, and repeated in A Treatise on Physical Geography: Comprising Hydrology, Geognosy, Geology, Meteorology, Botany, Zoology, and Anthropology (1851) by A. Barrington

There are some floating islands which appear and disappear alternately. The lake Ralang, in Smaland, a province of Sweden, encloses a floating island, which, from 1696 to 1766 has shown itself ten times, generally in the months of September and October. It is 280 feet long, and 220 broad. There is an island similar to it in Ostrogothland.

Analyses of gasses leaving the floating peat, percent.

1858					
HCO ₃	N ₂	CH ₄	H ₂	O ₂	CO
6.3	43.2	49.6	0.9	0.0	0.0
1894					
CO ₂	N ₂	CH ₄	H ₂	O ₂	CO
1.7	22.2	61.2	11.1	1.2	2.6
2.0	28.0	57.8	8.0	1.7	2.6
1.6	27.7	57.5	9.2	1.3	2.6

In a different vein, Robert Sieger, in "Flottholmen i sjon Ralangen och Vattenstandets Oscillationer," Geologiska Foreningens i Stockholm Forhandlingar 16.3 (1894), remarks that locals believe that the rising of the island presages unrest or war. A similar superstition was associated with a lake near Nossan in Vastergothland/ Alvsborgs which Carl Linnaeus mentions in Wastgota-resa, pa Riksens Hogloflige Standers Befallning (1746) where the movement of a floating island with birch trees was believed to portend a period of unrest.

In "Om flottholmens i sjon Ralangen Uppkomst" Geologiska Foreningens i Stockholm Forhandlingar 16.5 (1894), C.A. Lindvall notes that the root-bound island has not appreciably decreased in size in two centuries. The formation did not sink if the weather were humid, since no cracks were formed in the surface through which the gas could escape.

Victor Oberg, "Flottholmen i sjon Ralangen," Geologiska Foreningens i Stockholm Forhandlingar 16.2 (1894) is particularly informative.

At the southern extremity of Lake Ralangen, located within Marbacks parish of Jönköping County, there is an island, who for more than two centuries been familiar to the strange circumstances that, it sometimes shows afloat and others are sunk below the surface.

The island is formed of pine stumps, whose roots give uplift to the core, of which the island is chiefly composed. The gap between the roots are filled with a well decomposed peat of composition firmer enough that the crust cannot be lightly pierced with a stick. The island may be entered without applied boards and without sinking under the weight of several people. Digging found the solid crust thickness to be from 3 meters in the northwest to 4.5 meters in the east. Beneath it was water to a depth of about 2 meters The island's beaches are steep in all directions with the exception of the east, where the islet gently slopes,

The period during which the island has remained unseen is also very variable, from one to twenty-three years. It was not seen during the years 1801-1824, nor during the years 1840-1855

As the island can to be raised and lowered, it must be free from a lower fixed bottom. But then it must be something that keeps it firmly in place, so that he does not wander with the wind. It is by tree roots, that the islet is detained.

A strong underground springs which is suggested as cause for the island's raise, could well raise and lower the lake's water level but not lift the island.

Prof. E.C. Pasch, who in 1815 at the king's commandment visited with the intention to investigate the relationship, did not pursue further studies, inasmuch as the islet did not rise during his visit, but based on interviews with the local population, suggests that the cause of ascent and descent is as follows. During dry weather, the reduced the water in the lake makes the sunken island closer to the lake's surface; then when a storm into hits, especially northern one, it lifts islet by the movement of the water. The roots bind the island support it in position for some time, preventing it from falling back. According to Pasch, the island would the island be formed where the Svartån outlet in Ralangen divides into two arms.

- 1. Low water. The island consists of a fork to the east attached to the bottom of the lake. If the water level is high, the fork cannot raise the water level.*
- 2. Strong wind. The emerging movement due to wind may act more forcefully under water than on top, lifting up the islet.*
- 3. Gasses. Both within solid mass and under the existing cavity is the formation of gases which can be noted when a cane or rod pierces the crust. A lively effervescence results. This gas mass is probably large enough at low water when the water had been put in stronger motion by the wind to raise the islet and keep it afloat. As support for this, I would emphasize that when the island declines, according to my observations, gases are not formed in such abundance as when I first (in the beginning of September) arrived on the scene. In addition, the island decline was preceded by rupture of its mass, releasing gas probably entrained.*

The gas is odorless and colorless, and has been investigation by the leraned Stockholm University. Miss N. Sahlbom, who executed the analysis, has left the following message. "The gas consists principally of marsh gas and nitrogen. Moreover be minor amounts of hydrogen, oxygen, carbon dioxide and carbon monoxide."

Entries in the parish register Marbacks found remarked that in 1773 east of this floating islet arose another island, which had never before been seen, of about 50 meter length and a few meters wide with 100 old stumps. This island sank gradually down before the regular floating island. According to the local population, another islet sometimes arises in Ralagen at the same time the main islet appear and disappear.

South of the islet there is also another small island which shows the same phenomenon of rising and falling. Of these three islands, I have only been in a position to investigate the latter, inasmuch as they both rest not been visible when I visited the area. This island, which consists of peat, has a superficial area of only one square meter; water depth all around is 1.5 meters. Stumps were not there before. The island is quite securely attached to the bottom.

From Karl Baedeker's Norway and Sweden: Handbook for Travellers,

Lake Ralangen, which contains floating islands -- 1882 edition

Lake Ralangen (530 ft.), with its "floating island" visible only in dry summers -- 1903 edition

Lake Ralangen (532 ft.), with its 'floating island', visible in dry summers only -- 1912 edition

In Fornsjostudier inom Stangons och Svartans vattenomrdden (1917), Uno Sundelin notes the intermittent floating islands in both Lake Ralangen and Lake Sommen, where "flottholme" rise to the surface in the autumn, without breaking free from peat on the bottom, the peat being sufficiently strong and flexible as to just bend up to the surface.

Nearby Lake Nimmern is mentioned by Lars Justelius as having islands in "Berattelse om holmen som upflutit i sion Nimmern i Oppeby socken," Kunliga Vetenskapsakademien (1750). Sundelin notes that Lake Nimmen has a "flottholme" that generally stayed above water 10 to 12 weeks each autumn. Below the "flottholme" was a water-filled cavity, 1 to 2 meters high.

Today, however, like Lake Ralangen, Lake Nimmern is free of a memorable floating feature.



1926



Today



1894



Today

Brasil

"Matupá" is a local term in the Brazilian Amazon for freely-floating islands of vegetation growing on blocks of soil that can exceed 3 meters in thickness. Sizes range from a few square meters to several hectares.



Matupás in Amanã Sustainable Development Reserve (RDSA)

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Floating blocks of grasses become inundated during the flood season and thus "sit down," submerging to the bottom and dying. During the dry season, these blocks of "rotten grasses" float back to the surface, providing a substrate of partially decomposed organic matter on which diverse plant species establish themselves. The cycle can repeat itself over the course of successive rainy and dry seasons.

According to a local, as documented in "The Floating Forest: Traditional Knowledge and Use of Matupá Vegetation Islands by Riverine Peoples of the Central Amazon," *PLOS ONE* 10:4, April 2, 2015, by C.T. de Freitas, G.H. Shepard, Jr, and M.T.F. Piedade,

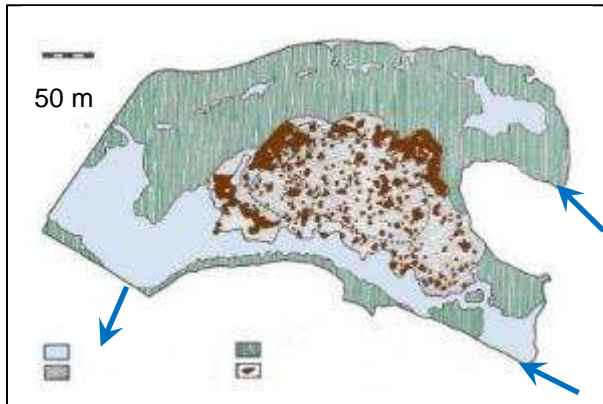
"It dies, it lives, dies, lives. And when you think it's gone, there it is again, fully formed."

A distinction is made by local people between mats of floating vegetation and true matupás. The former lacks soil substrate, making it possible to ride over in a canoe. Matupás, on the other hand, have a firm, earth-like structure, in many cases solid enough to walk upon.

Japan

Mizorogaike Pond is a warm 9.8-hectare waterbody with an unconsolidated peat floating occupying about one-third of the area. The mat is composed of hummocks and a flat area, the latter usually flooded except in midsummer. The hummocks, isolated from each other, are "habitat-islands" recognized according to their size and developmental. Some 50 flowering plant species, mostly bog-specific plants and colonists from elsewhere, inhabit the hummocks. The raft undergoes an annual cycle of emergence and submergence, rising July when it may float over 20-100 centimeters of free water, and sinking in December.

As the peat accumulates above the surface and submergence decreases, the successional sequence is *Menyanthes* → *Rhynchospora fauriei* → *Eriocaulon sikokianum* → *Sphagnum cuspidatum*.



Summary

Our rising and sinking floating islands demonstrate differences. Some simply bob with the water level. Others are constrained in vertical mobility by rooted anchors.

Of the periodic islands, those in which the accumulation of decompositional gasses varies with the season (and thus, of more complex buoyant behavior) the Derwentwater peat formation has long aroused acute scientific curiosity. The Michigan example, on the other hand, has at times included more-substantial woody material, the "stumps" being derived from collapsed bank. The Massachusetts reports include both peaty bed material floated to the reservoir surface, and derivative now-treed buoyant formations no longer bobbing.

CHAPTER 49

SAIL THE SEVEN SEAS

While the expansive scope of the "seven seas" has been enunciated for more than 4000 years, the specification of which seven has expanded exploration. We needn't quibble about which to count, however, as islands have been observed floating on virtually all of the world's oceans. We'll list six, the seven being polar waters where the floating islands are icebergs, the subject of Chapter 60.

As we brave the waves, our watch will be vigilant to avoid running aground on islands our charts deny.

South China Sea

Alexander Hamilton's "Account of the East Indies," A General Collection of... Voyages and Travels, Digested by J. Pinkerton (1811),

The natives report, that at a certain season of the year, after the south-west monsoons are set in, they can discern an high mountainous land to the southward of them, and continues in sight from December to the latter end of February, or the beginning of March, and then disappears. If the report be true, it must be some FLOATING ISLAND that comes from and goes to New Holland, which is the next tract of land to the south of Timor.

Alto Vela Jack's "Remarks on the Reports of Mariners Respecting Oceanic Dangers," United Service Journal and Naval and Military Magazine, November, 1830, mentions floating islands sighted among the Moluccas.

The account is here given, and appears to have been written by the captain of an India ship: -- "I have several times passed near to pieces of wreck, which probably would have proved fatal had we stricken against them in a dark night."

Many pieces of wreck or drifts have also given rise to imaginary dangers; this I have several times experienced, and I shall mention one instance which happened to myself when among the Molucca Islands, returning from China by the eastern passage.

We there fell in with a ship, the commander of which I knew to be a steady intelligent man, who informed us, that on the preceding day he had passed under the lee of several small islands covered with trees, and having white sandy beaches. I assured him he was deceived, for with an adverse wind we had at that time, and also on a former voyage, traversed all the places he mentioned, and if there had been a single rock a few feet above water, it could not have escaped notice.

He said he could not be mistaken, as he had passed within two miles of these islands at mid-day, and would immediately swear to their existence if necessary. Nevertheless, he was deceived, and I knew he had mistaken large drifts for islands, as the drifts are often of considerable extent, and formed of trees of the Mangrove kind, interwoven with underwood, and much soil torn away from the low banks of rivers by the torrents brought down by the heavy rains. By the tenacity of the soil adhering to the drifts, the trees and shrubs which form them receive nourishment, and continue their verdure for a considerable time, whilst the exterior sides being exposed to the washing of the sea and the rays of the sun, speedily get a white aspect from the water's edge to a small distance upwards, giving that part the appearance of a sandy beach.

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A word of warning in time of war,

Another commander, who is a friend of mine, saw one of these large drifts in the evening, about sunset, and having mistaken it for an enemy's ship, he altered his course after dark to avoid it, by which his ship grounded on a shoal, and was nearly lost.

"Floating Islands," Honolulu Republican, September 5, 1901, reports an incident from 1861.

The German bark Australia, from Samarang to Singapore observed an island right ahead, just where the navigating charts indicated clear water on every hand. Nor had any such danger been noticed there by the master of the bark on previous voyages, although directly on the track followed by sailing vessels. She stood boldly onward, and, when quite close thereto, this vigia was distinctly made out by all hands to be a floating island, well wooded. Erect upon it were very many trees in full foliage, a large number of other trees lying flat on the soil and stumps of rotten tree trunks in abundance.

In Life in the Forests of the Far East, or Travels in Northern Borneo (1863), Spenser St. John speaks of finding a floating island between Sarawak and Sadong with a man who had lived on it many days.

During our passage we observed some of those floating islands which wander over the face of the waters, at the mercy of wind and wave. I remember once that the signal man gave notice that a three-masted vessel was ahead, and as at sea the slightest incident awakens interest we all fixed our telescopes on her. As we steamed on our mistake was soon discovered; it was a floating island, with unusually tall nipa palms upon it that were bending gracefully before the breeze.

Our people once found at sea a man making one of these his resting-place. Doubtless he abandoned his island home cheerfully, though he fell into the hands of enemies. He told us that his pirate companions, in hurried flight, had left him on the bank of a hostile river, and so seeing a diminutive island floating seaward he swam off, got upon it, and he had been there many days, living upon the fruit he had found on the palm stems. Another was seen as it floated towards the sea by a pirate marooned on a riverbank in hostile territory; he swam to it and remained adrift for several days, subsisting on palm fruits.

Frederick Boyle, Adventures among the Dyaks of Borneo (1865) mentions an encounter with a floating island while sailing along the northern coast of Borneo.

The same day we saw a floating island; this phenomenon is not uncommon in tropical latitudes, and its principle of locomotion is found to be simple enough when properly investigated. Some giant tree upon a river bank is carried away by a sudden inundation and floats upright out to sea, supported by the mass of earth in the clasp of its wide-spread roots. When the soil melts away, the tree is subverted with a crash, the island disappears, and a naked log drifts to and fro upon the waves.

Chapter 30 describes the pumice islands created by the Krakatau eruption of 1883. K.W. Dammennan's The Fauna of Krakatau 1883-1933 (1948), on the other hand, discusses the island's more-common coastal erosion.

Sometimes whole islands with trees still erect are met with and other growths such as nipa palms and clumps of bamboo, while whole chunks washed off from the coast, river-banks or mangroves may be found floating out to sea.

To these Indonesian reports, we have Captain Jonas Pendlebury's 1924 sighting off the coast of Borneo, but he's worth his own chapter, Chapter 50.

"Floating Islands," Our Paper, October 29, 1904, describes an encounter in the Philippines.

About three years ago, off the south coast of Luzon, the U.S. warship Zafiro passed a drifting island with trees erect, and the Manila, near Mindanao, saw many small floating islands well

out to sea. One of the most remarkable specimens of these drifting masses, originally doubtless forming parts of the bank of a river, was that tracked from point to point by the hydrographic office at Washington on the monthly series of pilot charts of the North Atlantic, which are so well known to navigators of every maritime nation.

Some few years ago the British warship *Zephyr*, near the strait of Sunda, sighted what appeared to be an island that was not marked on the chart by which she was navigated. The vessel was steered for the unexpected danger, which, on close inspection, proved to be a huge piece of the bank of some river in the vicinity that had drifted seaward with several large trees growing upon it.

Last May, on the equator, between Borneo and Sumatra, the steamer *Lord Roberts* passed three floating islands -- one large and two small. The largest of the three was about 600 feet long and 200 feet wide, and upon it were five large trees in full growth. The two small islands each carried a number of banana palms, and all three looked quite green and inviting as the steamer passed close to them.

Carl Aslakson, "The Floating Islands of Northern Borneo," Earth Measurer, The Autobiography of Carl Ingman Aslakson (1980), referring to 1927,

While in the Sulu area we coaled ship at Sandakan, Borneo. It was an overnight trip from our working grounds to Sandakan. One night I was standing a bridge watch and enjoying the full moon which was out which allowed some visibility. I was sure of my position because I had been taking bearings on a lighthouse on the Borneo coast. Suddenly a small island loomed up dead ahead which had a few palm trees on it. I was frightened and ordered full right and full astern. Then I stopped the ship and sent for the Captain, he took one look with his binoculars and said, "Oh that's one of those floating island that you find off the Borneo coast."

It seems that near the mouth of a jungle river off the north coast of Borneo, driftwood and logs near shore often get bound together, vines and vegetation will rot and form a sort of soil, and finally new vegetation will start growing on the mass. Sometimes often years later, during the rainy season one of these masses will break away and float out to sea. It is a very solid mass and could damage a ship hitting it and I was right in avoiding it, but I would have appreciated it if the Captain had warned me about them in advance.

As noted by C.O. Darlington in Zoogeography: the Geographical Distribution of Animals (1957), floating islands tend to be understandably associated with tropical regions.

Most accounts of natural rafts come from tropical latitudes. This is probably because it is mainly there that vegetation develops a very large biomass in humid environments where violent flooding can occasionally do substantial damage, tearing free large fragments of vegetation which might be floated to the sea. Furthermore, tropical vegetation includes some particularly buoyant, large plants such as nipa palms in the Sunda-Sabul [Indonesia] region and bamboos more generally in warm regions, both being specifically mentioned in some accounts of large natural rafts.

If news reporting can be taken as a measure of incidence, Indonesia seems far and away to have more than its quota of such islands.

Indian Ocean

"Did early Hominids Cross Sea Gaps on Natural Rafts?" asks Jeremy Smith in Faunal and Floral Migration and Evolution in SE Asia-Australasia (2001).

A raft was recorded near Aldabra (Indian Ocean) ... as "a half-submerged bamboo thicket carrying live fauna (e.g. crabs) accompanied by a large area of floating and submerged flotsam." This floating bamboo island almost certainly came from either Madagascar or the East African coast and must have drifted at least 400 km before being observed. It was too large to be towed ashore by motorboat despite attempts to do so

Pacific

"Run Down by an Island," Woodland Daily Democrat, August 20, 1892, describes a floating island that had been inhabited, though we don't know if it was prior to the island's embarkation.

Captain George W Torrey, of the fishing schooner Alice reported that his boat was almost run down by a floating island in the Pacific Ocean off Cape Flattery. The captain and crew went on it and made partial exploration. There was a hut and a small farm on the inland and other signs of habitation, although there were no signs of life.

"Stops Ship in Sea to Get Big Fight News," Syracuse Daily Journal, October 17, 1910, refers to the Johnson-Jeffries fight and the sailing ship Atlas after rounding the Horn.

Second Mate J.D. Kelly was on watch, when early in the morning the watch sighted land on the port bow. He knew that no land was charted, and was puzzled. The cry of land brought all hands on deck and we made out about two miles to port, a low-lying island. It was about between half a mile and a mile in length, and a little less than half a mile across. Many trees were growing on it, and birds were seen in the branches when we got closer; also monkeys.

The fact that the land was not on the chart, although in the track of many vessels, caused great wonder. The trees and their inhabitants precluded the possibility of its being of volcanic origin. This led the skipper to announce his belief that it was a floating island, and such later it proved to be.

Another report of the same sighting, "Floating Island Found," Holbrook News. January 6, 1911,

Queer Discovery Made by the Crew of the Bark Atlas in the Pacific Ocean. The crew of the bark Atlas, which arrived in Seattle recently after rounding the Horn from Philadelphia, reports a queer discovery for one day of the 138 of her voyage. She had been out many days without seeing anything only three ships were seen on the entire trip when one morning in the Pacific the lookout reported that he had sighted land off the port bow where no land was supposed to be. Nor could any be found on the charts. It seemed low in the water, but too much like the real thing to be a mirage, so the captain ran toward it. It proved to be land, right enough; an island covered with trees and thick low underbrush. Birds and a few monkeys were seen upon it, but no other signs of life. These precluded the possibility of the island being of volcanic origin, and leads the captain to claim it as a floating island. He believes that it was washed out to sea from delta of the Rio de la Plata, or the Negro, and that the undergrowth was so thick that, its roots held the whole together. As he saw two trees tumble into the water from the island's edge before he sailed away his theory appears to be somewhat substantiated.

"Reports Floating Island in the Pacific," La Porte Progress Review, October 9, 1930, notes a floating island seen in by Captain J.O. Evans of the British steamer Pareora.

"It was on April 15, at noon, that we discovered the "floating island." It was in the Pacific near the Society islands," said Evans.

"There were no signs of human life, but there were great flocks of birds swarming over the place. There must have been a thousand birds at least in the flock we saw. We did not get close to the island because we did not know how deep the water might be. The island appeared to be just a few feet above the water. In some places it seemed as if the water had been breaking over its shore"

From "Tree-Clad Floating Isle Drifts in South Pacific, Menacing Ships," New York Times, October 26, 1932,

Sea captains were warned by the Hydrographic Office today officers of the Steel Voyager had sighted a "floating island about a half-acre in extend" 1,300 miles south of San Diego.

The wandering isle, hydrographers said, was crowned by trees twenty feet high.

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"Floating Island Reported," Binghamton Press, October 12, 1933,

The local branch of the government hydrographic service is checking a new freak of the ocean. The Mexican steamship Korlqan III reported passing a floating island about 20 miles south of Cape Corrientes.

"Floating Isles Seen," Oakland Tribune, October 10, 1939, recounts the American-Hawaiian freighter *Virginian* sighting "a large number" of floating islands 100 miles off the coast between Acapulco and Salma Cruz.

*For the first time in several years, the floating islands off the Mexican West Coast have made their appearances again. According to a radio message received yesterday by Captain J.J. London in charge of the San Francisco branch of the Hydrographic Office, from Captain R.A. Oliver of the American Hawaiian freighter *Virginian*, a large number were sighted 100 miles off the Mexican coast between Acapulco and Salma Cruz... According to Captain Oliver, the resent group consisted of areas 30 to 50 feet in size.*

Caribbean



Caribbean, 1999

From the Daily Picayune, July 17, 1861,

*Captain Simpson of the brig *Bird of the Wave*, of Boston, from Port au Prince, states that he saw a floating island, circular in form, about eighty feet in diameter and twenty feet high, with several trees on it. He saw it ... at latitude 29° 59' north, and longitude 73° 51' west, and passed within too hundred feet of it.*

"A Floating Island," Washington Post, November 8, 1908, a report of an American cruiser north of Honduras,

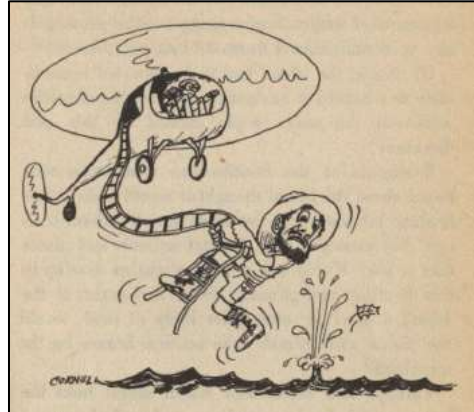
It proved to be a little island about three quarters of a mile around and a quarter wide. In shape it was long and narrow, with a thick growth of vines and bushes reaching down to the water's very edge. Three tall coconut palms grew in the middle of it. No life of any kind was on the island, nor was there any water, though instead of being sandy or rocky as such islands usually are, the soil was rich, dark and very moist. After gathering the cocoanuts the sailors returned to the cruiser, which, oddly enough, seemed much further off, and considerably more to the southwest than when they left her. Then it just dawned on them that they had been visiting one of the floating islands so often heard about but seldom seen in the South Atlantic. Further observation confirmed the suspicion, as the cruiser remained near it long enough to see the island change its position.

"Floating Island," [Smithsonian Institution Center for Short-Lived Phenomena](#), (1969) describes an island tracked for 10 days and 200 kilometers, about 60 miles south of Guantanamo Bay

The Navy Lookout on the destroyer escort John D. Pearce couldn't believe his eyes.

Out there, in the middle of the Windward Passage, half-way between Cuba and Haiti and 60 miles from any land, a tiny island was rotating along at two and a half knots.

Floating islands have been part of sea lore since the Phoenicians first sailed out into the Atlantic.



Some of the legends have a basis in truth, for large chunks of coastline do often break loose and drift out to sea. The matted undergrowth and roots help hold the soil together and keep it afloat.

The 15-yard-long island spotted by the escort ship was covered with a bushy mangrove-like growth. It also sprouted about a dozen 35-foot palm trees.

Of course, the island had to be reported immediately as a hazard to navigation. But naval authorities were not the only people excited by this odd discovery.

Ecologists at the Smithsonian Institution who heard about the island thought it would make a fine floating laboratory to test some theories about ecology. For example, how do land animals and plants fare at sea? Would new ecological chains develop in this floating environment? Most important, if the island docked at some other body of land, would the plants and animals take up new homes on the mainland?

Perhaps this mysterious island might hold the key to explaining how various species of plants and animals had been scattered around the world.

Seeking answers to these and other questions, a team of scientists rushed from Washington to the U.S. Naval Base at Guantanamo Bay, Cuba, to catch a special island-hunting helicopter.

After catching up with the floating island, the scientists hoped to lower themselves by rope ladder to make on-the-spot investigations and gather samples of the flora and fauna. Later, they'd keep track of the island's drifting, mark its possible landfall, and monitor any cross-cultivation between the island and its new home.

Unfortunately, floating islands prefer to remain mysteries -- a part of the ocean mythology with mermaids and sea monsters.

Even before the scientists boarded their helicopter the island sank unseen and unmarked somewhere south of Cuba. Any secrets it might have revealed went with it to the bottom of the Caribbean.

North Atlantic

Christopher Columbus sailed in quest of fixed lands, not floating ones, but had Columbus encountered the latter, he'd not have been surprised. Included among his sailors was William Irez of Galway, and as we note in Chapter 80, an Irishman would have been familiar with tales of Hy-Brasil.

Ferdinand Colon's History of the Life and Actions of Admiral Christopher Colon (1571) notes his father's recollection of Antonio Leme's tale of a 1476 Atlantic voyage in which Leme saw three islands. Fernando mentions the tree-root hypothesis of Pliny, Seneca's report of lightweight stone floating off India and stories St. Brendan's Isle (Chapter 3).

Perhaps they were some of those floating islands that are carried about by the water, called by the sailors Aguadas, whereof Pliny makes mention in the first book, chap. 97, of his Natural History, where he says, that in the northern parts the sea discovered some spots of land, on which there are trees of deep roots, which parcels of land are carried about like floats or islands upon the water. Seneca undertaking to give a natural reason why there are such sorts of islands says in his third book, that it is the nature of certain spongy and light rocks, so that the islands made of them in India, swim upon the water. So that were it never so true, that the said Anthony Leme had seen some island, the admiral was of opinion, it could be no other than one of them, such as those called of St. Brandam are supposed to be, where many wonders are reported to have been seen.

"Et Inventio Fortunata" relates that there is an account of two islands towards the west, and a little southward than the island of Cape Verde, which skim along upon the water."

Unfortunately no "Et Inventio Fortunata" exists today in the Colombina Library at Seville, the library of Ferdinand. Some take the reference to be the 6th-century poet Venantius Fortunatus, and an argument might be made for Fortunatus, a German proto-novel about a legendary hero popular in 15th-century, but neither source, as we have them today, describes skimming islands.

The entry for March 8, 1718, in Daniel Defoe: His Life and Recently Discovered Writings Extending from 1716 to 1729 (1869), describes a sighting apparently not far south from Gibraltar.

A Floating Island

Two or three remarkable pieces of news will entertain our renders this week from abroad, tho' they do not relate to politics. The first is brought from Gibraltar in Spain, whence they tell us, that a Master of a Bark, which came in there from the coast of Barbary, reports, and all his ship's crew confirm it, that they encounter'd at sea a strange thing, perhaps not to be parallel'd in the world, viz. a large Island which floated in the sea. This island, by the description the sailors give of it, (if they did not see double,) must be several leagues in circumference; it had in it mountains, valleys, woods, and plains; and that which is very particular in it is that they heard hideous noises in it of the roaring of wild and ravenous beasts, such as lions, panthers, tigers, wolves, and the like, who made a most horrible and frightful roaring and howling, which they supposed to be occasioned by the sense they had of the danger they were in. The ship's crew, who give this relation, tell the people at Gibraltar that being at an anchor, they were most horribly frighted, seeing this Island come on upon them with the flux of the sea, and that they were obliged to weigh their anchor immediately, and put themselves under sail to get clear of it.

The best account they can give of this is, that it must be some promontory of land, which standing far into the sea had been broken off by an earthquake, and was thus separated; but how they can account for its motion in the sea is very difficult, as it would be, without doubt, to prove that it floated in the sea, which we must confess seems something more than unnatural. The people at Gibraltar were so possess'd of the truth of this story, that they fitted out two vessels immediately, with many people, whose curiosity led them out to see the thing, and who went out at the Straight's mouth in quest of them, but could find nothing of it, nor indeed can it yet obtain upon the belief of the world, that such a thing could be, at least that it could be as they described it, unless the land, which as they suppose must by the force of some Earthquake be broken from the mainland, and the Earth being still in motion underneath, might possibly lift it up, where the water was shallow, but must, when it came into deeper water, sink, and be lost in the sea.

"Telegrams in Brief," Rochester Democrat and Chronicle, February 2, 1890

The captain of the Steamer Mineola, which arrived at Philadelphia from Hamburg Wednesday, reports having passed a floating island 700 feet high and a mile long.

"Marine Monsters. The Story Told By a Veracious Sea Captain," East Hampton Star, July 26, 1890,

Captain Gheen, of the Schooner Abby Gheen, now lying at Bulson streen wharf, Camden, saw strange things off Capt Hatteras on his voyage to this port. The captain is a man whose veracity is not to be doubted. The captain brought his vessel from Rio de Janiero, and it was when twentv miles off Cape Hatteras that he ran into a school of sea monsters such as he had never before seen.

The monsters were sighted by one of the crew. They were nearly a hundred yards ahead of the vessel and were apparently rushing toward her. When first seen by the sailors they thought the ship was running into a floating island, some of which are often seen at sea. They soon changed their minds, however, when they got closer and saw a school of big fish that so one on board could recognize as having seen before. The school opened to let the ship pass, and then at once closed in and followed her.

Sightings in 1892.

From "A Floating Island," the Kingston, Jamaica Daily Gleaner, December 10, 1892,

The Pilot Chart of the North Atlantic Ocean, published by the Hydrographic Office at Washington... contains information of startling interest with respect to a floating island. The reports received indicate the drift from some portion of the coast of the American continent to mid-ocean of a mass of forest growth that resembles a floating island... Unless broken up and scattered by a storm, it may soon be sighted along the steam route, between the 20th and 30th meridian, and eventually drifting ashore on the coast of Europe.

Of interest are the descriptions of the individual sightings

*A piece of forest (floating island) covering a quarter of an acre, topmost blanches reaching at least 10 feet above sea level, visible about sown miles
A mass of reed standing straight up, nearly 30 feet high.
A small floating island of bamboo, about 30 feet in diameter, and 20 to 30 feet high
A clump of bamboos about 80 feet in diameter and 20 feet high.*

The droll reporter concludes.

I have not yet beard of any of the West India Colonies having lost an island.

From "A Floating Island Seen," Daily Picayune, September 18, 1892,

A most remarkable and instructive drift has been reported to the hydrographic office of the navy department. Several reports of it from various vessels have been received, the first being from Captain Freeman of the British steamship Blue Jacket about the latter part of last July.

This report states that the Blue Jacket had sighted a float island greatly resembling a piece of forest, covering about a quarter of an acre, the topmost branches reaching about 30 feet above the sea level, and visible for a distance of about seven miles.

Its position when sighted was about 300 miles south of Halifax and about 420 miles east by south from Now York.

A later report from the captain of the Italian steamship Lotimbro showed that it had sighted the same moss, and it looked like a "mass of reeds standing straight out, nearly 30 feet high."

Chapter 49 -- Sail the Seven Seas

The last report received was from the British steamship Roman Prince and the captain of that vessel in his report likens the curious mass to "a small floating island of bamboo, about 20 feet in diameter and 20 to 30 feet tall.

The report of the captain of the latter vessel shows that he had sighted the island a month later than the Blue Jacket, and during that comparatively short period it had drifted no less than 325 miles in an east-northeasterly direction.

The hydrographic office believes it is now about fifty or sixty miles south of the east-bound steamship route, but it is not believed that the drift will reach far enough north to be sighted by any of the regular liners, though it is quite likely it will be seen by some of the tramp steamships or sailing vessels from the Mediterranean.

That's 1868 kilometers in 52 days, roughly 1.5 kilometers/hour. The Gulf Stream flows at as much as 9 kilometers/hour off the United States seaboard, slowing to about 1.6 kilometers/hour as it widens to the north.



Sightings in 1893.

A fairly similar set of observations were noted in the following year, as summarized by Cyrus Adams' "Drifting Over the Sea," Current Literature 30.2, February, 1901,

In 1893 there is proof that a bit of land torn from some coast or river bank and crowned with vegetable, if not with animal matter, drifted half way across the ocean. This remarkable mass was first seen in the Gulf Stream off the coast of Florida, and its size was stated to have been two acres, but this may have been exaggerated. It was seen again once in the longitude of the Bermudas and the latitude of Wilmington, Del.

It was then in the center of the Gulf Stream. The mass was lifted above the general level in one part until the bushes that crowned it were 30 feet above the sea. It was then in plain view at a distance of seven miles. When it was seen at this time, it measured about 110 feet on each side. It was seen again a month afterward, a little north of the latitude of Boston. Two weeks later two vessels came upon the traveler from the tropics and it was having a hard time. The floating mass, however, was not entirely destroyed, for it was seen again with a few days, and it is probable that the October storms finally tore it to pieces.

It is believed that it came from the Orinoco River, and it is known to have traveled 1,075 miles, and its total journey might have been at least twice that distance.

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"Floating Islands," Christian Advocate, June 26, 1902, provides another account of the 1893 occurrence.

The longest voyage of a floating island, according to government records, took place in 1893. This island was first seen off Florida, and apparently it had an area of two acres. It bore no trees, but it was thickly covered with bushes, and in one place it was 30 feet high above the sea level. It was in the Gulf Stream, traveling slowly and with occasional undulations to show where the ground swell was working beneath it. Probably it got away from its river anchorage in the spring of the year, for toward the latter part of July it had reached the latitude of Wilmington, Del.

By the end of August it had passed Capo Cod and was veering toward the Grand Banks. It followed the steamer lane routes quite accurately, and several vessels reported it.

One month later it was in mid-ocean, northwest of the Azores, and its voyage evidently was beginning to toll on it. It was much smaller and less compact. It was not seen again.

To the right, the approximate route. Working with what was suggested in its day, the island seems to have been moving at about 1 kilometer/hour, reasonably in accord with the estimate for the case a year earlier.



Sightings in 1902.

A floating island near the Bahamas made news in 1902. From "Floating Caribbean Islands," Brownsville Daily Herald, July 18, 1902,

The Norwegian steamer Donald, from Banes with fruit has arrived here, and Capt. Warnecke told this remarkable tale:

"We were two days out from Banes and about thirty miles from Watlin's island, in the Caribbean sea, when we came upon a floating island. I with the mates and several of the crew rowed toward it. Thousands of little monkeys scampered all about the shore and when we were in range they began a bombardment by hurling coconuts at us. We captured two monkeys. The following day we discovered another floating island and landed. This time we were greeted by a covey of parrots of most brilliant plumage."

The captain was not a geologist, however.

Captain Warnecke declared that the eruption in Martinique had shaken up the entire district, and the small pieces of land had become separated from some uninhabited island.

From "Birds and Animals Adrift," The Daily Chief, July 15, 1902,

"On passing Watlin's Island, which lay off about 48 km," said Skipper Warnecke, "we steamed close to a floating island. Upon it were what appeared to be a large number of stately palm trees. I had never encountered anything like this before. The floating island was moving, and that, too, at a slow rate. Curious for a thorough investigation, I steamed still closer to the object, and was amazed to find what I took to be palm trees were full-grown coconut trees, and laden with fruit of the largest kind. Then I ordered a boat lowered and, together with the first mate, made a landing on the still moving island."

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Then another surprise awaited us. High up in the trees was a small colony of mischievous monkeys, and as we got nearer they shied a number of cocoanuts at us. After a lot of trouble we secured two of the attacking simians and at least a dozen cocoanuts. Then we took to our boats, boarded the steamer, ordered full steam ahead, and soon the strange floating island was lost in haze.

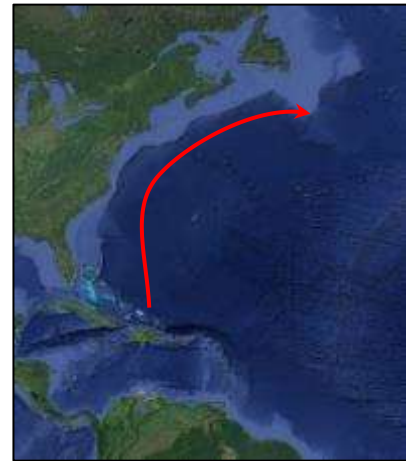
But another surprise was in store for us the following day, when we passed within glass sight of another singular floating object just off the port bow. The lookout sung out "Land ahead."

This amazed me, for I knew according to the chart land was not miles near. Still, curious from the previous day's experience, I determined to solve this further mystery of the sea, so I gave orders for the ship to steam close to what I now made out to be another floating island. Again I had a boat lowered, and with the same crew we landed on the island.

We found it to be an exact duplicate of the day before, with an exception --instead of monkeys we found a big covey of parrots of most brilliant plumage. Among them was one who was evidently the patriarch of the tribe, and I do not exaggerate when I say that the aged fellow could cuss in two languages. He was evidently a lost pet. We took him and a couple of his fellows aboard the steamer, and soon left the floating island in the distance."

"Floating Islands," Our Paper, October 29, 1904, provides a few more details.

On July 26, 1902, the steamer Blue Jacket sighted a floating island, covering a quarter of an acre, the topmost branches of the trees being at least 30 feet above the level of the sea, when about 450 miles due east of New York. A fortnight later it was observed in almost the same position; on Aug. 26, 500 miles east of Boston, the Roman Prince sighted it much diminished in size, being then only about 20 feet square, and it was last reported by the Ebro, on Sept. 19, 800 miles east of Halifax, N.S.



Any number of single-sightings along the Gulf Stream suggest that such island travels aren't rare occurrences.

"Tree in Mid-Ocean," Fort Wayne Gazelle, May 22, 1896, reports on a 25 foot tree, fresh and green and apparently of tropical origin, found 500 miles northwest of the Azores.

The island may have started from one of the Bahamas. Perhaps it floated from the Amazon in a freshet that broke it loose, and drifted out into the Atlantic. There it may have been borne north, northeast and east in the Gulf Stream, until it became disintegrated under the battering force of the seas created by the February gales

"Passed Floating Island," Trenton Times, August 2, 1906, describes a steamship passing a floating island some 20 miles off Cape Hatteras.

The Arapahoe was a day out of Charleston on July 31 and was on the edge of the Gulf Stream about twenty miles southwest by south of the Diamond Shoals lightship, when at 6:30 A.M. the officer in charge of the deck saw a group of about a dozen trees on the starboard bow. They were about a mile away and appeared to be a variety of bamboo. They stood out of the water twenty feet.

"Floating Islands at Sea," Brandon Weekly Sun, November 1, 1906, offers another account, one involving a bording.

The stories occasionally brought ashore by seamen of floating islands are usually set down as myths, yet the report from the steamer Arapahoe of meeting a floating island in the Gulf Stream off the coast of North Carolina cannot be dismissed so easily. As a matter of fact, this vessel not only saw a floating island covering over two acres of ground, but the second lieutenant and a boat crew of sailors actually went on the island and spent several hours on this piece of floating land.

The story is that this floating island originally was broken off the shore of New Guinea, just at the top of South America, and it was carried by the Gulf Stream along its usual course. If the island keeps together it should eventually go ashore near the Scottish coast.

Probably the big storms in mid-ocean will not leave much of the island. It is described as 20 feet through along the edges and much heavier at the side, probably where it was torn off from the mainland.

As a matter of fact, no floating island larger than a few acres of bog land torn away from the coast has ever been seen by responsible witnesses. Even these quickly disappear under the action of the great ocean tempests, which even crumble up the rock-bound coasts of the continents. This island reported by the officers of the steamer Arapahoe is the biggest one ever trodden by human foot, and was a real marine marvel.

Julius Chambers adds to the sighting a forewarning of global climate change in "Walks and Talks," Brooklyn Daily Eagle, August 3, 1906.

The floating island, with its palms, now in the Gulf Stream, ought to be towed into the-Great South Bay and anchored on ground in which the fine trees would again take root and flourish. This suggestion on my part is prompted by sentiment. As I once remarked in this column, Professor John Tyndall, when in this country many years ago, declared that the day would soon come "in which palm trees would grow upon the south shore of Long Island."

"A Floating Island off Palm Beach," Philadelphia Inquirer, October 30, 1917.

Deep sea fishermen report that they recently saw a floating island in the Gulf Stream off Palm Beach. The island was about twenty-five feet in diameter and the fishermen say it was composed of marl and muck held together by tangled roots and rotted seaweed; that there were several trees and mangrove sprouts growing luxuriantly on the island. The fishermen landed on the island and found thousands of small fish on it which birds were greedily eating.

"Brand-New Fish Story," Gettysburg Times, November 6, 1918, takes place in Florida.

Deep-sea fishermen report they recently saw a floating island in the Gulf Stream east of Palm Beach, Florida. The island was twenty-five feet in diameter and the fishermen say it was composed of marl and muck, held together by tangled roots and rotted seaweed, that there were several trees and mangrove sprouts growing luxuriantly on the island. The fishermen landed on the island and found thousands of small fish on it, which sea birds were greedily eating;

South Atlantic

Whereas numerous West African rivers discharge into the Atlantic, the River Congo garners the most awe in regard to floating islands. Chapter 40 draws together reports that somewhat trace the ominous upriver journey of Joseph Conrad's Heart of Darkness (1899). This chapter contains references related to Congo-borne floating islands dispersed into the South Atlantic.

A Voyage to Suratt, in the Year 1689, (1696), by John Ovington,

A floating Island washed from the shore, sailed by our ship, extended about an hundred foot in length and breadth, overspread with grass of three foot height, though it grew so near the line. We judged it was born down by the River Zaire into the sea.

Abbe Proyart's Histoire de Loango, Kakongo, et Autres Royaumes d'Afrique (1776) mentions a floating island off the Congo coast.

The Captain permitted us to put out a boat, in order to examine it. It was about 120 feet in length, and consisted of reeds, resembling the Donax, and a species of Agroatis, among which were still growing some branches of Justicia, and in the midst of these were seen a number of animals.

The journal of Captain Scobell, H.M.S. *Thais*, 1813, notes that at 30 or 40 miles from coast,

I met several floating islands or broken masses from the banks of that noble river, which, with the trees still erect, and the whole wafting to the motion of the sea, rushed far into the ocean, and formed a novel prospect even to persons accustomed to the phenomena of the waters."

In the same period, H.M.S. *Amelia*, anchored in 15 fathoms, 12 miles from the South Point, observed large floating islands covered with trees and bushes torn from inland banks by the violent current.

"Sketches in South Africa-Number Four," The Knickerbocker; or New York Monthly Magazine 38.6 (December 1851) by Montgomery Parker, reports floating islands seen as far as 150 miles from the river mouth.

From James Tuckey's Narrative of an Expedition to Explore the River Zaire, Usually Called the Congo, in South Africa, in 1816 (1818),

Small islands have in many places been formed by the current, and doubtless in the rainy season, when the stream is at its maximum, these islands may be entirely separated from the banks, and the entwined roots keeping the trees together, they will float down the river, and merit the name of floating islands. At this season however, they are reduced to occasional patches of a few yards of brush wood, or reeds, which, gliding gently down the stream, convey the idea of repose rather than the rush of a mighty river.

From The West Coast of Africa: Cape Lopez to the Cape of Good Hope, H.O. 48, translated from French sailing directions by J. R. Bartlett, United States. Hydrographic Office (1877),

From the great inclination of the sides of the river-bed, the volume of water flows out in an unbroken stream, with a velocity varying from 4 to 8 miles an hour, and forms no delta; but the course of the main body is indicated by floating islands, consisting of bamboo and debris of all kinds, which are met with far out at sea. These floating masses are sometimes so compact that it is impossible for a vessel to make headway through them without the assistance of a fresh breeze. The floating islands of the Congo are frequently carried as far N. as Cape Lopez, and the coast from Kabenda is strewn with marshy debris from the river.

The rainy season in the Congo generally begins early in November and continues until the middle of April, and the rising of the river generally occurs about six weeks after its commencement, when it rises 9 feet above its ordinary level. The stream at this time is very rapid, and bears along the floating islands, some of which are more than 100 yards in length, and are frequently dangerous to ships under way, but especially so to those at anchor.

The article then notes Commander Richards' observation of 1864:

I have seen grass islands, perfectly green and fresh, off Anno Bom Island. [approximately 220 miles west of Gabon.]

"Floating Islands," Honolulu Republican, September 5, 1901, provides another Congo account.

In September, 1860, HMS Ranger, then commanded by Captain. H.R. Wratislaw, R.N., when some 70 miles west of the mouth of the River Congo, passed quite close to a drifting island of considerable dimensions, which had apparently been borne seaward by wind and current from the African coast. Quite naturally, the navigating officer imagined an uncharted danger had been discovered, until accurate bearings of the object clearly showed that it was adrift. Upon this floating island were two tall trees and several bushes, but not the least sign of human beings or habitation could be discerned.

And from the same article.

A few weeks ago the Union-Castle liner Arundel Castle, when about 150 miles west of Nienos river, west coast of Africa, fell in with a floating island. 40 feet long by 20 feet wide, upon which were some trees 10 feet high. Occasionally, many miles remote from the land, whether in the shape of continent or island, with nothing in sight save sea and sky, the crews and passengers of ships are afforded food for reflection and a relief from misanthropical monotony by the unexpected appearance of a floating island above the horizon, and it may fairly be assumed that in a few instances, these precarious portions of the nearest continent have served as abiding places for unfortunate natives.

Journal of Francis Gregory Dallas, December 3, 1858, Naval History Society 8 (1917),

At 5:30 got underway and into the Congo River for Shark's Point. At 8.10 anchored in 12 fathoms. A strong current of about five. At 10:55 AM stood in with the sea breeze. At 11.50 anchored in 8-1/2 fathoms, Shark's Point distant 3 miles; furled sails. The Congo reminds me of some of our own large rivers, sweeps into the Atlantic with a heavy current carrying with it large floating islands of grass, trees, bamboo, etc., which are sometimes met over a hundred miles at sea.

A Speculation Regarding Dates

One cannot help but notice that the bulk of these accounts derive from years long past. Two explanations seem possible.

1. That for some geologic or oceanographic reason, portions of land are today less likely to float to sea.
2. That today's periodicals consider such reports to be less newsworthy.

We suspect the latter.

CHAPTER 50

ENJOY THE CAPTAIN'S YARN

For the purposes of documentation, Capt. Jonas Pendlebury is but one of a long list of sea captains who've sighted shore-line real estate torn adrift by angry waters and soon to sink. Chapter 49 cites dozens of such sightings, dutifully recorded in ships' logs and deemed by news reporters worth a few column inches.

But Pendlebury was a renowned story teller. When the Captain hit port, the first reporter to buy the skipper a drink was likely to be rewarded with a yarn suitable for the next day's edition.



One of the floating islands Captain Jonas Pendlebury sighted in the Palawan Passage between the Philippines and Borneo. -- "The Land Came Out to Meet Him," The Bee, July 9, 1924.

The President Adams, 10,495 tons, built in 1921.

"Floating Islands Followed His Ship like a Dog, This Skipper Relates," Tipton Tribune, May 26, 1924, illustrates.

Floating islands, one of which consisted of seven acres and followed his ship like a pet whale, were seen off Borneo by Captain Jonas Pendlebury of the Dollar Line steamship President Adams which docked yesterday at Pier 15, Staten Island, after her round-the- world cruise.

It was Captain Pendlebury's first experience with floating islands, save in the form of dessert, and he has been a seafarer for thirty-six years. But, floating islands are not the rarest things in the world, according to members of the staff of the American Geographical Society, who explained yesterday that they have been sighted as far as fifty miles out from the mainlands from which they became detached.

"It was our good fortune that we started through the passage in the daytime," said Captain Pendlebury, who impressed ship news reporters with the importance of getting his first name. Jonas, and not Jonah. "I was on the bridge when I heard the call, 'Land right ahead, sir."

"I at first thought our charts must be imperfect, as they sometimes are in those remote seas, because they showed no land at that point. I changed the course of the ship and slowed down. But the land kept getting closer and closer. It was then I observed that the island was floating. It came within forty feet of the President Adams and followed her for a considerable distance.

"We proceeded cautiously through the passage the rest of that day and before night we sighted eight or ten more floating islands, but none so large as the first one. We also passed a series of water-spouts, but they were not large enough to do any damage.

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"Reports Floating Islands: Skipper of President Adams, Back from World Trip, Tells of Strange Phenomenon and Waterspouts," Los Angeles Times, May 23, 1924, an "Exclusive: Dispatch."

Let it be said in form of introduction that Capt. Jonas Pendlebury, veteran skipper of the Dollar Line steamship President Adams is a skipper of the old school, a muster of truth and veracity whose yarns of the sea have never been questioned.

Today, Captain Pendlebury berthed his ship at Staten Island after a voyage of 30,000 or more miles over a hither and thither route circumnavigating the globe.

"Ah ha, you want a story," sensed the skipper, as several ship reporters boarded his craft at quarantine. "Come up in the chartroom and I will tell you where, when and what," said the captain, his eyes gleaming.

And snubbing off the end of a marlinspike with his teeth, this was the lay of the ancient mariner.

"The chart put us in the Palawan passage of the northern end of the Island of Palawan. The chart gave us plenty of water and plenty of room, but as sure as you are sitting there, my boy, what do you think was dead ahead -- eight floating islands, the largest more than seven acres. I knew it would not be Palabangan Island or again Sampanmangio point near at hand.

"My navigating officer and myself checked our position and we and the chart were all O.K., but there were the dinged old inlands dead ahead. I brought the Adams to a stop to make sure it was not an optical illusion, that it was us and not the islands that were moving but when we drew a line on them with an instrument, they were all eight moving right at us.

"It was a ticklish moment, my boys, and the engines were clamped down to more headway. And the Adams just picked her way through the torturous channel indicated on the chart. Still the islands came to us. We passed one less than fifty feet to starboard. Coconut palms nearly 100 feet high grew on them and thousands of monkeys screaming and chattering heaved coconuts at us. Brilliantly plumed birds soared about the Adams. I was certainly relieved when we got from that floating mass -- I'll report them to the hydrographic office."

So sayeth the skipper of the good ship President. Adams and as has been noted, he is a skipper of the old school, the ultimate of voracity.

"Floating Islands, Monkey Laden and Adrift in the Pacific," Hawera & Normanby Star, August 22, 1924,

"They were there and they floated and they had coconut trees and monkeys in the trees were harvesting the nuts for a hard winter," declared pretty Miss Margetta De Meglio, one of the many tourists who saw the islands. "The monkeys were throwing the cocoanuts to the ground, but as the ship stood off some distance we were in no danger of a bombardment. We counted fourteen islands, all in one group, ranging in size, according to the captain, who made a careful observation of them, from seven acres down. There were several of three or four acres. The largest one had a hill on it, shown by the photographs."

This is the explanation of the floating islands as set forth by scientists, who say that similar phenomena have been reported by deep-sea skippers of many years ago. Currents in the great rivers of Western Asia undercut and separate from shore huge slices of tropical jungle, the heavy, far-reaching roots of the trees and dense vegetation binding the "islands" together and holding considerable quantities of soil as they are carried out to sea for hundreds of miles

Kansas City Star, October 15, 1926

Another extraordinary tale brought back by one of these round-the-world liners is the story of the floating islands.

When Captain Jonas Pendlebury of the President Adams brought his ship into harbor a while ago, he astonished listeners by narrating that while he was taking his ship through the Palawan Passage, which he described as a "cut" in the Pacific Ocean between Borneo and the Malay Peninsula, he ran into a whole school of floating islands.

"I was on the bridge myself," he said, "when I heard the cry of 'Land-ho!' from the look-out man. There was no land on the chart within miles of us, so I looked up in surprise. What was my amazement to discover at least six floating islands. The biggest of them was about seven acres in extent. On it was a cluster of palm trees from the tops of which a number of chattering monkeys threw' down coconuts at us as we passed close to it."



MONKEYS THREW COCONUTS FROM FLOATING ISLANDS.

Enter P.T. Barnum

Hawera & Normanby Star, August 22, 1924.

Borneo, the mysterious island continent lying between Southern Asia and Australia, and, according to the late P. T. Barnum, the original habitat of the famous "Wild Man," has produced another marvel, a real one, fourteen of them, in fact. Floating Islands!

Recent telegraphic advices from the Ear East, reporting the existence of the nomadic isles, wandering about in the Oriental Pacific, bearing lofty cocoanut palm trees and the palm trees currying hordes of chattering monkeys were received with some skepticism in scientific circles, and less cultured commentators voiced :an opinion that the glasses the islands were seen through were gin tumblers.

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"Floating Islands off Borneo Coast May be New Home of 'Wild Man'," Plattsburgh Republican, September 29, 1924

The mystery of the disappearance of the "Wild Man of Borneo" may be solved by the discovery of a group of floating islands off the coast of that distant land by Capitan Jonas Pendlebury of the Dollar liner, President Adams, on his first voyage in the new around the world service. Eight of these floating islands were encountered on the Palawan passage, north of Borneo. The largest of the islands, Capitan Pendlebury reported, was about seven acres in area, and the palm trees, 100 feet high, were filled with chattering monkeys at the passengers on the American liner.

The "Wild Men of Borneo" was the stage name of two midget strongmen, pictured to the right, who performed for Barnum's circus.



Newsmen appeared to have more fun in those days, as evidenced by the following.

"Attacked by Floating Isles: Skipper Tells of Hair-Raising Experience When Ship Was Saved Only by Weird Apes Fanning Selves in Lofty Trees and Giving Breeze That Blew Liner to Safety," Los Angeles Times, June 17, 1924.

The Dollar liner President Adams arrived at Los Angeles Harbor yesterday morning from n trip around the world on which she experienced a most extraordinary adventure for which her captain, Jonas Pendlebury, is authority. The President Adams on April 17 last, while in the Palawan Passage south of the Philippines and north or Borneo was attacked by eight floating islands populated with vast swarms of monkeys.

Capt. Pendlebury, who is as master of fact, a Yankee skipper as ever skipped, declares the yarn is a fact. .As substantiating evidence he referred to the quartermaster; who was asleep at the time

On the morning of April 11. In clear weather, the President Adams found herself surrounded by the eight floating islands. As soon as daylight broke, a terrible chattering attracted the attention of the watch. The islands were near the ship and on all sides and the order was given to stop the propellers because at first it was supposed that the Islands were regular, that is stationary ones.

On the islands were many palm trees which were burdened with the weight of the monkeys, who numbered, according to the quartermaster's calculations. 550. The monkeys made a terrible racket chattering and they shook their hands at the steamship in a most threatening manner. Soon they began throwing cocoanuts, some of which struck the side of the vessel, but did no more damage than to amuse some of the hands below dock.

In the meantime, the captain had determined that the ship was on her course and that there were no islands rimmed in the locality. He was about to give an order to proceed on the course and if necessary run down one of the islands when the monkeys the Islands by this time had floated nearer-tore palms from the trees und began fanning themselves furiously, for the tropical sun was well up. This fanning, Capt. Pendlebury declares, produced such a wind that the ship listed to one side and then the other and was blown clear of the islands. .The gale, however, appeared to increase and huge seas were produced which tossed the President Adams about like a peanut shell in a flooded gutter. But all speed was employed and the ship soon was traveling in placid seas with the Islands mere specks in the distance.

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Capt. Pendlebury says the monkeys were of a variety he never has-seen or heard of. They were ns large as apes but had long tails, which when they were not employing them otherwise, were curled over their heads with the tips resting on their noses. They were of a peculiar green color, blending with the color of the tropical vegetation of the islands, so that they could not be distinguished except at close range.

Capt. Pendlebury regrets that the excitement was such that he neglected to cast an anchor on one of the islands and tow it into Los Angeles Harbor. Ho believes mu the green monkeys of the floating islands of the Pacific would be as great a scientific curiosity as the recently discovered blond Indians of Panama or the pink jackrabbits of the Patagonian pampas.

"Captain Jonas Tells One," Kansas City Star, May 31, 1924.

New York Hears of Floating Islands Inhabited by Fanning Monkeys

Capt. Jonas Pendlebury of the Dollar liner President Adams told a stirring tale of the sea when his ship docked in Hoboken recently, completing a voyage around the world. According to Captain Pendlebury the ship was attacked by eight islands and five hundred monkeys. Never in his thirty-six years of experience with islands and monkeys had he seen anything like it.

It was off the west coast of the Philippines early in the morning. Captain Pendlebury was snoozing in his bunk. Suddenly he was awakened by a tumult of chattering. He rushed to the bridge and looked, rubbed his eyes, and looked again.

The ship was surrounded by floating islands. Tall palm trees and tropical vegetation grew -upon the islands, and monkeys clung to the trees like barnacles, screeching and chattering. The captain was amazed. Here were n squad of islands in a place where there should be no islands. Here were monkeys where there should be nothing but fish.

The captain was still nonplussed when the monkeys began tearing the cocoanuts from the --. No, let's be accurate about this thing. The monkeys began tearing palms from the palm trees, and set about using them as fans, so that the combined breeze made by the five hundred monkeys on the eight Islands blew the President Adams out and away. As soon as his ship was clear of the Islands, Captain Pendlebury made a point of commanding full speed ahead.

The whole affair was so full of menace and excitement that Captain Pendlebury did not have time to chart the location of the islands. Captain Pendlebury's first name is Jonas, not Jonah. We must be accurate about this.

Other Pendlebury News

Floating islands aside, if Pendlebury was involved, there was likely a story.

Stork Arrival. New York Tribune, December 12, 1921.

Baby Born After Stork Takes Refuge on Liner. Centennial State Unfriendly to Bird, but Welcomes Wee Girl Arrival in Cabin.

Captain Jonas Pendlebury of the steamship Centennial State, which arrived yesterday from London, is convinced that there is something in the traditional responsibility of the stork.

"We left London ten days ago," said Captain Pendlebury, "and while coming down the Thames. in the vicinity of the Downs, a stork flew aboard the ship, alighting on the forecastle head. John L. Bebee, my chief officer, ran down from the bridge where we were standing and chased the bird into the forecastle, with the idea of capturing and stuffing it. The bird, however, crawled through a porthole and escaped.

"In less than a half hour Dr. W.S. Erwin was called to the cabin of Mr. and Mrs. James Rasely. Not long after Erwin emerged smiling. 'It's a girl,' he announced."

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Mustache Woes. "Where, Oh Were, Are the Whiskers on that Braved Sea?" Washington Herald, November 8, 1922

Captain Jonas Pendlebury of the S.S. President Adams once attempted a mustache, but it grew like a huge fence, and when his friends began sending him mustache cups on anniversaries, he decided to cut it off.

Prohibition Problems. "Britain Bars Clearance of Dry. U.S. Ship," New York Tribune, October 25, 1922.

President Adams is First Boat to Face Paw Requiring Gallon of Brandy for Each 100 Persons.

Captain Jones Pendlebury, of the President Adams, says that he was notified by radio to unload all his liquor stores while he was preparing to clear the Tilbury docks in London. He unloaded 4,868 bottles of assorted liquors and 116 cases of ale while hands on adjoining steamships played dirges and while the bartender of the President Adams wept.

Captain Pendlebury was congratulating himself for a duty well done when he applied to the British Board of Trade for clearance papers. He had but a short while to make his clearance according to schedule. He was asked if he had not unloaded all of his liquor stores, and he replied that he had, whereupon orders of the British government were issued to him to reload one gallon of brandy for each 100 passengers according to British law. Unless this was done, Captain Pendlebury was informed, clearance papers could not be issued under the British law.

The President Adams had booked 231 passenger and the skipper had no time to argue the matter nor to radio his own government for advice. . "I will load two gallons of brandy," he said to the Bond of Trade executive, "for it's imperative that I clear port."

"No," the executive is quoted as replying, "you will load five gallons of brandy, as you will need this to comply with British law on your return voyage and you cannot legally purchase the brandy in an American port."

Captain Pendlebury loaded the five gallons of brandy as ordered. His clearance papers were then issued and the President Adams arrived yesterday with the brandy under lock and key and intact. It had not been seized or ordered removed from the ship up to last night.

More Prohibition Problems. "Prescribed Whiskey Lacking, U.S. Captain Dies at Sea," Evening Telegram, January 9, 1923

Chief Officer of American Freighter Hatteras, Forbidden by Law to Carry Liquor, Which Two Physicians Advise by Wireless, Succumbs to Pneumonia.

Captain Jonas Pendlebury of the steamship President Adams, which arrived at Hoboken today from London and Queenstown, told of a unique tragedy of the sea in which his ship, the American freighter Hatteras and radio played parts. The incident occurred during the trip across; the two ships never being closer together than 210 miles.

On December 29, the radio operator of the President Adams received the following message from the operator on the Hatteras, a vessel of the Baltimore Steamship Company, bound for Belfast, Dublin and Cardiff:

"Our Captain Matthews is dangerously ill. We have no doctor aboard. The surgeon of the Finland diagnosed his case by radio and believes that patient is suffering from pneumonia brought on by long watch on bridge during recent storms. Would like to have your surgeon advise immediately."

Dr. R.S. Fristell, of the President Adams ... prescribed whiskey for the sick captain. The radio operator of the Hatteras promptly replied that his ship was an American vessel and had no liquor aboard.

The ether was quiet until the next day. Then a message from the Hatteras informed the President Adams that Captain Matthews had just died. First Officer Pandel discovered that his ship had no Bible aboard. The burial could not be held until he could obtain the wording of the necessary ritual.

Purser W.E. Hughes of the President Adams came to the rescue. He went to the radio shack with his Bible and dictated the burial ritual to the operator, who relayed it to the Hatteras.

The Hatteras was quiet again for a while. Then it thanked the crew of the President Adams for their help.

Porthole Query. "Tea Table Gossip," Troy Times, January 18, 1923

Ship captains are asked a variety of questions by their passengers. Many of the questions are answerable, others but bring grey hairs to the heads of the ship commanders. Capt. Jonas Pendlebury, commanding the steamship President Adams of the United States Line, met with a stumper just before sailing from New York. He was halted on the deck by a woman passenger, who inquired: "Captain, how high from the water are the portholes to my stateroom?"

"About fifteen feet," politely replied Captain Pendlebury. "Thank you. Captain," retorted the inquiring female. "Now, will you kindly tell me the distance between my portholes and the water at high tide?"

"Well--er---well, you see--er--" began the badly dumfounded Captain, and then he fled to the safety of his bridge.

In 1939 the President Adams was renamed the President Grant and transferred to the Navy. When Japanese aircraft bombed Manila in 1941, the ship fled Darwin. Serving as a troop transport, the vessel grounded near Milne Bay, New Guinea in 1944 and was declared a total loss.

Tales from Another Two Captains

"Sea Serpent Just Grinned. Skipper Who Saw It Also Beheld a Floating Island with Pink Monkeys," New York Times, March 17, 1908

Strange things are to be seen these days along the southern steamship track, according to Capt. Mader of the fruit-carrying steamer Admiral Farragut, which got in yesterday from Port Antonio with a cargo of bananas.

Not only did the skipper sight a sea serpent which chased the ship for two days, but he saw a floating island populated by pink monkeys. To add to the interest of those on board, the crow laid eggs in the crow's nest and the ship received a decided list to starboard because part of her cargo, some 200 turtles, ran to the starboard rail to view New York as the vessel came up the bay.

"The Weather Vane," Buffalo Evening News, June 4, 1924, a sea-captain's tale of an enclave of Incan descendants on the Chilean island of "San Padre." When the islanders revolt against the mainland, they have but bows and arrows to defend themselves against rifles. All seems to be lost.

It was not until after the next morning that I awoke and came forth from my tent for my morning bath. Instinctively I looked toward where San Padre had been the night before. It was not there. There was no land in sight! The island was in the middle of a trackless ocean!

I ran in the tent of Sulklath Si and demanded an explanation. He smiled calmly. Then slowly he told me that then island had belonged to his fathers for countless centuries, and that to the firstborn son of every generation was told the secret of loosening it from its moorings and setting it adrift.

Chapter 50 -- Enjoy the Captain's Yarn

How we came safely to land at San Miguel weeks later is another story, but I beg you not to join in ridiculing this captain's story of floating islands.

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CHAPTER 51

CONSULT A VINTAGE TRAVEL GUIDE FOR THE BRITISH ISLES

The British have for centuries produced guidebooks to the natural wonders their islands. Below is an assortment of pages from a few of the publications.



Chapter 48 includes quotes from a number of such works regarding the periodic island of Derwentwater. We'll now peruse through the well-thumbed pages of vintage guidebooks, travel writings, early naturalist's records, and the like, in search of edification regarding other floating islands.

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Nibthwaite, Cumbria

It's no accident that Cumbria has come to be known as "The Lakes." Water -- in lake, tarn, beck, river, cascade, waterfall, bog, mist, rainbow, cloud, even in rain -- is a paramount element of the vistas.

And islands -- especially for an island race -- hold particular sway over the imagination. Islands were places of fantasy and myth: hermitages, strongholds, personal kingdoms.

Floating islands thus have long been central in the perception of Cumbrian landscape.

From The Old Man: or, Ravings and Ramblings Round Conistone (1864), by Alexander Gibson,

There was also a floating island about twenty yards square, finely covered with young birches of decent stature, which used to move about the lower end of the lake, but unfortunately it was stranded amongst the reeds near Nibthwaite by a strong north-east wind which prevailed for a day or two in October, 1846, when the lake was unusually swollen by heavy rains. I shall, perhaps, point it out to you by and bye.

And later,

I ought, in this tenth division of my discourse, to have remembered my promise relative to the floating island. I make the best reparation I can by telling you now, that the last time I saw the said island, it was stranded amongst the reeds between the Copper Quay at Nibthwaite and the outlet of the lake, and when I looked for it again, it had left that berth, and gone I knew not whither, but on enquiring after it at the Commodore of the Copper fleet, I was informed that the erratic object of my solicitude is now occupying a berth in juxtaposition to Mr. Harrison's quay, below Waterpark, where it may be inspected.

From John Knipe's lantern slide lecture, "Coniston Lake and its Associations" (1910), on the floating island at Nibthwaite.

Was about 20 yards long, and 18 across. At one time it used to move about the lower part of the lake, and on one occasion a man fastened it with a rope to a thorn tree at the south-west end of the lake. During a strong west wind in October, 1846, a boat-man, [William Wilson], cut the rope and the island was driven upon land where it remained for about 26 years, when it made another attempt to sail, but only to be driven more firmly upon the land, where it will probably remain. Had it preferred long voyages to short, it would have been an undeniable attraction to the Lake, and probably unique in this country. It is covered with birch trees of good height

Wybunbury Moss, Cheshire

Cheshire has numerous kettle-holes in which meres and mosses form the main concentration of schwingmoor in Great Britain.

Wybunbury Moss contains a raft of peat up to 4.5 meters deep, floating over 14 meters of water. The raft is dominated by *Sphagnum recurvum* with smaller amounts of *S. papillosum*, *S. rubellum* and other mosses. Vascular plants include *Vaccinium oxycoccus*, *Eriophorum angustifolium*, with small amounts of *Drosera rotundifolia*, *Andromeda polifolia* and *Calluna vulgaris*. *Pinus sylvestris* (Scots pine) are common but once they reach 2 meters, they begin to sink into the mat and drown.



The *Sphagnum* makes water acidic within the mat (mean pH 3.65) due to cation exchange by the dominant mosses. Free water below the mat is pH 6.55-7.20.

Macclesfield, Cheshire

An island which broke off after the water level was raised is cited by Symons (1888).

There is one good typical case at Capesthorne, about five miles west of Macclesfield. Of it the Rev. A.F. Claydon kindly gave me the following interesting account, Sept., 1887:

The island is nearly two acres in extent, and covered with silver beech trees and brushwood. The lake was raised about forty years ago two or three feet, which was the cause of the island floating away from the mainland to which it had been attached; the place is easily seen where it migrated from. It usually stood in the middle of the lake, but was frequently driven by the wind to the edge of the water, where it usually remained until a wind set in from some other quarter and carried it to the other side of the mere. About 1850 a S.W. wind drove it to the N.E. side where there is a small wood, and there it has remained ever since; being protected by the tall trees from easterly winds, there is not much chance of its ever going off again. The water is seventy feet deep on the S.W. and W. sides, but on the E. only about six feet; it is about fifteen or twenty feet from the mainland. I have rowed round it, and spent a long day on it fishing. A summer house has been built upon it, and there is also a platform to walk along as it is so boggy that one soon gets up to the knees in water if one tries to traverse it. It must be anchored to the bottom by roots extending at least three feet under the island, but this is perfectly possible.

Redesmere, Cheshire

In the late 18th century a string of three ornamental pools were excavated in the grounds of Capesthorne Hall. To keep the pools at constant level, a reservoir was needed, so the Fanshawe Brook was also dammed and an area of low-lying land to the south was flooded.

Summer Rambles in Cheshire, Derbyshire, Lancashire and Yorkshire (1866) by Leo Grindon,

Capesthorne. It is provided, moreover, with a floating island, one or two acres in extent, and covered with trees and brushwood, predominant among which is the fragrant shrub called sweet-gale. Ordinarily, the island remains moored near the center, but strong currents of wind move it away, and keep it so, until affected by powerful counter-currents.

To account for the origin of this floating island there is, of course, a legend, based, in the present instance, on the loves of the fair Isabel de Vere herself the daughter of a golden lineage and a certain Sir Reginald, (surname unrecorded,) who had achieved renown at Agincourt. The Lady Isabel lived in a cottage hard by, having been wronged of her possessions by one Sir Hugh de Moreton. This fact she confided to Sir Reginald, who attacked the despoiler, but unsuccessfully a stronger friend came, however, to the rescue, and the next

Christmas night Sir Hugh died suddenly. Then the lady resumed her rights and Sir Reginald, among others, thought she would make a pretty bride, more than a little jealous at the same time of the attentions paid by certain rivals, and vowing at last, that

"Until the island moved along
The bosom of the mere,
He would not look upon the face
Of Isabel de Vere"

By and by he fell sick. Isabel watched by his pillow and eventually love and faithfulness were rewarded by Heaven sending a hurricane that tore the island from its anchorage.

It's a touching story, but the island didn't appear until between about 1820 and 1840, floating in the sense of being buoyant, but still anchored to the lake bottom.



1842, the name "Floating Island".



1916



1957



1979, Island incorporated into encroaching shoreline

The 1842 label "Floating Island" may have more than passing significance. Surveying instruments by then had an accuracy close to that of today; the work just took longer. Unlike travel writers prone to pass along unconfirmed tales, cartographers tended to be tiresomely factual, and as such, would not have affixed a label based on pure hearsay. An island, after all, would have been in clear view of well-traveled shore. Perhaps what's most significant is the fact that of all the reputed "floating islands" noted in this chapter, this is the only one that appears to have passed the muster of British mapmaking.

Journal of the Architectural, Archaeological and Historic Society of Chester 2, 1862,

We have in one of our Meres -- Redesmere -- a floating island. It is a mass of peat moss, about two statute acres in extent; its outer edge carries a belt of alder and birch trees (some twenty yards wide), some of the trees being twenty feet high and a foot in diameter. The interior is formed of a mass of long grass, cranberry, bog myrtle, and heather, all matted together. It requires a flood and wind from a particular point to move it from its usual position; but occasionally, when retained in deep water till the flood subsides, a very slight wind is sufficient to make it shift its position, and it has done so, the Rev. R. Heptinstall informs me, three times in one day. It has now been stationary about two years, and it requires some depth of water in the Mere to allow it to move say a distance of one-third by a quarter of a mile.

John Murray's comments, from Handbook for Shropshire and Cheshire (1879),

*The well-timbered grounds, through which the road from Stockport to Congleton runs, are ornamented with a fine sheet of water called Redesmere, forming a floating island about 1½ acres in size, which in strong winds is blown about here and there. *Aspidium Thelypteris* is found on Redesmere. A country legend accounts for the floating island by a story, that a certain knight was jealous of his lady-love, and vowed not to look upon her face until the island moved on the face of the mere. But he fell sick and was nigh to death, when he was nursed back to health by the lady, to reward whose constancy a tremendous hurricane tore the island up by the roots.*

We're a mere four miles away from the floating island, which does exist. It so offended the bureaucrats that they chained it to the shore. It is now tethered. Originally some peat bed must have come adrift and acquired seeds and enough firm land for trees to grow on it. The trees act as a sail to the wind, and so it tends to drift about the lake.

The lady of the local landowner fell in love with a knight at the time of the Crusades. As I recall, when he went away to the Crusades, he said that he would be faithful to her, even against all the odds. She didn't believe him, but he said that even though the island floats upon the mere, that is not more strange than my being faithful to you. The island did float whenever she experienced moments of doubt, and so her faith was restored.

A.F. Claydon gave Symons (1888) the following account from September of 1887:

The island is nearly two acres in extent, and covered with silver beech trees and brushwood. The lake was raised about forty years ago two or three feet, which was the cause of the island floating away from the mainland to which it had been attached; the place is easily seen where it migrated from. It usually stood in the middle of the lake, but was frequently driven by the wind to the edge of the water, where it usually remained until a wind set in from some other quarter and carried it to the other side of the mere. About 1850, a S.W. wind drove it to the N.E. side where there is a small wood, and there it has remained ever since; being protected by the tall trees from easterly winds, there is not much chance of its ever going off again. The water is seventy feet deep on the S.W. and W. sides, but on the E. only about six feet; it is about fifteen or twenty feet from the mainland.

From Alfred Coward's Cheshire Traditions and History (1932),

From time to time, when the water is low, there appears on the surface a mass of peat and aquatic vegetation known as the "floating island". Similar masses, dislodged from the banks, and stranded in shallow water, occur on other meres, and some of them certainly float, forming islands on which the ducks rest in the same way they do on "hovers" on the Broads. This imagined island gave origin to a local tradition, which without apparently any historical foundation has been converted into a ballad.

The Commodore of Redesmere Sailing Club states that an island of peat and vegetation with trees growing upon it was blown around the lake until the 1970s, at which time it grounded itself on the east bank where it remains to this day.

Local resident Raymond Rush adds that chains to stabilize the island have since rusted away.



Bagmere, Cheshire

Daniel King, The Vale-Royall of England, or, The County Palatine of Chester (1656), on the floating island,

We pass along by that famous mere called the Bagmere, being very large and deep, and from it runs a water called Croco, which quickly hastens to increase the Dane. If here I should either pass in silence, or call in question that common report of the Trees in the Pool, which are said to lift up themselves into sight above the water, before such time as any heir of the house of the Breretons the owner thereof dieth, I would be thought too nice and strict, in giving way to the Current of all Writers, and too injurious to the Wonder-tellers of all Ages. But I profess a love to truth and by such enquiry as I have made, I could never learn that the worthy knights and owners themselves of that great seat, have much regarded that observation, but rather thought (as for my own part I do) that the rising sometime of those trees, is for the time merely accidental, and for the signification nothing at all, but even as other the like bulks and bodies of wood or earth or other substance that lie floating in deep waters, which by winds, or other natural motions do stir, are diversely raised or depressed. So these, at some time, are so carried by some natural cause not so fully appearing to men's understanding.

Chartley Moss, Staffordshire

Created by the dissolution of underlying saliferous deposits, at 106 hectares, Chartley Moss is the largest mire in England. The pond covers around 25 hectares and supports a 3-meter thick raft floating over 9 meters of water. The open swingmoor is dominated by *Sphagnum recurvum* with associated species much the same as at Wybunbury.

Trees growing in the raft eventually sink through the surface under their own weight and drown. Dead trunks protrude out of half out of the moss.



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Robert Plot's The Natural History of Staffordshire (1686),

Of such kind of springy bituminous earths (roots and oily substances being very buoyant) the floating islands so much talked of, and admired in many parts of the word are most certainly constituted, whereof there are two about 20 foot broad, but about 30 or perhaps 40 foot long, in Kinson Pool belonging to the courteous and most obliging Gent. Walter Fowler of St. Thomas Esq. which An: 1680 began in March to move from under the hill on the N.W. side of the pool and came together like the Symplegades, first to the S. W. corner, where after they had continued about 3 weeks, they began to move again, and were come in May (when I was there) to the S.E. corner, lying just in the passage of the water out of the pool toward the mill : I was told also of such in Aqualat Meer, which 'tis like at first might be nothing but a kind of Scum upon the water mixt with a few weeds, covered over above in part with dust brought by the winds, and supplied at the same time underneath, with other viscous terrestrieties, elevated by the vapors from the bottoms of the pools ;and such process of time becoming a fungous sort of earth, bearing weeds, dwarf willows, and such kind of trash, and floating above water.

Southampton Water, Hampshire

In "A Floating Island," Hampshire Notes and Queries 1 (1883), Jay Tee reports a floating island which ceased to float around 1870.

The floating island which "W.H." asks about existed less than fifteen years ago, and indeed exists still, but its distinctive features have gone. It consisted of two and a-half to three acres of land in an inlet from Southampton Water, close by Fawley, and at times, when the tide was high, floated up and down the stream. There were then trees as high as thirty feet growing on it. Since that time the marshy bed above which the island moved has been drained, and the roots of the trees upon the island have penetrated it, thus casting a kind of natural anchor, and mooring the straying little vessel to the shore. It is, in consequence, now quite motionless.

Priest Pot, Lancashire

Priest Pot, near Esthwaite Lake, once served to supply fish to the monks of Furness Abbey at their Grange at Hawkshead Hall, and once may have had a floating island.

According to Topographical Descriptions of Cumberland, Westmorland and Lancashire (1800), by John Housman, the island broke loose about 1796, but after being blown about for some four years it was blown ashore again.

The island may thus have been short-lived, but the same can't be said regarding its inclusion in another century's worth of guidebooks.



Jonathan Otley, Guidebook, Concise Description of the English Lakes (1823,

On a pond called Priest Pot, near the head of this lake [Esthwaite Water], there is a Floating Island 24 yards in length, and 5 or 6 in breadth; supporting several alder and willow trees of considerable size. Differing from one in Derwent lake, which rises occasionally from the bottom, this remains always upon the surface, generally resting against the shore; but when the water is high, it is frequently moved from side to side by a change of wind; and has undoubtedly been thus torn from the bank at some remote period.

Edward Baines, A Companion to the Lakes of Cumberland, Westmoreland, and Lancashire: In a Descriptive Account of a Family Tour, and Excursions on Horseback and on Foot (1834),

The lake is about two miles long, and beyond the head of it is a pool which contains a floating island, bearing several considerable trees and shrubs. I was assured by "mine host" of the Red Lion, Hawkshead, that he had seen this island several times floating from one side of the pool to the other, as the wind changed. When I was there, it was close to the eastern shore.

William Wordsworth, Guide through the District of the Lakes (1835),

On one of the pools near Esthwaite may sometimes be seen a mossy islet with trees upon it, shifting about before the wind, a lusus naturae frequent on the great rivers of America, and not unknown in other parts of the world.

William Ford, Description of Scenery in the Lake District (1839),

Esthwaitewater is about two miles in length, and half a mile across. It is encompassed by an excellent carriage road, and from its unequal figure and enclosures - its two peninsulas fringed with trees, shooting into the lake, form exceeding good scenery. Perch, pike, eels and trout are the fish taken in this water. A small floating island also occasionally appears to astonish the beholder.

Henry Ince and Robert Mudie, Eds., The Wonders of the World, in Nature, Art & Mind (1850),

At the head of Esthwaite Lake, Hawkeshead, there is a smaller sheet of water, known by the name of the Priestpot, but connected with the other lake by a small outlet. Upon this there has been for many years a floating island, little noticed by tourists, and erroneously stated by some writers of "Guides to the Lakes" not to move or sail with the wind. In contradiction to this, it was never known since first it became a floating island to have remained stationary, or to be fixed for any length of time, till a few years back, when the heavy floods lifted one half of it upon land. It was re-launched by some young men who took advantage of the flood at that time to affect their purpose, and had the pleasure of sailing across the lake upon it. It was afterwards moved from one lake to the other four different times on one of its trips, no fewer than fifteen persons were upon it. It is thirty yards long by five broad, and covered with wood of various sorts, which supplies the place of sails. This curiosity has not probably its equal in the United Kingdom.

Adam and Charles Black, Black's Guide to the English Lakes (1856),

In a pond near the head is a diminutive floating island, having upon it several small trees.

Henry Jenkinson, Practical Guide to the English Lakes (1872),

A pool at the N. end of the lake is said to have contained a floating islet, upon which grew a few trees. The islet, which only moved about before a strong breeze, has of late become attached to the shore. An old inhabitant informed the writer that he remembers it getting fixed to the side many years ago, and how he assisted setting it afloat by tying ropes to the trees and pulling it from the shore.

Transactions of the Cumberland and Westmoreland Antiquarian & Archeological Society (1880),

Adjoining Esthwaite Water... there is a lake or small tarn called Priestpot, upon which there is an island containing about a rood of land, and mostly covered by willows, some of them eighteen or twenty feet high, known by the name of the "car." At the breaking up of the severe frost of 1795, a boy ran into the house of the proprietor of the island and told him, "that his car was coming up the tarn."

The owner and his family looked, and beheld with astonishment, "not Birnam Wood coming to Dunsinane," but the woody island approaching them with slow and majestic motion. It retreated, however, before it reached the edge of the tarn, and afterward frequently changed its place as the wind shifted, being sometimes at one side, sometimes at the center. It is conjectured to have been long separated from the bed of the lake, and only fastened by the

roots of some of the trees, which were probably broken up by the rise of the waters on the breaking of the ice.

Harriet Martineau, Guide Book, A Complete Guide to the English Lakes (1895),

A round pond at the northern end of the lake [Esthwaite Water], connected with it by a narrow creek, exhibits a strange phenomenon. It has a floating island -- not like that of Derwentwater, which is a mass of mud and vegetable tangle, - but actually bearing trees: and this island is carried by strong winds from the one side to the other. The name of the pond is Priest's Pot

Henry Cowper, Hawkshead (1899), notes that the older guide-books report

A floating island, a phenomenon which the writers of the early half of the century describe with great care as a prodigious marvel. It seems, however, to have been but a poor affair, a bit of peaty earth, 24 yards by 5 or 6 yards, with a tree or two upon it, which had got loose from the side. Floating islands were a special craze, somehow, of those talented folks who discovered the lake district, but they seem now to have got neglected, and taking umbrage at their treatment have either formed a new and permanent attachment, or else have precipitated themselves despairingly to the bottom of the lake.

A footnote:

The island is now grown to the south-east margin of the tarn. It probably owed its origin to the leverage of wind against trees which had grown on it, the pressure thus detaching a portion of the peaty margin.

"Phenomenal Islands that Play Hide and Seek," San Francisco Call, April 28, 1901

In Esthwaite Lake, a natural floating island has been used as a ferry capable of holding fifteen persons.

"Hawkshead" (1911) by Arthur Tucker.
Priest's Pot in foreground



The burgeoning tourist trade called for annotated maps. Esthwaite Lake is always shown, and in the more-detailed renditions, even a nearby pond that seems to fit the description of Priest's Pot. No map, however, designates an island to be "floating."

Llyn y Dywarchen, Wales

Llyn y Dywarchen (Lake of the Sod) has a small island in the center, not uncommon in highly glaciated areas.

Legend tells of a shepherd who marries a beautiful water-nymph from Llyn y Dywarchen, but breaks three taboos which result in her being forced to return to her lake, never to set foot on shore again. The forlorn creature creates a floating island of peat, and, by standing on it while her husband and children stand on the shore, is able to satisfy the terms of her banishment yet still speak to her loved ones.

In Itinerary of Archbishop Baldwin through Wales:(1188), Giraldus Cambrensis notes the Mountains of Eryri (Snowdonia in English).

On the highest parts of these mountains are two lakes worthy of admiration. The one has a floating island in it, which is often driven from one side to the other by the force of the winds;

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and the shepherds behold with astonishment their cattle, whilst feeding, carried to the distant parts of the lake.

A part of the bank naturally bound together by the roots of willows and other shrubs may have been broken off, and increased by the alluvion of the earth from the shore; and being continually agitated by the winds, which in so elevated a situation blow with great violence, it cannot reunite itself firmly with the banks.

Cambrensis' Topographia Hibernica (1188), as well, mentions the island, reporting (if perhaps not believing) that young man shot a red-hot arrow into the island and this magically fixed it in place, recalling the fixing in place of the isle of Delos (Chapter 1).

A small pond, called Llyn y Dywarchen (i.e. Lacus Cespitis), from a little green moveable patch, which ii all occasion of the fable of the wandering island

Of an island which at first floated and afterwards was firmly fixed by means of fire.

Among the other islands is one newly formed, which they call the phantom isle which had its origin in this manner. One calm day, a large mass of earth rose to the surface of the sea, where no land had ever been seen before, to the great amazement of the islanders who observed it. Some of them said that it was whale, or other immense sea monster; others, remarking that it continued motionless, said, "No; it is land."

In order, therefore, to reduce their doubts to certainty, some picked young men of the island determined to approach nearer the spot in a boat. When, however, they came so near to it that they thought they should go on shore, the island sank in the water and entirely vanished from sight. The next day it re-appeared and again mocked the some youths with the like delusion. At length, upon their rowing towards it on the third day, they followed the advice of an older man and let fly an arrow barbed with red-hot steel against island; and after landing, found it stationary and habitable.

William Camden, in Britannia (1577), passes the story forward -- albeit with a lack of surety -- that the island may still be recognized in Llyn y Dywarchen as a small green moveable patch of earth which floats upon its bosom,

I shall say nothing of the two lakes on the tops of these Mountains (in one of which there floats a wandering Island, and the other affords plenty of fish, each whereof has but one eye;) lest I might seem to countenance fables; though some, relying on Giraldus's authority, have believ'd both. However, that there are lakes and standing waters on the tops of these mountains, is certain: whence Gervase of Tilbury, in his book entitl'd Otia Imperialia, writes thus:

In the land of Wales within the bounds of Great Britain, are high mountains, which have laid their foundations on exceeding hard rocks; on the tops whereof the ground is so boggy, that where you do but just place your foot, you'll perceive it to move a stone's cast off. Wherefore upon any surprise of an enemy, the Welsh by their agility skipping over that boggy ground, do either escape their assaults, or resolutely expect them, while they advance forward to their own ruin.

John Speed, in Theatre of the Empire of Great Britain (1602), likewise withholds full endorsement of the report.

Touching these two miracles famed by Giruldus and Gervasius that on those his high hills there are two pools called the Mears, the one of which produceth great store of fish, but all having only one eye, and in the other there is a movable island, which as soon as a man treadeth on, it forthwith floateth a great way off, whereby the Welsh are said to have often escaped and deluded their enemies assailing them ; these matters are out of my creed, and yet I think the reader had rather believe them, then to go and see whether it be so or no.

Edmund Halley, in "Concerning the Torricellian Experiment tried on the Top of Snowdon Hill," Philosophical Transactions (1698), describes his swim to the island in 1698 to verify that it did indeed float.

I was on board a floating island, as it may be called; the lake is scarce half a mile about, environed with a boggy, turfy soil, a piece of which, about six yards long and four broad, floats on the water, having broad-spreading fungous roots on its sides, the light ness of which buoys it up. It was driven on the lee shore, but I launched it off and swam it to be satisfied it floated. This I take the more notice of, because it is denied to be true by the author of the additions to Camden, lately published; but I myself saw it as described, and was told it had formerly been bigger there being a lesser spot that they told us had been heretofore a part thereof, which floated likewise.

From Literary and Miscellaneous Memoirs (1770) by Joseph Cradock,

The lake, as they called it, was somewhat bigger than a duck-pond, and the island was a knotty piece bog which, after very heavy rains, might very possibly float in it.

Thomas Pennant, in Tours in Wales (1784) claims to have seen the island and confirms that cattle which stray upon it when it is near the shore are occasionally marooned when it moves,

I turned to the right, to visit Llyn y Dywarchen, or the Lake of the Sod, long since celebrated by the hyperbolic pen of Giraldus for its insula erratica, its wandering island, as he calls it. That little lake is seated in the middle of a turbery; and at this time actually exhibited the phenomenon recorded by our romantic historian. It had on it a floating island, of an irregular shape, and about nine yards long. It appeared to be only a piece of the turbery, undermined by the water, torn off, and kept together by the close entangling of the roots, which form that species of ground. It frequently is set in motion by the wind; often joins its native banks; and, as Giraldus says, cattle are frequently surprised on it, and by another gale carried a short voyage from the shore.

William Bingley's North Wales: Delineated from Two Excursions Through all the Interesting Parts (1814) refers to a 1798 sighting.

Llyn y Dywarchen, the Pool of the Sod, first celebrated by Giraldus Cambrensis in the account of his journey through Wales, in the twelfth century, as containing a floating island. This is yet in existence, but is not more than eight or nine yards in length, and evidently appears to have been a detached piece of the peat of which the bank is composed. There is a small willow tree growing upon it and it is carried to and fro by the action of the wind and water. Sometimes it remains near the side of the pool for a considerable while, and it is so large and firm as to bear cattle upon it. When it has been dislodged by the wind, a sheep or two have often been borne by it to the other parts of the bank.

According to "Floating Islands." Chambers's Journal, April 13 1850,

*This isle is 51 feet long by 29 broad, and is said to be about 25 inches in thickness, though the last measurement is in all probability annually increased by the deposition and decay of vegetable matter. These islands are attributed by Mr. Gahn to the twisted roots of the ropy bog-rush (*Scizanus mariscus*), the scalystalked spike-rush (*Scirpus cespitosus*), or "deer's hair," of the Highlanders; and the rigid carex (*Carers cespitosa*), gradually overlaid by a vegetable mould, and fitted for the growth of other plants.*

From John Rhys' Celtic Folklore, Welsh and Manx (1901),

For one of the two lakes holds a wandering island, which strays mostly with the force of the winds impelling it to the opposite parts of the lake. Sometimes cattle grazing on it are, to the surprise of the shepherds, suddenly carried across to the more distant parts. Sheep are known to get on the floating islet, and it is still believed to float them away from the shore.

Rhys also mentions an intermittent floating island in the sea near Grassholme, Pembrokeshire,

I have heard old people say there is a floating island off there, that some- times rises to the surface, or nearly, and then sinks down again fathoms deep, so that no one sees it for years, and how it may be, I do not know, but that is what they say.'

"The Fairies' Revenge" in the same volume recounts a Llyn y Dywarchenian legend in which a loving wife is forbidden by her father to ever again see her husband and children.

Some say, however, that she sometimes contrived to see her beloved one in the following manner. As the law of her country did not permit her to frequent the earth with an earthly being, she and her mother invented a way of avoiding the one thing and of securing the other. A great piece of sod was set to float on the surface of the lake, and on that she used to be for long hours, freely conversing in tenderness with her consort on shore; by means of that plan they managed to live together until he breathed his last. '

Thomas Llewelyn, in The Short and Easy Route to Snowdon via the North Wales Narrow-Guage Railway; The Floating Island of Snowdonia, &c. (1885), reports that the island of Llyn-y-Dywarchen, though diminished in size, still exists.

Immediately behind a bank, at the back of the cottage, is a mountain tarn, lying in a hollow of Mynydd Mawr, and in this lake is one of the wonders of Wales -- a floating island. The name of the lake -- which Bingley says is "about the size of a good horse pond," but actually covers over sixty acres -- is Llyn-y-Dywarchen, or the pool of the floating turf.

On my first visit to the lake, although I was not aware that it contained the far-famed shifting island, the scenery so interested me that I took notes of the place and in writing of my ramble, I made use of the following words:

Unfortunately, although we visited this lake, we were then ignorant of the fact that it was the tarn credited with the floating marvel, and possibly we saw the island without being aware of its shifting propensities.

My first informant told me that the island used to float from one side of the lake to the other, but that some years ago, a great drought came and the rootlets on the island grew to the main shore, since which time -- as far as he knew -- it had not moved. On a later occasion, while journeying up Snowdon, my guide informed me that the island had, to his knowledge, moved from one end of the lake to the other, within the last few years, and afterwards that statement received corroboration from others. Having an opportunity a few weeks ago of seeing for myself, I paid a hurried visit to the lake and was rewarded by being shown the wonderful islet, which was then a few yards from the shore, at the south-eastern corner of the lake. It has lost its tree and some of its bulk -- perhaps the tree had become top-heavy and carried away a portion of the islet with it -- and appeared like a floating grassy platform, large enough to erect a cottage upon. The people in the neighborhood do not look upon the phenomenon in the light of a marvel, probably thinking such things common in nature.

On Alpine Heights and British Crags (1916) by George Abraham,

The curious Dwarchen Lake, which washes the clean-cut crags of the Clogwyn on one side, is famous for its floating island. "The wandering isle" of Camden's time consisted of a large mass of turf with broad, spreading, fungous roots, evidently a part of the surrounding peaty shore-line which had become detached. The artificial raising of the lake has robbed it of its romance, but a certain water enthusiast recently improvised a floating island in order to gain a special "nose" on the Clogwyn which overhangs deep water.

As with many floating islands of yore, history has been unkind. The lake's natural northerly outlet was dammed in the late 1800s and drainage is now to the south. Any floating feature that once intrigued visitors was a casualty. The island of today is very much affixed to the bed.



Llyn Mynyllod, Wales

Edward Lhuyd, Parochialia: Being a Summary of Answers to Parochial Queries in Order to a Geographical Dictionary, etc., of Wales (1699) mentions three floating islands,

Tourists' Guide to North Wales (1887), by Abel Heywood, brings the count down to one.

The chief peculiarity of this lake is its floating island -- the various positions of which some persons believe prognosticate the state of the market.

John Sampson, "Welsh Gypsy Folk Tales, Journal of the Gypsy Lore Society, 1909, makes it zero.

Returning from Llyn Mynyllod, the mountain tarn with the floating island, a little wasted away.



Loycha, Ireland

In the Republic of Ireland, wetlands classified as "transition mire and quaking bog" (an EU Habitats Directive category) are estimated to cover 1,955 hectares, but as this includes scraw communities of wet hollows, terrestrialized basins and open water transitions, the figure for floating formations is much less. "Scraw" refers to quaking mats of peat vegetation; encompassing schwingmoor and a range of terrestrial mires.

The King's Mirror, Latin: Speculum Regale (c. 1250) speaks of Loycha, an island floating on an Irish lake on which grow herbs that can cure all ills, but no more than one person can land on it at a time.

There is also a lake in that country which the natives call Loycha. In that lake there is what appears to be a little floating island; for it floats about in the lake, here and there approaching

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the shore sometimes so near that one may step out upon it; and this occurs most frequently on Sundays. And such is the property of this islet that if one who is ill steps out upon it and partakes of the herbs that grow there, he is healed at once, no matter what his ailment may be. Another singular fact is this, that never more than one can come upon it at one time, though many may wish to do so; for as soon as one has landed, the island immediately floats away. It also has this peculiarity that it floats constantly about in the lake for seven winters; but as soon as the seventh winter is past, it floats to the shore somewhere and unites with the other land, as if it had always been joined to it. But when that moment has come, a crash like a peal of thunder is heard, and, when the din is past, another island can be seen in the lake of the same size and character as the earlier one. Thus it happens regularly every seventh year that, as soon as the one island has joined the mainland, another appears, though no one knows whence it comes.

The location Loycha is uncertain, but if name has stuck with the place -- not always a good bet -- it may be today's Lough Key, with its 13 islets, none of which floats.



Lough Quinlan, Ireland

The Ancient and Present State of the County of Kerry: Being a Natural, Civil, Ecclesiastical, Historical, and Topographical Description Thereof (1756) by Charles Smith,

Near this place is a considerable fresh water lake called Lough Quinlan, in which are some small floating islands much admired by the country people... I have also met with the same kind in the barony of Carbery in the county of Cork.

Long kinds of grass, which being blown off the adjacent grounds about the month of September, and floating about, collect slime and other stuff and so yearly increase till they come to have grass, and other vegetables grow upon them. This lake is the head of one of the above mentioned rivulets, which afford fine trout, and salmon of a most excellent flavor.

Francis Bigger's "The Lake and Church of Kilmakilloge," Journal of the Royal Society of Antiquaries of Ireland 28 (1898) speaks of the island as holy.

We spent some hours examining the lake and its surroundings, especially those singular clumps or masses of luxuriant reedy growth on its banks, known as the tussachs. On the day of my visit I counted five of those on the Bide of the lake adjoining the ancient hermitage, the ruins of which remain on a rising ground beside the lake. Those tussachs I saw were of various sizes, and apparently of various ages and stages of growth, some clinging closely to the border of the water, some partly afloat and detached, but one, the largest of them, about 4 feet long and 3 feet wide, was quite detached from the bank and afloat on the water. While I was looking on, a young lad from the locality came up, having in his hand a long pole, which he brought from a boat on the neighboring seashore, and he volunteered to board this large tussach and push out with his pole, into the deep. He floated pleasantly for a while, but he had pushed too far, beyond the reach of the pole, and soon found himself near the center of the deep pool,

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becalmed and motionless, without any means of working back the tussach to the bank. Here he had to remain for some time longer than he bargained for, and though he was full of courage he was plainly uneasy and at his wits' end for a way to get back. I told him to work his pole as a paddle towards the bank, and by doing so he gradually moved his singular float to its former place, to which it seemed to be anchored by long fibrous roots passing into the depths of the lake. He did not venture to get afloat again, and we had no further motion of any of the other tussachs. The growth and formation of these is very strange and curious. They spring from the bank of the lake, which is a mass- of reeds, sedges, and peat, overhanging the water, and from which many fibrous knarled roots strike into the mud below. From the edges of this bank the tussachs have their birth. They gradually increase in size, until they, by their weight and the action of the winds on the reeds growing upon them, are detached from the bank and get afloat on the lake, where they float for years, moving about occasionally, until in the course of gradual decay, they lose their buoyancy and sink to the bottom, which they are, no doubt, slowly but surely silting up. The depth of the lake has not, as far as I know, been properly fathomed, or sounded at any time, but it is remarkably deep for a lake of its dimensions.

Loch Macinlane, Ireland

From History of Kerry (1754) by an anonymous cleric,

Loch Macinlane, i.e., the lake of St. Matalongus, in that part of Glanaroch, called Tuosist, is very remarkable for pilgrimaging and devotion, especially on the Patron days, in the parish of said Tuosist, and several pieces or parcels of the banks of said loch, to the size of a large sheaf of wheat, and some larger, separate themselves from said banks, generally to the number of six, seven, or nine, which, without either storm, flood, or wind, go in motion, sailing from one side to the other, where they close into the bank in such a manner as that no distinction can be made. They are called by the inhabitants of said place Tussock.

I have seen of them but three in such motion as aforesaid, and on such a still and calm day that I could not imagine a breeze of wind strong enough to blow a feather from one side of the loch to the other.

One of the said Tussocks goes seemingly lame or limping, which is called the Lame Tussock,' occasioned, as is generally reported, by a soldier going by the loch, who threw his pike or spear thereat, and thus caused that limping. 'Tis further reported still in the neighborhood that said soldier was drowned soon after in the rivulet flowing from the lake.

Other Floating Islands of Ireland

Charles Smith's The Ancient and Present State of the County and City of Cork (1750) mentions floating islands between Leap and Skibbereen.

Between the Leap and Skibbereen, are many loughs, stored with trout and eels, which the Irish call aghills; and some have small floating islands, which swim from one side to the other ; I have seen some of them above ten yards broad ; they are usually composed, at first, of the above-mentioned long grass, which gathering together by degrees, being blown off the adjacent grounds in September, form a kind of a tussock, and increase every year, by the addition of slime and other matter, that they collect in floating about the sides and edges of the lakes.

In the parish of Kilmaceba, is a lake, called Loughdrine, which the country people hold to be miraculous; and say, that on a certain day of the year, all the islands in it change places, and shift from one side to the other, at which time, vast numbers of these ignorant people assemble at this lough, where they erect booths, and feast, every one bringing bits of bread, meal, &c. to feed the fish in the lake.

A Statistical Survey of the County of Kildare (1807), by Thomas Rawson, passes on a tale from Tipperary.

In almost all the bogs of any considerable depth, it is found that a quantity of water lies in a body between the turbarry and the gravel, which keeps the turbarry in a buoyant state, and contributes to the growth of the fungus substance; a turf cutter well knows it, and with fear and caution approaches the bottom of the turf hole, from which the water frequently bursts up through a close covering of two or three feet, and would overwhelm him in a moment, did he not leave benches uncut to secure his retreat.

In the county of Tipperary, within a few years, a bog was so overcharged with under-water, that it broke from its ancient situation, and travelled in a compact body over several miles of country, bearing down houses, trees, and everything that opposed its progress, until it reached the river Suir, twenty miles from its original situation.

An Account of Ireland, Statistical and Political (1812), by Edward Wakefield, mentions a 1745 incident at the bog of Addergoole, near Dunmore.

After a most violent and surprising fall of rain, accompanied with a dreadful, though unknown noise, a turbarry, containing ten acres, in which some people had been at work, and which they had quitted to seek shelter from the storm, was seen floating after them, till it subsided at last upon a low piece of pasture of nearly thirty acres, close to the river's side, called Higgins's Park, where it spread and settled, covering the whole of it, to the great astonishment of all those who beheld it.

Loch Lomond, Scotland

The "floating island" of Loch Lomond is the loch's very-fixed Inchconnachan Island, shown as the red dot to the right. Folklore holds that the island was originally a "crannog," artificial constructed of square oak beams mortised together by Keith Macindoil, who is said to have died in the 5th century.

As to the floating aspect, perhaps we can read between the lines from Letters and Papers, Foreign and Domestic, of the Reign of Henry VIII (1509-1547), in which the Danish ambassador,

Asked if there were in Scotland trees on which birds grew and was given an account of them. There is a floating island, which goes from shore to shore with the tide.



In Cosmographia Universalis (1552), Sebastian Münster writes that the floating island has excellent grazing and is well stocked.

The History of the Scots from Their First Origin Together with an Account of Other Matters of Uncommon Distinction (1575) by Hector Boece (Boethius) notes three "memorable things" regarding Loch Lomond.

It possesses tasty fish that lack scales.

Sometimes, although no wind is blowing, its waters becomes so roiled that they would deter even the boldest sailors. Hence, even when the wind is falling, ships caught in mid-course are tossed about to their great peril, and, unless some harbor happens to be at hand, they are often capsized.

There is a certain island rich in pasturage for sheep and cattle, but it floats and is driven hither and thither by tides and winds.

According to William Camden's Britannia (1577),

As for the floating island, I shall not in truth call it in question; for what could hinder a body from swimming that is dry and hollow like a pinnace [a small vessel used as a tender], and very light?

De Rerum Varietate (1557) by Girolamo Cardano, Introductio in Universam Geographiam (1667) by Philipp Cluver and Geographia Generalis (1650) by Bernhardus Varenius each mention that upon Loch Lomond floats an island carried about by the wind, and sufficient to graze sheep.

The Abridgement or Summarie of the Scots Chronicles (1612) by John Monipennie describes the island as,

Not corroborate, nor united to the ground, but hath been perpetually loose; and although it be fertile of good grass, and replenished with nolte, yet it moves by the waves of the water, and is transported sometimes towards one point, and other whiles towards another.

Richard Franck's Northern Memoirs (1658), however, dismisses the idea.

The large and spacious Loemon, so generally discours'd for the floating island; but it floats not here in these solitary Western Fields, as fictitiously supposed by the ignorant reporters.

The Lives and Characters of the Most Eminent Writers of the Scots Nation: 2 (1711), by George Mackenzie,

The Inhabitants of old used to fasten great Beams or Trees together, which they covered with Turf; and in time of War, or on other Occasions, they went upon this Float from one Island to another, which did give the Occasion to the Fabulous Story of & Floating Island in this Loch.

Curieuse Reisen (1669-98), Jordan de Colombier, writes that the most important islands all float on the loch.

To the right, a map from 1712. In the box,

Loch Lomond famous for its floating island, its fish without fins, and being frequently tempestuous in a calm.

According to The History of the Kings of Scotland (1722), by Matthew Duncan,

Lake Lowmond, in which are fish without fins, very pleasant to eat. The water of this lake turns timber into stone. It is also remarkable for 24 islands, one of them according to some, being a floating island; and that which is strange, it is observed that the waves are continually raging in this lake, though the air be calm.



History of Stirlingshire. Corrected and Brought Down to the Present Time (1817) by W.M. Stirling, manuscript of about 1725 by the historian of Buchanans,

There is a story of a floating island to be in Loch Lomond and is said to be a small island near the south shore, upon which grows some bushes and willow and other timber, but that which in greatest probability may be judged the floating isle is a small isle lying at a little distance from the north shore of that loch near a point of land called Row of Cashill, this land being kown to be founded upon a float of timber which in the summer of 1715 was clearly discovered by one Walker who with his boat passing the isle observed one end of a large square oak just below the island, which with another of the same sort he found means to get up, both being of a prodigious bigness; the manner of joining that large float being this, there were in the one joist three or four large square mortices, and in the other one, equal number of planks proportional to the mortices, and joined so firmly together as if all were one solid piece, upon which this isle was built, and did probably for some time float upon the surace of the water, while in process of time it settled upon the channel.

A Journey to the Highlands of Scotland (1777), by Mary Hanway, provides a first-hand substantiation.

I saw the floating island mentioned by [Tobias] Smollet; it is evidently a part of the bank which the rapidity of the torrent has forced off and carried with it into the lake; it is not large, and often undulates from one side to the other. Sir James [Colquhoun] planted some little trees on it, but they do not thrive, though the sod has a beautiful verdure.

John Wilkes' Encyclopaedia Londinensis, or, Universal Dictionary of Arts, Sciences, and Literature (1814) proves to be somewhat ahead of its competition, updating Boece's three "memorable things" with observant hypotheses.

Loch Lomond has long been celebrated for three wonders; "fish without fins, waves without wind, and a floating island." The fish without fins are manifestly vipers, which abound here in great plenty, and sometimes swim from one island to another. Waves without wind are common to this lake, with all extensive deep waters, when a calm immediately succeeds a storm. The floating island is now fixed near the west shore of the Isle of Inchconagan; and, if it ever did float, must be considered as a mossy fragment bound together by the matted roots of coarse grasses, willows, Dutch myrtles, etc..

Conrad Malte-Brun's Universal Geography (1827), on the other hand, is content with vagueness.

The delightful Loch Lomond, in Scotland, contains some of these floating islands, which are not very uncommon in Scotland or Ireland.

Early in the 19th century, the floating island was said to have become attached to the west side of Inchconnachan.

From The Chiefs of Colquhoun and Their Country (1869) by William Fraser,

The marvel of the floating island on the lake, although no one has ever pretended to have seen it, with its flocks and shepherds, has been resolved into a floating mass of entangled roots, branches, and earth, bearing the marks of vegetation; and we can easily conceive that masses of this description, of enormous bulk, might be washed into Loch Lomond from the lofty mountains by which it is surrounded, or might collect and float in its waters.

The photograph "Floating Island, Loch Lomond" (1881) appears to show what might be a floating island, but as the photograph was an artistic work, contains no additional information about its subject.



Symons (1888) reports on the island.

Early in this century it was reported as being attached to the west side of the Island of Inch Conachan, or Colquhoun's Island, near Luss; and Dr. Mill tells me that a small islet about twelve feet in diameter and one foot above the water, close to Inch Conachan, is still reputed to have been the floating island, and is so marked on some maps.

The Spell of Scotland (1916) by Keith Clark,

There are twenty-four islands marooned in this part of the lake; for according to the old legend, one of these was a floating island and so to chain one they chained all. The first island is Inch Murrin, at which I looked with due respect, for it is a deer park of the present

Loch Ness, Scotland

Loch Ness is renowned for its seldom-surfacing monster, "Nessie" for tourists. Theories abound regarding the beast's nature -- or lack thereof -- but one hypothesis fits well with what Chapter 22 tells us about organic floating islands. The region is one of peatland and an occasional upwelling of buoyant vegetation would be entirely possible, a la the periodic island of Derwentwater (Chapter 48).

Express Herald, July 15, 1951



Unlike Nessie, the "floating island" of Loch Ness was never much of a mystery, Richard Franck's Northern Memoirs (1658) describes the purported floating island to be little more than a mat of vegetation.

The famous Lough-Ness, so much discours'd for the supposed floating island; for here it is, if anywhere in Scotland. Nor is it any other than a natural plantation of segs and bulrushes, matted and knit so close together by natural industry, and navigated by winds that blow every way, floats from one part of the Lough to another, upon the surface of the solid deeps of this small Mediterrane.

And with poetic flourish.

Where the Tritons and Sea-nymphs sport themselves on the slippery waves, sounding an invasion to her moveable inmate; supposed by some, the floating island.

Some believed Eilean Muireach, or "Cherry Island," within the lough to have once floated. The islet's about 60 by 48 feet, 150 yards from the shore, at its highest, about 4 feet above the water surface with several fair-sized trees.

Eilean Muireach is, in fact, a crannog.



Loch Dochart, Scotland

From Observations on a Tour Through the Highlands and Part of the Western Isles of Scotland (1811) by Thomas Garnett,

In Loch Dochart, a lake in Perthshire, is a floating island, about fifty-one feet in length, thirty in breadth, and from three to four feet in thickness. The island seems to have been formed by the intermixture of the roots and stems of aquatic plants. It is frequently driven before the wind, and may be pushed with poles. Sometimes when it rests near the swshore, the cattle, tempted by the vedure of its grass, venture uponnit, and are often, by the sudden shifting of the wind, transported to the opposite side of the lake.

"Remarks on Scottish Scenery and Manners in 1819," Christian Observer, February 1820, adds the cattle story, which very well may have been true, but as cow-as-passenger has been attributed to so many floating islands, a degree of suspicion is always advisable.

Formed by the intertexture of the stems and roots of aquatic plants, and which is sometimes browsed by cattle. These, when it is driven on shore, embark upon it, and are not unfrequently indulged with a voyage around the loch.

Summary

We've confined our illustrations to observations of floating objects that, at least in the eye of the travelogue, evoked the noun "island," as opposed to the scores of mires, bogs and other waterbodies with floating vegetation not deemed to contain "island" substance.

We've endeavored to note today's condition of the waterbodies in question, and while indeed several support sporadic vegetative mats, none sport flotations approaching their vintage guidebook verbiage. A set factors may explain the perceived near-total disappearance of such islands

The regional ecology has altered.

Waterbodies are today managed differently

Vintage guidebooks aren't reliable scientific observations.

CHAPTER 52 LOOK UPWARD

To see more floating islands, gaze upward.

The floating islands seen in daylight are most likely metaphoric. Some of those seen at night have been thought to be physical.

Clouds



Upper portion of "Disputation of the Sacrament" (1509-1510) by Raphael.

The comments of William Lloyd, in "The Dispute of the Sacrament," Philosophy, Theology, and Poetry, in the Age and the Art of Rafael (1866),

The throne of Christ on the FLOATING ISLAND of clouds, borne up by seraphs, is slightly higher and then well in advance of those of the Virgin-Mother and John the Baptist, who are beside, and with seats turned towards him. His head is thus absolutely as well as perspectively super-eminent, and the whole figure is disengaged, and comes forward towards the spectator, and thus unites immediately and distinctly with the scene below, while the hemicycle of the beatified retires; the very immediate assessors help this effect by being attentive to but not regarded by him.

"A Dream," Ladies' Visitor February 28, 1820,

The following dream may not be destitute of amusement of instruction. Methought I was standing on the shore, the dash of the ocean billows against the distant horizon. While I was engaged in contemplating the grandeur of the spectacle, a cloud seemed to swim upon the vision -- it was a FLOATING ISLAND gradually approaching the shore on which I stood. I gazed and the spectacle at every moment became more defined and distinct as the island was approaching.

The ocean, intervening between the shore and the FLOATING ISLAND, became by the advance of a latter body, reduced until it was diminished to a narrow stream. I gazed on the island, and behind a purple light that seemed diffused all over its surface.

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Nehemiah Cleaveland. "An Air-Chateatl," The Bowdoin Poets (1849) by Edward Weston,

*How beauteous in the glowing west,
Those thousand-tinted ISLES THAT FLOAT
On the broad sea of light they rest,
Or pass to lovelier realms remote.*

"Imitation of Herrick. Cloud Faces -- That They Change," Harvard Magazine, July 1858,

*Ye fringe the coast of every ISLE
THAT FLOATS about the blue
Of April skies, and through
The warmth of April airs
I watch Your shifting forms, to catch
Each feature new.*

"Snow Flake," Geneva Gazette. February 21, 1862,

*I'm a wee bit sad for the clouds on high,
The soft white vapors that kiss the sky,
With their lip-like clefts of pearl.*

*Oh! mine was a fairy, a dream-like home,
A FLOATING ISLAND of sea-white foam,
Floating with graceful whirl.*

Henry Ellison, "Revelries of Nature," Mad Moments, or First Verse Attempts (1883),

*And mountain peaks, cloud-severed from their base
Like airborne ISLES THAT FLOAT amid the sky:
Some wood-crowned, others crag, with many a trace
Of lightning fire-furrowed; momentarily
They change their shapes and hues, as mists float by*

Jennie C. Morton, "Lost Island -- A tradition of a FLOATING ISLAND," Register, September 1903,

*So they floated out far,
'Neath the glimmer of star,
And the beams of a glorious moon;
Over sea waves so calm,
By the sky-reaching palm,
By flowery isles in sweet June.
Where ISLANDS, like clouds
Seemed to FLOAT in white shrouds,
And dissolved in the mist of the sea.
By lands that were fair,
And by climes that were rare,
But sorrow had marked every lea.*

Charles Smith, "Sunset from Mount Holyoke," Poems (1908), on clouds reflected on water,

*Far to the northward, linking shore with shore,
The river, sleeping,
Mirrored the delicate blush of clouds that before
The sky were sweeping.
And, at my feet, down with its swift tide flowing,
Seemed FLOATING ISLANDS,
For the clouds were rent apart where a wind came blowing,
Fresh from the highlands*

Aldous Huxley, Island (1962),

The green tunnel widened, brightened, and suddenly they were out of the dripping forest on a wide shelf of almost level ground, walled in on three sides by red rocks that towered up two thousand feet and more into a succession of jagged crests and isolated pinnacles. There was a freshness in the air and, as they passed from sunshine into the shadow of a FLOATING ISLAND of cumulus, it was almost cool.

Dimitris Tsaloumas, The Barge (1993),

To the Poet:

Your gestures have precision, yet they conflict with the manner of your speech.

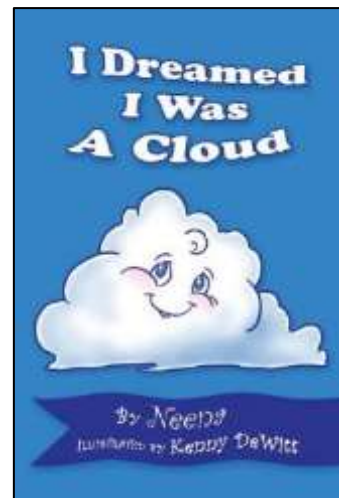
Your words are wine-purple ISLANDS THAT DRIFT below the bars of sunset cloud, when the heron leaves the autumn shore and night's only a mile away.

Stanley Plumly, "Perspective," American Poetry Review, December 2009,

*I'd just turned to consider
the blue cloud passing like a FLOATING ISLAND nation
on the opposite end of the sky, then
turned back only to realize how high the moon had traveled,
had, in no time, risen as if lifted.*

Review of I Dreamed I Was a Cloud (2009) by Neena in Children's Bookwatch, August 2010,

I Dreamed I Was A Cloud is the optimistic story of Billow the cloud, a DRIFTING ISLAND of kindly philosophy who encourages all the sad or disappointed people he observes to think of a better way to fill their lives.



The Heavens

What's seen at night (albeit with a telescope) may relate to floating islands, but as we shall see, the ties are varied. We'll begin with metaphors, Jupiter and Philadelphia, where the term is not metaphoric.

New York Evening Telegram, October 25, 1882,

A comet is a FLOATING ISLAND in the sea of space.

"From Politics to Stars," Cortland Standard and Daily Journal, June 30, 1892.

Science has not diminished the charm of the evening star. Although mythologic fiction, born spontaneously of the very aspect of Venus, has been dispersed like a thin cloud, astronomical reality is neither less beautiful nor less interesting. We know that this bright planet is a world like our own, almost absolutely the same as regards bulk, weight and density, and surrounded with an atmosphere higher than ours. We know that it gravitates like our FLOATING ISLAND in the light and heat of the sun, and that its brilliancy has no other cause than this reflected light.

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"A Peep into Space," Goshen Daily Democrat, August 31, 1916,

The fact that a fairly definite shape or outline has been found for the visible universe is in itself a proof that it is not unlimited in extent. We are virtually certain that it expands around us in such a manner as to assume roughly the form of a flat, irregular disk, the more distant parts or edges of which lie in the plane of the Milky Way. It is thus like a FLOATING ISLAND of stars in the ocean of space.

"Detached World," Troy Times Record, May 15, 1968, bodes ill.

A Princeton University scientist says that this earth is becoming a mess. Eventually we will have to move into space. He sets the date at "within 1,000 years."

We have no wish to live on a FLOATING ISLAND in space. We probably will not have to but the very prediction makes us uneasy.

Ray Bradbury, "Spaceship Earth," Disney Epcot, ride narration 1982,

Verged on the threshold of infinity, we see our world as it truly is: small, silent, fragile, alive, a DRIFTING ISLAND in the midnight sky. It is our spaceship, our Spaceship Earth.

"Runaway Universe May Collapse in 10 Billion Years, New Studies Predict." Stanford News Service, September 13, 2002, buys us some more time.

The recent discovery that the universe is expanding at an ever-increasing rate has led many astronomers to forecast a dark and lonely future for our galaxy. According to some predictions, the rapidly accelerating universe will cause all galaxies to run away from each other until they are no longer visible. In this widely accepted scenario, our own Milky Way will become an isolated ISLAND ADRIFT in a sea of totally black space 150 billion years from now.

Astronomer George Hough was the first to reference Jupiter's great red spot as a "floating island" in Annual Report of the Dearborn Observatory, 1882. As reported in English Mechanic and World of Science, August 11 of that same year,

The oval outline of the spot appeared as formerly, and the color reddish. This remarkable object, which is 30,000 miles in length and 8,000 in breadth, has not perceptibly changed in shape, size, or latitude during three years. It has, however, apparently drifted in longitude about 10,000 miles, or one and one-third times its length. A number of astronomers have imagined it to be the solid portion of the planet; but the drift in longitude disproves this supposition. It appears to us that it is more probably an immense FLOATING ISLAND of semi-cool matter resting a liquid incandescent ocean surrounding the planet. Such a condition of the surface would give great permanency, and still allow slow and gradual changes in both the position and outlines of objects.

"Recent Sights of Jupiter," Watertown Daily Times, March 4, 1896,

The great red spot which seems to have suddenly appeared in 1873, and has since remained, although faded from the first intense red tint to a dull brownish or grayish-red color, might be thought to be a permanent portion of the land surface of the planet if it had not lengthened its rotation period around Jupiter by six minutes since its discovery. Thus it evidently appears to be drifting in longitude at least. Is it a FLOATING ISLAND, rearing its half-cooled balk above still surging primeval form? It is as mysterious as the polar cornea or the doubting of the canals or Mars.

Headline in the New York Herald,
May 17, 1909.



"Jupiter, Mysterious Aster King of the Summer Night," Monthly Evening Sky Map, September 1912, by Camille Flammarion.

The most striking visible evidence of this action is furnished by the extraordinary movements of the famous red spot, a kind of FLOATING ISLAND which continues its peregrinations from meridian to meridian around Jupiter. In June, 1911, it was situated at the 325th degree of longitude, at the commencement of April, 1912, at the 306th and at the end of May at the 303rd degree. We can form an idea of the Immensity of the distance traversed by remembering that at the latitude of the red spot a degree of longitude corresponds to a distance of 1,162 kilometers. Now, in one year the FLOATING ISLAND of Jupiter has traversed twenty-two degrees of longitude, or 25,564 kilometers, twice the circumference of the earth at the equator.

This faraway planet, though bathed in the same solar effluvia which preserve youth and beauty on the earth, and which it receives from a distance of 775,000,000 kilometers -- five times the distance of the earth from the sun -- is, however, very different from our globe. It has an advantage over us in that it enjoys perpetual springtime on account of the feeble inclination of its axis of rotation. Nevertheless, this ceaseless springtime must be somewhat troubled by the extraordinary movements of the Immense Jovian atmosphere.

On the other hand, the weight of bodies at the surface of Jupiter is almost twice as great as that at the surface of the earth. A man who weighs seventy kilograms would weigh 150 there. We can scarcely imagine what would become of the Olympic games on the surface of the planet dedicated to the King of Olympia. A young girl of eighteen weighing fifty-five kilograms would weigh 122 on Jupiter, and, besides, she would be 213 years old, for the inhabitants of that planet would be centenarians at the end of their eighth year, each Jovian year being equal to more than twelve of ours.

And 46 years later, "Floating 'Island' Found on Jupiter: Great Red Spot in Planet's Atmosphere Appears to Consist of Mountains," New York Times, October 12, 1958,

Jupiter has what resembles an immense island floating in its atmosphere. It seems to consist of massive, brick-red mountains, occasionally whitened by ammonia snow.

This is reported by a meteorologist who has focused his attention on the weather of Venus, Mars and Jupiter. The feature on Jupiter, known as the Great Red Spot, has been in existence at least eighty years, but careful observations have shown that its position on the rotating planet is variable.

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And closer to home, "Gallop Island Balks Observation of Solstice," Philadelphia Inquirer, June 23, 1941, is about astronomers themselves.

To observe the scientists of Kelly Street at their work you... would have been obliged to journey to Lake Henry in Wayne County, where Mr. P.F. Cusick has set up a magnificent observatory on a floating island.

The Kelly Street scientists decided on the Lake Henry expedition for a definite purpose. They wanted to determine the feasibility of making astronomical observations from a moving base such as was provided in Mr. Cusick's floating island.

Shortly after the party of savants got aboard the island and all hands were looking through their glasses, a high wind swept across the lake and the island started to move. Not only did it move at a pretty good gait but it kept revolving and some of the scientists became very dizzy.



Mr. Lou White, president of Kelly Street, had his telescope trained on the exact spot where he figured the summer solstice would arrive, but a gust of wind turned the island and Mr. White got a fine view of a bevy of bathing beauties at a far corner of the lake.

Naturally there was confusion. No two agreed on their clocking of summer. One said it arrived at 8.15 A.M. From that time on, reports varied and at nightfall it looked as if a free for all fight would break out.

At the height of the discussion, about 3 in the afternoon, the floating island crashed into a pier belonging to a bird called Robinson and as it bounced back Jim Ervine, the leader of the Kelly Street Chorus, was catapulted into the water. He was hauled out by two tenors and a bass.

This island, by the way, is in itself a curiosity. For years it has been wandering around the lake always and ever subject to the whims and vagaries of the winds. When the wind is in the right direction lake side residents use it as a ferry.

As a curiosity it may have its good points but as a base for astronomical observation it's a flop. You need a solid, stationary foundation when you use a telescope or any other kind of glass. It's difficult enough to make an accurate observation under the best conditions, but when you try to do it from a floating island you're bound to have trouble.

As for what's fanaticized in the sky, consult Chapter 81.

CHAPTER 53

FLY THE FLAG

What flag should fly above an island floating in international waters?

International law tends to derive from actual situations which must be individually addressed, as opposed to broadly-defined hypothetical concerns. Over-riding jurisdictional principles may (or may not) evolve from smaller disputes brought before the bench.

Sources of international law include:

Customary practice, i.e. the law of nations,
Treaty law, and
International conventions.

We'll consider each, as it might apply to floating islands.

Customary law stems from analogy within a particular legal system, rarely suffice for international extension. Chapter 55, for example, discusses American boundary law as applied to transitory islands on U.S. waterways.

There are no treaties dealing with floating islands.

The 1958 Geneva Convention of the High Seas, the international agreement now in force, makes no mention of floating islands.

Thus we can only speculate as to which source of law might apply when weighing a dispute related to a floating island, and even a more speculative speculation, to what degree such a finding might establish precedent.

That which follows, we're fully aware, is imaginative jurisprudence. With that caveat, we suggest a few approaches to determine an unfooted island's legal footing, so to speak.

Territorial Limits

The 17th-century "freedom of the seas" concept limited national maritime rights three nautical miles from a nation's coastlines, the "cannon shot" logic. Waters beyond were international, free to all, but belonging to none.

By the early 20th century, nations began to extend their claims to include mineral resources, protect fish stocks, and provide means to enforce pollution controls. Using the customary international law principle of a nation's right to protect its natural resources. In 1945, President Truman extended American control to all natural resources of its continental shelf. By 1967, 66 nations had established a 12-nautical-mile limit and eight had gone to 200 miles, a distance that in accord with Article 60 of the Geneva Convention of the High Seas, is today claimed by most coastal nations.

The nearest coastal state thus has jurisdiction of islands, floating or otherwise, within 200 miles of its shore (Article 56, Geneva Convention of the High Seas). Only that state may authorize their construction or alternation (Article 60). Such islands are not considered to extend that nation's territorial waters or exclusive economic zones.

One needn't be a legal scholar to recognize the problem associated with creating or towing -- it matters not which -- a piece of land in the territorial waters of another nation and declaring independence. It's been tried several times.

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Giorgio Rosa constructed the Isle of Roses, a platform 8 miles offshore from the Italian coast, in the early 1960s. After a storm swamped the effort, another structure was erected in 1965, 4,000 square feet, boasting several businesses. Italian authorities took little notice until 1968 when Rosa declared the platform to be independent nation. Two months later, the platform was occupied by the Italian Navy, who obliterated the new nation with dynamite.

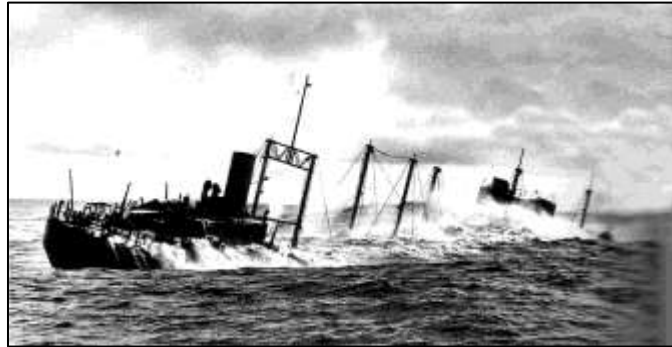
The United Kingdom tolerates Radio Caroline, a now-and-then offshore pirate broadcaster since the mid-1960s. As unilaterally interfering with the station might be seen as a violation of the freedom of the high seas, the Her Majesty's government has turned to the Consultative Assembly of the Council of Europe for increased regulatory authority. The BBC occasionally replays Caroline tapes to celebrate British Rock.

The legal debate between the Dutch government and off-shore radio stations Radio Veronica and Reclame Exploitatie Maatschappij ("Advertising Exploitation Company") pursued the distinction between ship and artificial island in the 1960s. REM was deemed to be an "artificial installation" mounted on piers resting on the sea bottom. Police action was taken. Due to its potential mobility, on the other hand, Veronica was said to be a ship, for which the government has other legal prescriptions.

New Atlantis was founded on an 8 by 30-foot platform in the Caribbean by Leicester Hemingway, brother to Ernest. The supposed "nation" had eight crowded citizens during its brief independence in 1964, but was destroyed by fishermen salvaging it for lumber. As the thieves did not retrieve the Ford engine block tethering the platform, proof remains of a nation that physically floated.

In 1969, promoters bought the surplus WWII concrete cargo ship SS Jalisco - in 1969, renaming it the USS Abalonia, with the intention of sinking it in shallow waters of Cortes Bank, 115 miles off of San Diego, and declaring it an independent nation.

Shortly after launching, however, the vessel broke into three parts and sank in deeper water than expected.



In the fiasco's aftermath, a second company began plans to build a platform on the Cortes Bank and declare it the nation of Taluga. The US government quickly served notice that the Cortes Bank, as part of the continental shelf, fell within its jurisdiction.

From the promotional literature,

The Celestopea sea communities will involve the creation of a worldwide series of very prosperous, autonomous, self-sustaining, floating ocean villages with populations between 2,000 to 5,000 people. Each community will be actualized with innovative technologies that create buildings and even islands from the minerals held in solution in seawater. This same technology, along with construction of Ocean Thermal Energy Converters will have the capacity to add new land mass to burgeoning population coastal areas, as well as provide abundant supplies of high protein food, pure water and renewable, pollution free energy to raise the quality of life throughout the world

In 1966, the Atlantis Development Corporation endeavored to establish Atlantis, Isle of Gold, a haven off southeast Florida for offshore banking. The Corps of Engineers forbid the construction, citing the agency's authority over the Outer Continental Shelf. The corporation defied the ban for a period before it was destroyed by a hurricane.

A second company, Acme General Contractors, recommenced without approval and the United States filed action on the grounds that,

1. The area was under the jurisdiction of the United States and as such the defendants action constituted trespass, and
2. The activities violated the Rivers and Harbors Act of 1889 and the Outer Continental Shelf Lands Act of 1953.

The original Atlantis group also filed suit, stating that Acme was trespassing Atlantis property. The court ruled against ownership by either company, but allowed that since the U.S. did not actually own the Outer Continental Shelf, but only had jurisdiction, there could be no recovery based on trespass.

The British World War II football-field-sized Fort Roughs, 13 kilometers off of Suffolk was abandoned until 1966 when a DJ named Roy Bates moved there, declaring the oceanic fortress to be the Principality of Sealand. Bates designed a flag and invested himself as Prince.

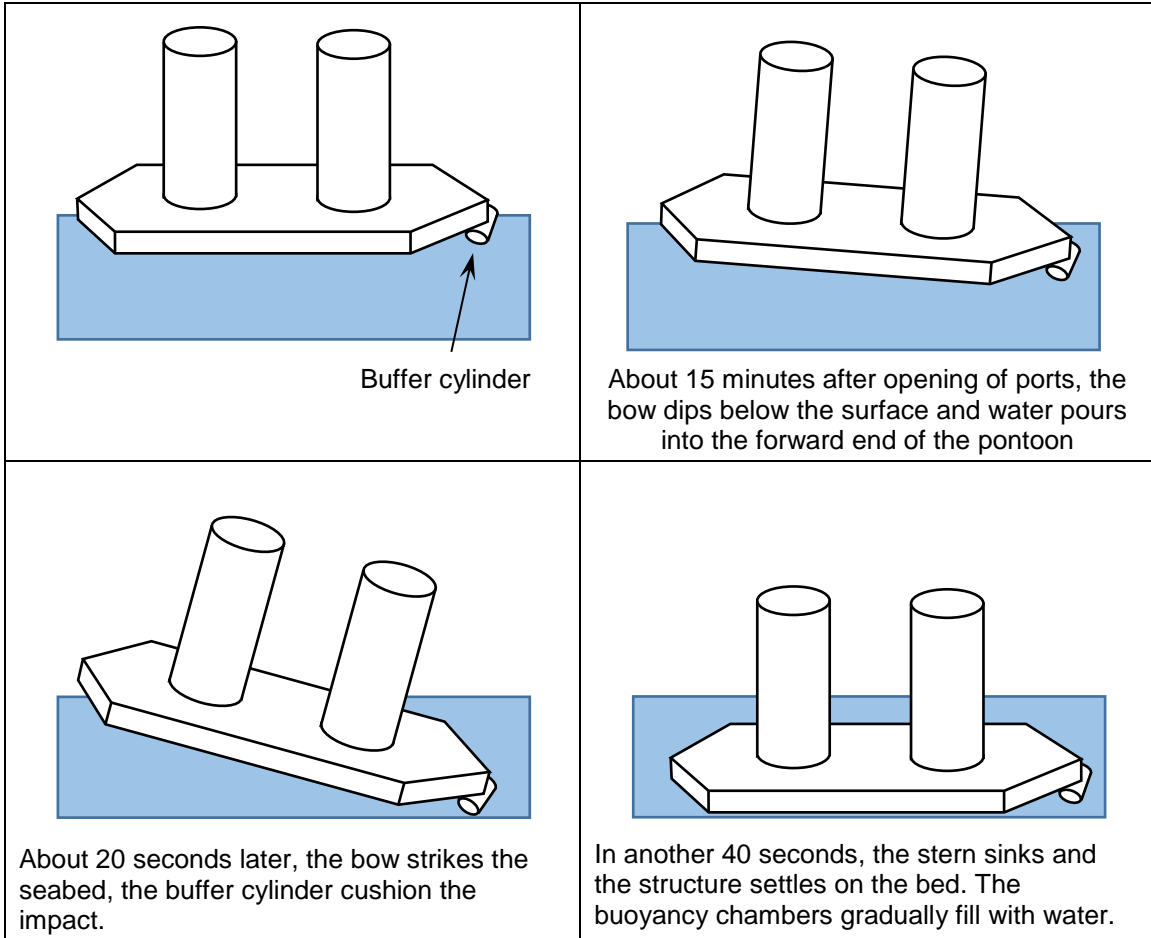
While Sealand has yet to enter into relationships with other nations, it maintains some success as a British brand name.



Several incidents have supported the Principality's claims of independence. Sealand fired warning shots at a nearby repair boat, who took King Roy to British court over the matter. The court ruled that the tower was outside of the court's jurisdiction. When German rivals briefly attacked the platform and were captured, one was kept as a prisoner for several weeks, during which period the German government appealed to the British government for help. The British Foreign Office said that the tower was beyond their jurisdiction.

The 7-story structures, of which there were four, were 108 feet tall and weighed 4500 tons. They were laid down in dry dock, assembled as complete units, outfitted with twin 3.75-inch anti-aircraft guns and twin 40 millimeter Bofors guns, towed and sunk into position in 1942.





The 120-man crews proved effective in fending off German aircraft. The Thames fort alone shot down 22 aircraft, 20 V-1 flying bombs and an enemy speedboat.

Declared sovereign in 1972 by Americans businessman Morris Davis, the Republic of Minerva consisted of two tide-submerged coral reefs, 17 miles apart, 200 miles from Tonga. A ship was engaged to provide 2500 acres of landfill, which if one does the math, makes a landform 17 miles long and a quarter of a mile wide. Davis placed a stone monument on one end at low tide. Minerva would attract a population of 60,000 where citizens would have "no taxation, welfare, subsidies, or any form of economic interventionism." Landfill ceased, however, before investors were secured and coins minted.



Tonga expressed intent to build nearby artificial islands with a territorial sea including that claimed by the Republic of Minerva.

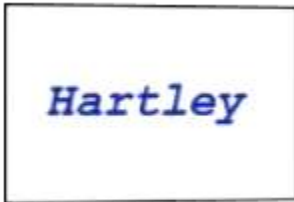


Unfortunately for Davis's republic, Tongan King Taufa'ahau Tupou IV set sail with his prisoner-constituted Tongan Defense Force, tore down the monument and proclaimed sovereignty.



His Majesty King Taufa'ahau Tupou IV in Council DOES HEREBY PROCLAIM: WHEREAS the Reefs known as North Minerva Reef and South Minerva Reef have long served as fishing grounds for the Tongan people and have long been regarded as belonging to the Kingdom of Tonga has now created on these Reefs islands known as Teleki Tokelau and Teleki Tonga; AND WHEREAS it is expedient that we should now confirm the rights of the Kingdom of Tonga to these islands; THEREFORE we do hereby AFFIRM and PROCLAIM that the islands, rocks, reefs, foreshores and waters lying within a radius of twelve miles thereof are part of our Kingdom of Tonga.

The Minerva conflict is since dormant. When the reef emerges once in a decade, the King sends an emissary to replant the Tongan flag.



Revealed in 2004 by the melting ice of a retreating glacier in the archipelago of Svalbard, Nyskjaeret, "Nowhere Island," is roughly 80 meters long, 40 wide, and 10 high, and consists of moraine rubble on bedrock.



"Landmark Moment: Artist Claims Sovereignty of New Arctic Island," The Guardian, May 12, 2006,

There is no unemployment, no crime and no hospital waiting list. The nation of Nymark, with its unspoiled views and its quiet evenings, free of antisocial behavior and traffic noise, shines like a beacon in these troubled times. Now all that Nymark's 43-year-old leader is seeking is recognition from the United Nations and, of course, a decent entry for the Eurovision Song Contest.

Nymark, situated in the Svalbard archipelago in the Arctic, was discovered by London artist Alex Hartley in 2004 when he was part of an expedition of scientists and artists collaborating on a project to highlight global warming.

Mr. Hartley was told by the Norwegian Polar Institute that if he wanted to name the island he would have to choose a Norwegian name, hence Nymark, which means New Ground. After returning to England, out of curiosity he started exploring the possibility of getting micro-nation

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status for his discovery. He applied to the United Nations and is still waiting to hear from it. In the meantime, the Norwegian government responded, challenging his sovereignty claim.

The Norwegian Polar Institute later conceded to Hartley's choice of a name, Nyskjaeret, but as the formation lies within Norwegian territory, Hartley doesn't get to be ruler.



2004



2011

Having lost the protection of the glacier, the island is now eroding, a third of it having disappeared back between 2004 and 2011. At that rate, the island has but 10 to 15 years left.

Fixity

Law pays more attention to the location of an event or entity than to capacity for mobility. The statehood of an island rooted to the earth can generally be resolved by a map. "Sovereignty and Mandate Boundary Lines of the Islands of the Pacific," National Geographic, 1921, reflects the end of an era when such cartography was regularly pursued to garner yet-to-be-discovered islands.

As international law appears to make no distinction between fixed and floating islands, there would seem to be little jurisdictional difference between an island fixed upon the seabed, a buoyant body temporarily tethered to the bed, or something in between, say a vertically-floating body laterally constrained by piles. Were there no attachment whatsoever, jurisdiction at any time would still be determined by location.

Floating Island Theory

Floating Island Theory has little to do with floating islands, per se; it's about ships. Floating Island Theory holds that the jurisprudence of the banner under which a ship sails governs in matters relating to those on board.

Let us begin with a morally-satisfying legal passage from "Slaves in the Colonies. A Copy of Any Information Which May Have Been Received by His Majesty's Government, Respecting the Case of a Person Residing in the Island of Antigua, Named Grace James, Claiming to be Free, But Whose Claim Has Been Disputed," House Of Commons Papers 333 (1826).

Now, suppose a person who had been a slave in one of our own West India colonies escaped to such a country, he would thereby become as much a freeman as if he had come into England. He ceases to be a slave in England only because there is no law which sanctions his detention in slavery, for the same reason he would cease to be a slave the moment he landed in the supposed newly discovered island. In this case, indeed, the fugitives did not escape to any island belonging to England, but they went on board an English ship, (which for this purpose may be considered a floating island), and in that ship they became subject to the English laws alone. They then stood in the same situation in this respect as if they had come to an island colonized by the English. It was not a wrongful act in the defendants to receive them; quite the contrary. The moment they got on board the English ship, there was an end to any right which the plaintiff had by the Spanish laws acquired over them as slaves. They had got

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beyond the control of their master, and beyond the territory where the law recognizing them as slaves prevailed.

When they got out of the territory where they became slaves to the plaintiff and out of his power and control, they were by the general law of nature made free, unless they were slaves by the particular law of the place where the defendant received them. They were not slaves by the law which prevailed on board the British ship of war."

Note the "an English ship, (which for this purpose may be considered a floating island)." As noted in Chapter 47, "floating island" had by then long used to describe large ships. The metaphor legally appeared without amplification in a Crown ruling two years predating "Slaves in the Colonies," and almost immediately gained judicial usage.

The Merchant Shipping Act of 1854 granted jurisdiction to English courts over British subjects charged with having committed any offence on board any British ship on the high seas, or in any foreign port or harbor, and over any person not being a British subject, charged with having committed any offence on board any British ship on the high seas.

Queen v. Anderson (1868), a British case in which James Anderson, an American, had been indicted at the Central Criminal Court for murder on board a vessel of Nova Scotian ownership, registered in London, and when the vessel was on the river Garonne, within French territory. The prisoner appealed to the Court for Crown Cases Reserved that the British court lacked jurisdiction because he was an American citizen and in a foreign country at the time of the offense, what would seem to be a straightforward interpretation of the Merchant Shipping Act.

The Court sustained the conviction, however, concluding,

Being a British ship was under the circumstances, "a floating island," where the British law prevailed ... The only consequence of the ship being within the [area] of French territory is, that (the vessel not being an armed vessel) there might have been [coexisting] jurisdiction, had the French law claimed it.

As summarized by Justice Blackburn:

A ship which bears a nation's flag is to be treated as a part of the territory of that nation. A ship is a kind of floating island.

Floating Island Theory peaked in the 1800s, but has been sinking ever sense. As pondered in "Notes," Journal of the Society of Comparative Legislation 2:3, 1900.

It is a curious and startling result -- technicality triumphant, but if technicality is to prevail, why should not the ship, as a floating island, carry with it a three-mile zone of territorial waters?

The U.S. Supreme Court has pointed out that stepping onto a U.S.-flagged vessel is not legally the same as entering the United States. In *Caltex v. State Of Kerala* (1961), an Indian High Court ruled that a foreign vessel was not exempt from local taxes when in port.

The concept of a floating island is only a metaphor, and the fallacy lies in mistaking the metaphor for a manifestation.

An Indonesian fishing vessel illegally transporting passengers from Java to Australia broke down in Australian territory and all were rescued by a Norwegian vessel. Australian police boarded the ship four miles from port and arrested the passengers.



Those arrested contended that the rescue ship was part of Norway and the requirements of the Extradition Act had not been satisfied. The court noted that ship was not a foreign warship, but a private vessel which entered Australian waters illegally and affirmed the arrests.



The current Encyclopaedic Dictionary of International Law summarizes Floating Island Theory as,

A theory, now discredited, that public vessels of any State were to be assimilated with the territory of that State while on the high seas.

Were, however, Floating Island Theory to stage a comeback and the merchant-ship model of maritime registration deemed applicable, a constructed island floating on the high seas might be subject to its nation of registration. An unregistered island would suffer the condemnation dealt to a rogue steamer. A floating island of natural origin -- the argument might be extended -- flies the flag of the terrain from which it tore loose.

There's still a place for Floating Island Theory, but it's rather distant. The 1967 Principles Governing the Activities of States in the Exploration and Use of Outer Space treaty specifies that a space object's country of registration

Shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body.

Finders-Keepers

In common law, goods lost at sea fall into four categories: wreck, flotsam, jetsam, and ligan.

To be legally be wreck, the goods must come to shore.

Flotsam is property lost at sea, but still awash.

Jetsam is sunken goods thrown overboard to save the ship.

Ligan is sunken goods tied to a buoy to facilitate future recovery.

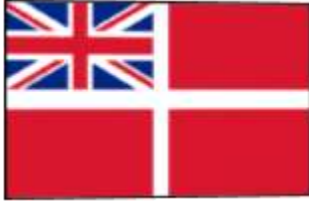
In early common law, wrecked goods belonged to the king. A wayward floating island, on the other hand, at least to the degree that it can be said to have been "property lost at sea," is flotsam, which according to the Rules of Oleron (c. 1266), "if it be precious stones, fishes or any treasure of the sea, which never belonged to any man in point of property," is adjudged to the first finder.

The Eastern District Court of Michigan -- we're reverting to "customary practice" -- agreed in 1889, though the ruling confined itself to only shipwrecked goods.

If found on the shore, they are a wreck and belong to the king; but if they are found in the sea further off from the shore, then whatever has been found shall belong to the finder, because it may be said to be then no man's goods; the king no more than a private person.

The Age of Discovery was fueled by what European nations took to be a right of dominion over newly-discovered territory. Finders-keepers might apply to a floating island, though as the waves continue to beat upon its edges, there's likely less and less for the finder to keep.

The same might be said for insular upheavals. In July 1831, a pumice island (Chapter 30) rose to the surface off the coast of Sicily. The HMS St. Vincent planted the Union Jack on the 60-meter protrusion, claiming it for Britain and naming it Graham Island. The Sicilians did likewise, naming it Firdinandea. France and Spain were close behind.



Crown Colony of Malta



Sicily

The ensuing diplomatic dispute ended when the island sank back into the Mediterranean in December, but the confusion remains, as suggested by the unofficial 2000 coin bearing the island's Italian name, the bust of Queen Elizabeth II and an English denomination.



Raising the Flag

Dominion by unfurling a flag has been long championed by those less bound by legal foundation. We begin with a dispute in New York involving the unfurling of a blue, "Who Owns Mystery Island in Lake?" Fulton Patriot, May 9, 1963,



The floating mystery island, the "Atlantis" of Lake Neatahwanta, isn't really a mystery at all the Patriot learned this week. The only mystery surrounding the gadabout chunk of floating real estate seems to be its ownership.

Several weeks ago, a piece of island about the size of half a city block broke away from the western shore of the lake during a windstorm. The "Atlantis" was seen traveling across the lake in a south-easterly direction powered by the high winds.

The floating island finally came to rest about fifty yards from Stevenson Beach in the lake and speculation about how it got there has run through the city for weeks. Spectators have been lined up on the lake shore viewing the new-born island through binoculars.

Who owns the "Atlantis" of Lake Neatahwanta? The City of Fulton where it now rests? The Town of Granby from whence it, came? Or does it belong to the Forward with Fulton committee which has staked it out with a big blue banner? Nobody seems to know.

Chapter 53 -- Fly the Flag



The Great Lakes, with their peaty banks, have a rich history in floating island flag-pinning.

We've three examples, each of expansionist Americans trying to wrest a bit of floating real estate from Canada.



"A Floating Island in Lake Ontario," North American and United States Gazette, July 31, 1858, is our first illustration.

A large object was seen in Lake Ontario in a north-westerly direction from Pultneyville [New York], gently floating to the eastward. It excited considerable curiosity, as it appeared unlike anything ever seer: on the lake before. As all had a desire to know more about it, several young men, in boats, started in pursuit, and after a sturdy pull with oars, it was at last overhauled some five miles from shore. It was steadily wending its way down the lake, impelled by the current at the rate of three miles an hour, and when overtaken presented to the astonished beholders a no less novel spectacle than an island covered with luxuriant vegetation. It was about five rods in length and nearly of equal breadth; and had, probably been formed in some quiet nook of a river or bay, upon some timber or brush that had become stationary under the surface of the water, till an admixture of earthy and vegetable matter had accumulated, sufficient to nourish vegetation, inch as is peculiar to swampy locations.

These had grown and fallen through a long succession of years, until the whole had become matted together by roots and fibers so as to give the whole mass a firmness and tenacity sufficient to resist the waves, and a specific gravity that enabled it to float. The late rains increasing the volume of water where it formed, elevated it from its bed, broke it from its moorings and sent it off on a voyage of discovery.

The whole island was covered with such plants as are seen about Irondequoit bay, and had much such an appearance. It was sufficiently firm to bear up a man -- as Dr. Beardsley stepped on shore and took possession in behalf of Uncle Sam.

As Lake Ontario's international boundary was established by treaty in 1783, raising Old Glory north of the demarcation was in fact a brief local invasion.



Another flag-waving account, this one from Lake Superior, for which we quote from Duluth and St. Louis County, Minnesota; Their Story and People (1921), by Walter Van Brunt,

One day in 1870, it [a portion of Fremont township] broke from its moorings and passed through the canal. Those that saw it depart perhaps suspected that it purposed to sail to foreign shores, there to eventually become an expatriot, or be naturalized against its will. At all events, Walter Van Brunt, the city clerk of Duluth, and Charles F. Johnson, of the Customs House, determined to intercept and interrogate Fremont, then rapidly nearing open water, and in case they could not prevail upon it to recognize its responsibility as a town site by turning again

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homeward, then they would at least see that it departed assured of the means of identification and of the protection of its homeland, when it reached foreign soil.

With that intention, these two earnest and loyal citizens of Duluth took a boat, intercepted the itinerant island and, their arguments not availing, one of them climbed to a high branch of one of the tallest trees of Fremont Island and lashed "Old Glory" firmly to the stout limb. The wanderlustful island then continued on its heedless way, leaving the two men to gaze at the flag of the United States fluttering in the breeze, thirty feet above the water-line.

The next morning they knew that they had gone to unnecessary effort, a change in the wind during the afternoon, or night, having effected a change of very many points in the course of the voyaging island. Indeed, that easterly storm cast the island upon Minnesota Point, where it soon disintegrated, thus preventing perplexing litigation among town site owners.

Our third flag-planting episode is on Lake St. Clair, between Lakes Huron and Erie. Due to the location of the lake's inlet, the St. Clair River, and its outlet, the Detroit River, Canada owns the southern portion, and the United States, the northern portion. Before we raise the flag, however, we'll note a few of St. Clair's floating island sightings.

"That Floating Island," Detroit Free Press, August 7, 1876,

On Saturday afternoon, the steamer Evening Star, upon her trip to the Star Island House, ran out to the floating island of Lake St. Clair, giving the excursionists a fine view of the wonder. It moves but very little, and lies about five miles south of the canal, and perhaps two miles to the eastward of the main course of vessels. Its size is some 600 to 800 feet in length, and from 100 to perhaps 300 feet in breadth.

It is evident that there is little or no soil on the floating mass, but it is composed almost wholly of tall grass and an accumulation of roots and vegetable mass beneath. It is quite doubtful whether it would sustain the weight of a person and in all probability a good sharp gale would very soon break it up. From whence so large a mass of vegetable matter has come, or how it came to be detached from its former resting place is somewhat of a mystery. Doubtless the long continued high water has much to do in detaching it from its place of growth.

"The Floating Islands," Oswego Daily Times, August 14, 1876,

The Detroit Free Press says: "The floating island in Lake St. Clair has floated to within ten miles of the lighthouse, and is directly in the route traversed by vessels entering Detroit River."

Chicago Tribune, August 19, 1876, in its entirety,

The floating island in Lake St. Clair is said to have gone to pieces

History of the Saint Clair River (1921), by Emeline Crampton,

A floating island of about the size of two city blocks was reported by Capt. Dan Morrison in July 1878. It was covered with grass and would have made a nice farm for someone who could have found a place to anchor it.

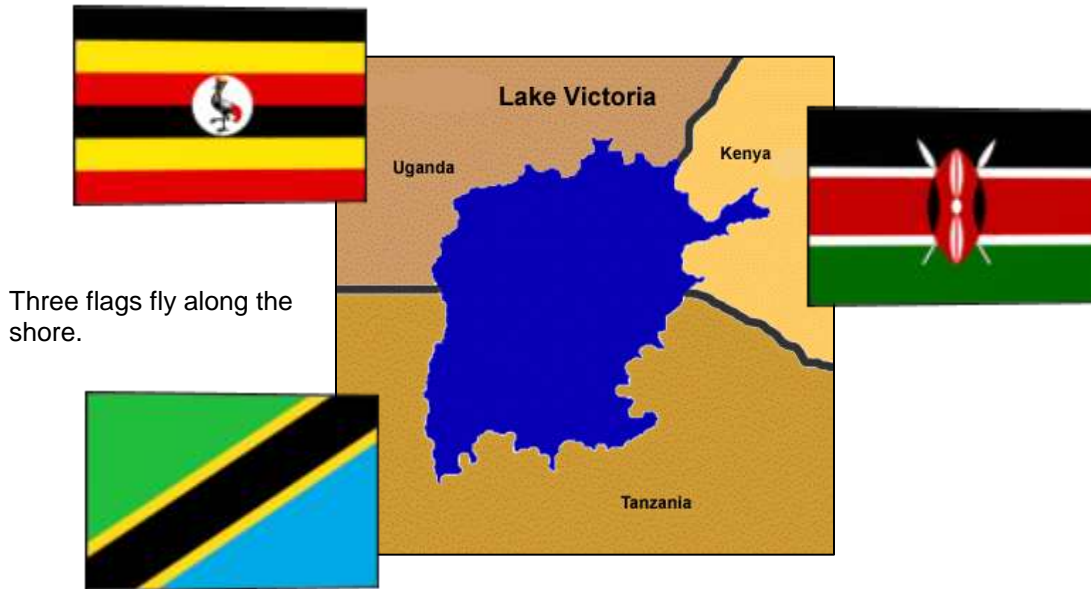
"The Floating Island," Crown Point Register, August 31, 1876, is not clear on whose half a floating island floated, but when in doubt, unfurl the banner.

The floating island continues to attract mariners who pass it in crossing Lake St. Clair, and also from the residents of this city, large numbers of whom have taken passage in one of the Star Line steamers for the express purpose of viewing the phenomenon. The island remains intact, with the exception of one section about fifty feet square, which follows after the main body as it floats with the current or is driven by the wind. Yesterday, it was reported that it had been shifted by the wind to within five miles of the canal, and a short distance out of the route of passing vessels. Masters of vessels who have not been informed in regard to the island, on viewing it for the first time mistake it for the mainland, and are momentarily startled at their supposed variance from the proper course. The American flag was placed on the island on

Chapter 53 -- Fly the Flag

Saturday last, by Emory Wendell, and it has been named Jewell's Island, in honor of the ex-Postmaster General, who was among the first to visit it.

Floating mats of Papyrus and Miscanthidium extend into East Africa's Lake Victoria. Mat thickness varies from 0.5 meters in papyrus rafts to 1.8 meters in Miscanthidium.



Three flags fly along the shore.

As to which flag flies over an island freely floating upon the lake, we turn to "The Ugandans Living on an Island Floating in Lake Victoria," [BBC News](#), June 25, 2015.

A piece of land has broken off Uganda's mainland and has been floating around Lake Victoria for close to four months. The BBC's Patience Atuhaire met the artists who have set up home there.

As we approach the island, the first thing that stands out is the Ugandan flag on an improvised pole high above the greenery.

Resident Labatin Mwiima says the flag pole acts as a reference point, by which to judge how far the 20-acre island has moved. "You wake up in the morning and see different scenery. One evening we went to sleep at Port-bell Landing site, and we woke up in Ggaba," he says.



Mr. Mwiima says a friend lured him to come to the island. He is a reggae musician and finds the environment relaxing and good for creativity.

It is not clear whether by coincidence or design, but all 10 of the island's occupants are artists.

Ali Katongole, a painter, says he was drawn to the island because of its simple lifestyle, away from the hustle and bustle of a big city like Kampala. Fittingly, it is called Mirembe, which means peace in Luganda.

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The residents are all men, living in grass-thatched huts. Some live there permanently, while others paddle local canoes every few days to go back to their homes in Kampala.



The residents say the idea that the island might get submerged doesn't occur to them, because you cannot actually feel it moving.

But Geoffrey Kamese from the Uganda Association of Professional Environmentalists, who has visited it, expresses caution.

"People should be careful and not continue farming on it, because the soil could become even weaker and sink in," he warns.

Neat gardens of cassava, maize, beans and even bananas share space with the natural vegetation.

The ground is soggy, and most of the crops are planted on mounds of soil, with ditches full of water running in between. Wild birds and chickens thrive on the bounty provided by the swamp vegetation.



The National Environment Management Authority say people are risking their lives and has warned people to stay off the island

And the islanders say they are ready to go wherever the waves carry them.

Discovered Territory

In common law, goods lost at sea fall into four categories: wreck, flotsam, jetsam, and ligan. To be legally be wreck, the goods must come to shore, while flotsam is property still awash at sea. Jetsam is sunken goods thrown overboard to save the ship and ligan is sunken goods tied to a buoy or cork in order to facilitate recovery. In early common law, wrecked goods belonged to the king. A floating island, on the other hand, at least to the degree that it can be said to be "lost at sea," is flotsam.

According to the Rules of Oleron (c. 1266), property found at sea, "in floods or in rivers, if it be precious stones, fishes or any treasure of the sea, which never belonged to any man in point of property," is adjudged to the first finder.

Given the absence of rulings to the contrary, finders-keepers would indeed seem to apply to a floating island discovered in international waters, though as the waves continue to beat, there tends to be less and less worth keeping.

Construction on the High Seas

Foreign feathers get ruffled at signs national expansionism. Seadrome advocates (Chapter 57), for example, advised the Public Works Administration that a transoceanic airway might rank with the Panama Canal as a part of America's contribution to world transportation, but when League of Nations advocates suggested that such seadromes must remain neutral in case of war, Uncle Sam objected.

Article 87 of the 1958 United Nations Convention of the High Seas grants any state the right to construct an island of the high seas and prohibits state action against such endeavors. According to Article 60, however,

Artificial islands, installations and structures do not possess the status of islands. They have no territorial sea of their own, and their presence does not affect the delimitation of the territorial sea, the exclusive economic zone or the continental shelf.

Existing law thus would seem to allow any nation to build and float an artificial inland as an agent of itself in international waters, exactly as it might do with a battleship.

Declaration of Independence

Can private colonists claim sovereignty over a floating island, albeit an island they built or an island they discovered?

Indeed they can, though the criteria is difficult. International law requires that a state possess the following qualifications:

- A permanent population;
- A defined territory,
- A government; and
- Capacity to enter into relations with other states.

Implicit in the above is inhabitation. A floating islands inhabited by castaways satisfy none of the criteria. Not only would colonizers have to persist over an extended period, they would need to keep their territory from invading another.

As there might be money to be made from mining the sea, artificial islands -- floating or otherwise -- might someday be part of such efforts, and might arguably constitute such a new nation. As with most matters, law included, money talks.

An artificial island tends to be high-priced real estate, but if such an address frees its inhabitants from the burden of taxation, the very rich may find it to be real estate worth possessing.

Verne's Propeller Island (1895), also titled The Floating Island, or The Pearl of the Pacific (Chapter 12), is based on the concept, but not all speculation is pure fiction, as illustrated by the question raised in Libertarian Brian Doherty's "20,000 Nations Above the Sea. Is Floating the Last, Best Hope for Liberty?" Reason. July 2009,

Pay Pal founder Peter Thiel is a backer of the Seasteading Institute, which seeks to found sovereign nations on oil rig-like platforms beyond the reach of the law-of-the-sea. Such countries could start from scratch, free from the laws, regulations and moral codes of others, particularly those without wealth. Thiel has funneled \$1.25 million towards the planning.

A few proposals



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The schemes not without its detractors, of course. From "Logistical Challenges of Floating Libertarian Paradises," Deep Sea News, February 2, 2015,

A short list of some of the technical problems they will no doubt face when living in their tax-free utopia.

Constant maintenance. The battle against rust is continuous, and requires considerable organization... Even with constant maintenance, everything breaks at sea, and it always seems to be the part that is least expected.

Severe weather. According to the Seasteading Institute FAQ, they have a pretty minimal plan for dealing with severe weather. Certainly there's nothing wrong with moving out of the way, but storms and associated wind and waves are not always avoidable or predictable. Size alone is no refuge.

Sewage and trash. Apparently the seasteaders intend to abide by the same maritime laws as large ships, while simultaneously staying relatively close to shore. Well, that's nice – but where are they going to put their sewage and garbage? Presumably this libertarian paradise would not be located in any country's Exclusive Economic Zone, so it would have to be more than 200 miles off the coast, which would make discharging raw sewage legal.. Discharging plastic is illegal at any time, so they would need to hold their trash until they could ship it back to the mainland, where they will have to find a facility that can take it.

The Wags

"Year's Delay Sought on U.N. Site," Philadelphia Inquirer, December 16, 1946,

It was nearly 10 P.M. when David Wilson, New Zealand's easy-spoken delegate, supplied the inevitable comic relief.'

Wilson jokingly proposed, to soothe both East and West Coasts, that the U.N. might build its home on a floating island, tow it through the Panama Canal and alternate sites each year.



"Israel: Bits, Bytes and Bombs," New York Times, March 23, 2013, by Thomas Friedman,

Ari Shavit of the daily Haaretz captured this mood in his column the other day, which began: "A few months ago Amnon Dankner published a sharp, amusing article in the new newspaper Sof Hashavua. He described how Shimon Peres's innovative technological project causes Israel to detach from the Middle East and sail westward through the Mediterranean Sea, like a sort of FLOATING ISLAND.



Laughter aside, Dankner nailed the spirit of the time. In recent years Israel has been feeling, thinking and behaving as though it is no longer located in West Asia and can exist as an island that has broken off from it. As if there was no Arab world, no Palestine, no Iran. No Arabs, no settlers, no occupation."



The April 1, 1977, Guardian commemorated with a seven-page supplement, the tenth anniversary of the independence of Britain's last semi-colony, the island republic of San Serriffe.



The republic an archipelago consisting of two mam islands -- the northerly Caissa Superiore, round in shape, and Caissa Inferiore, also round but with a promontory extending southwestwards with the overall appearance of a semi-colon.

The supplement explored the geography, history, government, cuisine and sport of the new republic, San Serriffe's leader, General Pica, its capital, Bodoni, its major port, Port Clarendon and its acclaimed Ampersand String Quartet.

Updates appeared in the Guardian on April 1 of later years, covering such news as the island's thriving computer industry, based in Arial.

A peculiarity of the islands is their floatability. They were initially sited off Tenerife, were properly surveyed when in the Indian Ocean, and April 1, 2006, found them off the South Island of New Zealand.



Peter Preston, Guardian editor in 1977, was inundated with complaints from travel agencies and airlines claiming disruption to business from customers wishing to book flights, not realizing that the islands' origins were in printing terminology.

We missed it at first, but now we get the "semi-colony."

Conclusions

We've several approaches by which we might determine a floating island's proper flag.

- Territorial limit,
- Fixity,
- Floating Island Theory,
- Finders-keepers,
- Flag raising,
- Discovery
- Construction,
- Declaration of independence

None seen immediately fruitful, however, but one might someday steer legal evolution.

In any case, the particular flag itself may be misleading, as illustrated by the game BioShock Infinite which takes place on the sky island (Chapter 81) Columbia, created in the 1890s

"To demonstrate to the world by example the founding democratic principles of the United States, the product of American ideals, endeavor and industry."

The floating island has since armed itself and after an unfortunate international incident, retreated to the clouds where everything has gone haywire.

On further thought, that may be what's also happening below.

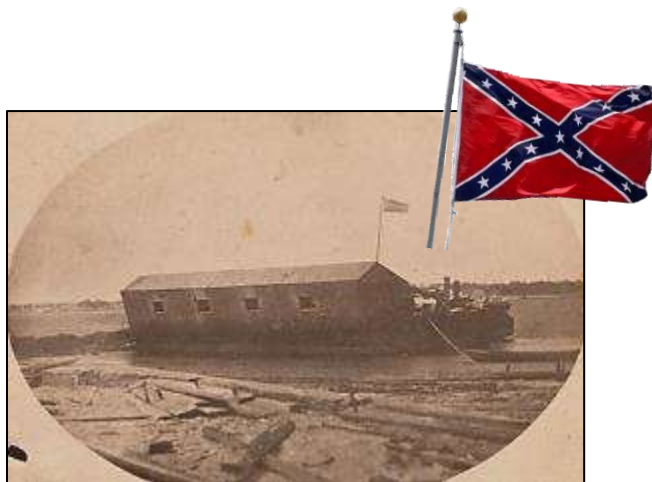


CHAPTER 54

WHISTLE DIXIE

Prior to the outbreak of the Civil War, southern troops constructed an ironclad floating battery in clear view of the Union forces at Ft. Sumter. The floating island was 100 feet long, 25 feet wide, and sheathed in two layers of iron plate. Flying the first Confederate flag, was towed into position and fired on the fort on April 12, 1861.

The floating battery's armor was later stripped for reuse on navigable warships.



Our interest in the floating islands of the Confederacy, however, is more directed toward natural features, ones that for the most part can be seen yet today. We will look at several sites in Florida's St. Johns River Basin, the Okefenokee and Everglades swamps and the Mississippi River Deltic Plain.

St. Johns River Basin, Florida

Floating rafts of vegetation in Florida lakes are known as "tussocks." These can be divided into "mud tussocks," in which a large amount of organic matter is held within the root mat, and "floating-type tussocks" with little or no soil matter. The latter tends to be dominated by smaller plants.

Control of aquatic vegetation in the St. Johns River is discussed in Chapter 82. Here, we'll look at the islands themselves.

The condition of Lake Griffin at the end of the 19th century is described in "Improvement of Ocklawaha River, Florida," Annual Report of the Chief of Engineers, U.S. Army (1891).

For a distance of 28 miles from Lake Griffin the river flows through a prairie or marsh covered with a growth of saw-grass. The impediments to navigation in this portion of the river are the numerous bends, narrow channel, floating islands, and eel-grass. There are no snags or overhanging trees. As a rule, the river is very crooked. The available mid-channel depth at ordinary low -water is 5 feet; the average width is from 30 to 40 feet. From Lake Griffin to within a mile of Starke's Landing the bank on either side is a floating marsh with very irregular edges. This marsh is covered with a growth of saw-grass and lily pads, whose roots form a solid homogeneous mass about 2 feet thick. When the river rises the edges of this marsh break away and float down the river, forming what are called floating islands. These islands become jammed together, usually at the first sharp bend or shoal, and navigation is completely stopped - The progress of the survey was stopped at a point about 2 miles below Pine Bluff, where there were several packs of those floating islands inside the space of 1 mile of river.

Before navigation can be resumed, these packs must either be cut away in piece meal or each island must be towed downstream to a suitable point and fastened to the river bottom by

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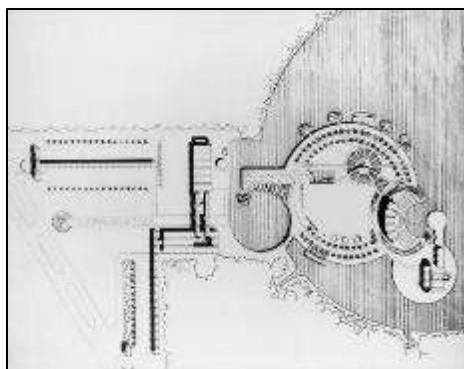
stakes. As long, however, as these islands are allowed to enter the narrow river, they will stop it up at some point.

B. Franklin Adams and his boat, "The South Wind," hauled citrus from Emeralda to Leesburg in 1919. He wrote about his exploits in An Adventure on The Oklawaha River Florida (1926).

There is a post in the marsh that marks the mouth of the creek, but coming from the south it is hidden from view by a bushy point and the entrance is hard to find. Haines Creek is the 'home' of floating islands, and every time you enter it the channels through the floating vegetation are altered and you don't know where you are at."

Plans in the 1950s called for a resort to be called "Florida's Floating Islands." The motel, marine theater, convention- size auditorium, 200-foot tall needle-point tower and Indian floating island performance would lure tourists en route from Silver Springs to Cypress Gardens.

Frank Lloyd Wright drew the first set of plans.



1953 Site Plan"

As announced in the "New Tourist Attraction," Palm Beach Post, October 10, 1953,

Leesburg is soon to have a showplace many think will be to the Lake County town as Silver Springs is to Ocala. A high-powered enterprise known as Floating Islands Corporation is now at work on a 120-acre tract north of town. The corporation is investing dollars -- 500,000 of them as a starter -- and horticultural know-how in one of the most colorful Sunshine State attractions, those large masses of flora that sit for a while atop Leesburg lakes, then drift off on their own.

When the project centered about the wandering islands is completed, it will feature aerial gardens with the exotic wild orchid and other air plants; the world's largest sun dial made of growing shrubs and flowers; a marine theater; formal gardens; a convention auditorium; a motel and resort-type cottages on the lakefronts. What Cypress Gardens has done for Winter Haven is, the founders think, what Floating Islands can do for Leesburg.

An update: "Baroque Formality in a Florida Tourist Attraction," Interiors, January 1954,

Architect Paul Rudolph intends to enliven one 180-mile stretch in the interior - between two of Florida's most popular sights, Silver Springs and the Bok Tower - with an amusement center and tourist attraction where the main feature is Florida flora growing from earth materials supported by masses of floating roots commonly called "floating islands." The site has a 1000-foot frontage on two U.S. highways and easy access to a fresh water lake where fishing is excellent.

For entertainment and recreation there will be a variety of exotic floral displays, grandstand shows of swimming and diving, and boating and water skiing on the lagoon which leads to the large lake and then a string of lakes and canals for boat excursions.

As the facility was being designed, two of the backers died and their heirs chose not to continue.

The Evening Independent, March 30, 1976, brings us to date concerning Lake Griffin and its authentic floating features.

If you can't go to an island, wait long enough and one will come to you. Fishermen on Luke Griffin and Orange Lake in Central Florida barely but an eye ns an island goes floating by. Newcomers hesitate to believe their senses on seeing the phenomena.

The floating land masses go merrily on their way, with lofty maple, loblolly, elder or myrtle trees as their masts and the foliage as their sails. Some of the trees are 25 feet high,

Some islands are only inches high and several feet long. Others vary in diameter to several hundred feet and in depth from 8 to 10 feet.

How are they formed? The islands begin from small clumps of roots or matted grass which have sunk to the lake bed. During high water or hot weather they are forced to the surface by the formation of gas. Gradually vegetation takes hold and trees and plants start growing.

According to geologists, floating islands are common throughout the world where subtropical conditions of heavy rainfall and hot humid weather prevail. In Florida the lakes of both central and southern areas of the state are most likely to have floating islands. The largest and most prevalent islands, however, are to be seen on the two lakes.

Some of the floating islands are solid enough for people to walk on. Others can hold birds or lightweight wildlife.

Two likely debarkation points of viewing floating islands are at Lake Griffin State Recreation Area near Leesburg and the Marjorie Kinnan Rawlings Park overlooking Orange Lake at Cross Creek, south of Gainesville.

"I coulda' been a contender," Marlin Brando, "On the Waterfront" (1954)

"I coulda' been Disneyworld," Florida's never-to-be Floating Islands resort.



Lake Griffin today

Lake Hellen Blazes, the "Daffiest Lake in America," as described in the Saturday Evening Post, July 12, 1952.

A small island the size of an ordinary living room, but complete with grasses, brush and a few young trees, apparently got tired of our intrusive company and began sailing down the lake away from us!

The tree-grown island—which was a good 100 yards out in the lake when he started fishing — has somehow crept up to the firmly anchored boat and is hovering over it, belligerently trying to shove it out of the way.

Hellen Blazes is about a mile long and not quite that broad at its widest part. Its numerous islands range from tiny things about the size of a dinner plate to a half acre or more in area.

"See that little thing?" said Cotton, pointing an oar at one of the midget islands, "That's a complete island, even if it's no bigger'n a bushel basket. It's formed around a cabbage-palm hammock that floated here from Lord knows where. It has soil on it, and see those tiny plants growing, and the grass blades, and even that bit of brush starting? Nothing's likely to happen to it back here where there are no choppy waves, and it'll grow bigger, until someday it'll have deep soil with trees on it unless it gets washed downstream in a flood. Hurricanes and floods break up some of these bigger islands or this whole lake eventually would be covered with floating earth."

We drove our boat right up on one small island and drifted around with it for a time while casting for bass. It was about fifteen feet in diameter, large enough to start growing trees. We also sent our host gliding up on the solid-seeming "shore" just for the experience. The mainland shore looks like solid, though muddy earth, but you realize it is afloat when the boat sinks it. Cotton took an oar and shoved it down through the "earth" without encountering any resistance.

In the realm of floating islands, the St. Johns Basin or elsewhere, Lake Helen Blazes is no daffier than the rest, but a magazine needs to tout its features.

Lake Hellen Blazes



The floating islands of Orange Lake are best known through the efforts of naturalist and entrepreneur Don McKay who provided guide services from the 1930s to the 50s. Chapter 37 includes McKay's experiences in walking on the lake's floating islands. Chapter 82 makes mention of his occasional need to battle one.

Postcard featuring McKay



Orange Lake has an open water surface area of approximately 14,000 acres, surrounded by Nymphaea floating marsh, some of which is over a mile wide. Depth reaches 25 to 30 feet. The water is brownish or greenish due to suspended detritus, zoo- and phytoplankton. The bottom is a thick layer of autochthonous silt and plant detritus, in some places is compact, overlying sandy clay and limestone.

Floating islands varying in size from a few feet to several acres support abundant stands of vegetation whose roots penetrate a dense matrix of decaying plant detritus of peat. McKay saw the winds push them three-plus miles a day. One roamed the lake for ten years.

Pickerel weed and arrowhead are probably the most characteristic hydrophytes, although many islands support dominating growths of twig rush, smartweed or spatterdock with elder, willow and myrtle. In season, color is added to the islands by the flowers of arrowhead, spider lilies, hibiscus, and the ubiquitous water hyacinth.

Raccoon, round-tailed muskrat and marsh rabbit swim from island to island. Egrets, ibises, herons, gallinules, red-winged blackbirds, grackles, and water turkeys are some of the more characteristic breeding birds associated with floating islands.

The Louisiana newt and the striped mud-eel can be found among the submerged roots. Hylid frogs and bullfrogs occur in varying numbers. Stink-jim turtles nose around submerged roots while cooter sun on logs above. The lizard Anolis carolinensis is at home on islands hundreds of

DRAFT 3/30/2018

feet from shore. The topminnow, least killifish, and darter, usually considered littoral or bottom forms, are found around the edges of islands. Black crappie make their redds under the edges.

George Reid, "Some Considerations and Problems in the Ecology of Floating Islands." Quart. J. Fla. Acad. Sci. 15(1), 1952, offers three hypotheses for island formation in Orange Lake, all of which may be correct.

Fluctuations in water level float the dense tangled masses of vegetation bordering the water, and, once floating, the mats are made lighter when the bottom of the mat is scraped against the lake bottom.

The buoyancy of air chambers in the roots of plants broken off from the outer edges of the littoral marsh and incorporated into the islands.

Gas accumulation from decomposition of peat-like material composed mostly of *Nymphaea* roots.

"Allyn Visits Floating Islands of Orange Lake," St. Petersburg Times, October 22, 1941 provides a layperson's version of the above.

This is the way it starts and finishes.

A certain plant on the lake becomes imbedded firmly in the lake bottom, then as it grows and puts out shoots for more plants to grow, the bulbs in these roots generate a gas. They swell up and get lighter and lighter.

Finally one day the whole mass with its roots imbedded in the lake bottom rises to the surface and brings a good chunk of the soil under the lake with it. This floats like a raft and at first is rather sloppy looking. Grass seeds are blown over the island and take root, finally weaving the whole into a compact island so strong a person may walk about without danger of falling through.

Like all things on this earth, the day of reckoning finally comes. That's the time when some little bugs attack the bulbs supporting the island and start to eat them up. One day the bulbs collapse and the whole island sinks to the bottom of the lake from whence it came.

That's the day when all the rabbits on the island learn to swim.

Letters from the Frontiers, an Account of Army Life in the South in Pioneer Days (1868) by George McCall provides the earliest mention of the floating islands.

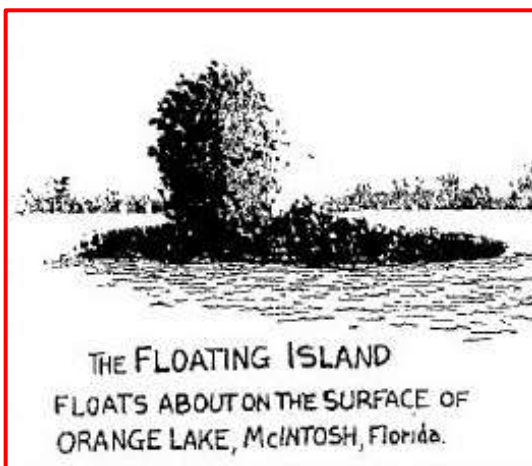
We reached the shore of Orange Lake, that fairyland of gorgeous vegetation. What a charming view was presented to my eyes! As the sun was past the meridian, I lingered only a few minutes to look at a green island which at a distance of half a mile raised its head above the bright waters.

The following morning, I looked out upon the lake when, to my no little surprise, the island I had observed the previous day had disappeared and, on further examination, the water of the lake seemed to have receded from the shore nearly a hundred yards. It was not until I walked down to the lake that I discovered that the island I had noticed the day before had drifted with the wind against the shore where I stood. These floating islands, as I afterwards learned, found in many parts of Orange Lake, are formed by the growth of a strictly speaking "water-plant."

Of this singular plant the roots do not fix themselves in the earth, but float upon the surface of the water, deriving all their sustenance from that element -- or rather I should say fluid -- and the carbon of the atmosphere. As the individual plants are brought in contact by the motion of the water, their roots, which are long and ramous, become interlaced, and in time, as they grow and increase and multiply their branches, become firmly united and compact as a mat. Upon this floor, as it were, the foliage as it falls becomes decomposed, and at length forms, in fact, a little soil, upon which the seeds of other plants dropped by the birds vegetate and spring up ;

some of them even at this season rearing their spikes of yellow flowers above the rest of their associates.

The floating island featured in Ripley's Believe It Or Not, February 9, 1937, according to McKay, supported a maple two feet in diameter and 30 feet high that became so heavy that it broke through the island bottom. We don't believe it.



From Florida, A Guide to the Southernmost State (1939), Federal Writers' Project of the Work Projects Administration,

The naturally formed "floating islands" in this group vary in diameter from a few feet to several hundred, and in depth from 3 to 10 feet. They are formed from small clumps of roots, or matted grass, which have sunk to the bed of the lake, and during high water or hot weather have been forced to the surface by the formation of gas. Grass, aquatic plants, and weeds have grown on the islands; there are many elder, myrtle, and maple trees 25 feet high. This vegetation acts as sails, causing the islands to move when a breeze springs up. The birds of this region never lose track of their nests, although their home island may float to a different part of the lake at any time. Among the birds are American and snowy egrets, heron, ibis, anhinga or American snakebird, and gallinules. Early Indians believed that souls of the dead buried on these islands reached the 'Land of the Sure' when the islands sank.

"One-Man Nature Center," Nature Magazine, February, 1948, by Edwin Way Teale, is largely based on a visit with McKay.

Less than twenty miles south of Gainesville, Florida, the main highway skirts Orange Lake. If you swing to a side Toad here and drive half a mile east, you come to one of the most interesting natural history spots in North America, Don McKay's one-man Nature center on a lake of floating islands.

The unique "floating island" boat... is 26 feet long and 9 feet wide. Flat-bottomed and with a tunnel stern, it can carry 25 passengers and still navigate in two feet of water. Both bow and stern are squared off and provided with steps so visitors can obtain close-up views of life on the floating islands.

From time to time, the boat plows through areas where the surface of the water is thick with the great, flat leaves of the yellow pond lily or spatterdock. When McKay pulls one up, the stem comes out of the water like a long green cable, six or seven feet from end to end. These stems ascend from thick, spongy roots, sometimes 25 feet long, embedded in the mud of the lake-bottom. It is these roots that form the raw material of the most dramatic feature of Orange Lake-its floating islands.

Crisscrossing in the mud, the roots form an almost solid mat. Sometimes as much as a quarter of a mile across. They are buoyant with gases. Occasionally, during a storm, one of these mats will break loose and rise to the top, carrying a section of the lake bottom with it. Thus, a floating island is born.

One of these wandering islands on which I stepped has been drifting about the lake as long as McKay has known the region.

Bushes and even trees grow on the larger islands. One cypress tree reached a height of 12 feet and a water maple rose even higher. If a tree gets too big, the ground under it is unable to support its weight and it drops through a hole into the lake: In other instances, where high bushes and trees have risen on a relatively small land-raft, winds have heeled the whole island over in the manner of a capsized sailboat. I saw the edge of one floating mass that looked as though it had been turned up by a plow. The wind had tipped over a line of bushes along the edge, curling up the whole side of the island.

When a breeze is blowing, bushes and higher vegetation on these unanchored islands act as sails, and the masses drift as much as three or four miles in a single day.

The islands are natural derelicts and change their positions continually. McKay once anchored down a floating island by means of cables and concrete blocks. That kept it in place for a while, but finally it broke free and resumed its drifting.

"Lake of the Floating Islands," North with the Spring (1951), also by Teale, provides additional description.

Later we examined some of these roots. More than a foot in circumference and extending, sometimes for more than 20 feet, they suggested large pipes or water mains running beneath the mud of the lake bottom.

Sometimes, at Orange Lake, anglers will become so engrossed in fishing in some bay of an island that they will not notice the approach of a drifting islet until it has bottled them up, turning the bay into a lake temporarily surrounded by land.

McKay has seen a cypress 12 feet tall on one island, and a solidly rooted water maple 18 feet tall on another. In certain rare instances a tree may become too large for the island to support. A water maple reached a diameter of more than a foot. Then suddenly the ground gave way beneath it. It plunged downward a dozen feet to the bottom of the lake, tearing a hole from the



center of the island, its top rising from the opening like a twig thrust through the hole of a floating doughnut.

A sinkhole in the 1950s drained about half the lake. Concrete, old cars, and the like was dumped in to clog the leak and allow the water level to recover.

"Florida's Fantastic Floating Islands," Coronet, February, 1961,

Ordinary breezes are capable of moving the islands, but a big blow like Hurricane: Donna of September 1960, completely changes all their positions. Some are casualties, going down like ships at-sea. Others break up into smaller units. Still others get temporarily bigger, sometimes reaching several acres in size, as two or more collide and hook together.

When there us any violent disturbance of the water, some roots break loose, tearing others from their moorings. The mass, maybe 3 to 5 feet thick, then rises to the surface and another island is born. As yet it has no plants on it, but the warm Florida sun acting on the rich lake bottom mud carried up with the roots, soon takes care of that a sod of floating marsh, as much as a mile wide in places, break off in sections and join the squadrons roving the lake.

"Floating Islands' and 'Bird Island Scenic Cruise," Ocala Star-Banner, October 7, 2009

Some of the islands wandered so far across the lake that they got lost and it became necessary to offer a reward for their return to the vicinity of the docks. One of the most interesting of these islands was "brought back' in response to the following "ad" which appeared in the Ocala Star.

"Reward. Lost- A Famous Floating Island" featured in Ripley's 'Believe It Or Not.' This island is floating "somewhere" on the lake and a substantial Cash Reward will be paid to the person or persons locating and towing it within a half mile of our docks."

The naturally formed, "Floating Islands", were from 8 to 10 feet thick, and solid enough to walk on.



Postcards of the floating islands in Orange Lake

Efforts to control infestations of the non-native hydrilla in the 1990s (see Chapter 82), as well as clearance of obstructions by the state to assist fishermen in 1998, have the lake some of its islands. A 2000 sinkhole nearly drained the lake, further destroying the formations. Today's tussocks are few and tattered.



According to "Analysis of Floating and Emergent Vegetation Formation in Orange Lake," November 1998,

Connectivity of roots to underlying mineral sediments has been identified as a critical factor inhibiting the formation of floating islands in deep marsh communities. Weakening of the connection between Nuphar luteum roots and mineral sediments can result in the formation of floating islands because of the net positive buoyancy characteristic of deep marsh communities. In the recent past, Fluridone spraying for Hydrilla with resultant damage to Nuphar luteum appears to have weakened the connectivity of Nuphar luteum roots, resulting in the formation of organic based floating islands.

47% of the 62 [vegetative] species identified were found associated exclusively in floating habitats. Eleven percent of these were considered true free floating aquatics...which do not require the development of a vegetative or organic sediment substrate to become established. The remaining 36% of species were found exclusively on floating substrates and were considered dependent on this community for establishment.

Okefenokee, Georgia, and Everglades, Florida

Though the Okefenokee and Everglades are not contiguous, they are similar in geomorphology. Wooded islands are known as "houses." Floating peat islands are known as "batteries," "blow-ups" or "pop-ups."

Peat islands emerge in the two swamps form when masses of peat accumulate enough methane and carbon dioxide to become buoyant. Sometimes more than a quarter acre and up to six feet thick, these floating islands form a base for shrubs and even large trees.



The Okefenokee derives its name from the Native American phrase "land of the trembling earth."

"Narrative of a Cruise to Lake Okeechobee", American Museum Journal, December 1919, by John Small, provides a glimpse into the swamp a century ago. Even then, the environment was suffering from human infringement.

After we reached the Everglades several stops were made along the banks for collecting. The first was on the southern bank of the canal at the head of what was formerly Pelican Lake. Four years ago this lake was one of the most beautiful spots I had seen. When cruising in Okeechobee in 1913 we spent an afternoon and a bright moon light night in Pelican Lake. Then it was filled with floating islands of the water hyacinth and water lettuce. It was surrounded by beautiful pond apple hammocks which were fringed with a growth of water hyacinth and water lettuce made up of plants more robust and larger than had previously been recorded. The hammock islands served as immense heron rookeries and the waters abounded in alligators of all sizes. Today it is a waste. The lowering of the waters of Okeechobee has changed these conditions and, instead of the paradise described, the exposed bottom of the lake as far as the eye could see supported a dense growth of the large pigweed "careless" (Acnida). The sight was disheartening.

Today, at least, more is being done to preserve the resource. The Loxahatchee National Wildlife Refuge has some 4,000 batteries which can have a surface up to a meter above the water line, colonized by such woody plants as wax myrtle and swamp bay, the margins fringed by Cladium and wetland ferns. As the batteries anchor to the bottom by, the climax community can become an ombrotrophic cypress dome.

Peat deposits as thick as 15 feet cover the Okefenokee's sand bottom, and methane gas produced by the decay of sunken vegetation periodically propels large chunks of this compressed organic matter to the surface. Disturbance of the rootstocks of aquatic lilies and arrowhead by alligators and snapper turtles may be a trigger mechanism.

To give a sense to the process, an excerpt from a canoer's web posting,

First time I saw it was a bunch of bubbles coming up I thought a turtle was rooting around. (could have been) Then out of the bubbles, below the surface of the water I could see a "shape". There was something underwater twice as long and twice as wide as my canoe! And it was swimming straight toward me! Then "bloop" the mud showed itself. Two days later it was covered with grass.

Most of the peat mats, some as long as 100 feet, sink back to the bottom, but a few rapidly undergo succession to shrubby greenbrier tangles and then to swamp forests populated with bald cypress, loblolly bay and black gum.



Tree islands have formed in the Everglades within the past 1,300 years, a relatively recent addition to the greater ecosystem. While there is ample evidence of floating islands rooting into the bed -- we've noted the process in any number of peat-bed lakes elsewhere -- here there may be an anthropogenic explanation as well. Archeological surveys of tree islands reveal pottery, broken shells, animal bones and charcoal in concentrations suggesting that some islands may

have grown upward as ancient refuge dumps, as opposed to growing downward in the manner of a peat island affixation.

Many floating islands move laterally, sometimes just a few meters from the emergence depression, but rarely more than tens of meters because there's little room to maneuver. Wind is the main mechanism, at least for more distant movement, with sawgrass and brush acting as sails. Pop ups give rise to "alligator holes" or similar depressions when they are displaced laterally.



Flotant of the Mississippi River Deltic Plain

The Mississippi Deltic Plain is the region of the Louisiana coastal plain where the Mississippi and the Atchafalaya rivers fan out as they approach the Gulf. The deltic plain is not to be confused with the Mississippi Delta alluvial plain, some 500 kilometers inland.

The marsh is called "flotant," or sometimes "la prairie tremblante," tightly entangled plants and roots mixed with peat. Flotant may be thin, unable to support the weight of a person, or may be thickly vegetated and solid enough to walk upon. Jumping up and down, however, invites falling through. There are some 160,000 hectares of flotant in the deltic plain.



Let us discuss some of the particulars.

Maidencain mat floats throughout the year, its movements tracking ambient water levels. The dense upper layer, 20 to 30 centimeters deep, consists of intertwined live and dead roots binding decaying root matter.



Below, a peat zone develops at 30 to 50 centimeters, penetrated by a few live roots. The underlying lens of free water varies seasonally but is typically 50 to 80 centimeters deep, though the mat may rest on the bottom during drought conditions. In some cases, the flotant overlies "fluid organic ooze" rather than clear water.

The flotant of Lake Boeuf, dominated by maidencain, is firm, its upper 20 to 30 centimeters a mass of intertwined live and dead roots. Below this active root zone for another 20 centimeters, the active roots are fewer and the root mass is more decomposed and finer in structure. The mat rests on a layer of water that was usually clear. As the bottom of the mat decomposes, peat separates and falls to the underlying substrate, forming a bed layer of peat sludge. The mat floats freely year-around several centimeters above the water surface except when water level is extremely low. Mature wax myrtle forms dense over-story 8 to 10 meters high.

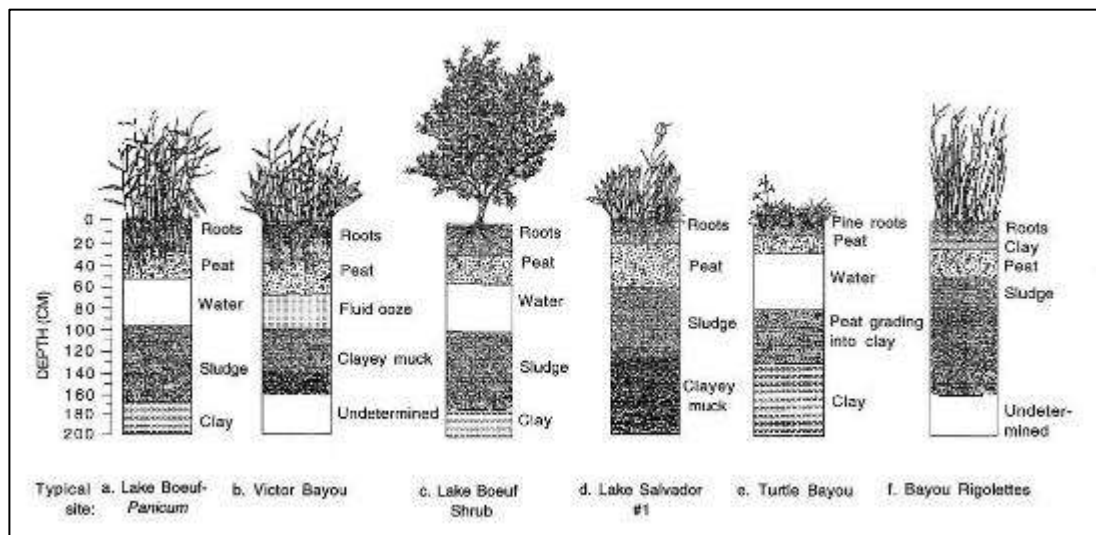
Maidencain and wax myrtle-dominated marshes float all winter and maintain with thick reddish mat of dead grass on the surface. *Sagittaria*-dominated mats, on the other hand, may submerge in winter. The *Sagittaria* decomposes rapidly after it dies in the fall, leaving the marsh with scattered clumps of vegetation through the water.

Spike-rush flotant is thinner, rarely more than 30 centimeters deep including the detritus layer. A short, dense sward of sedge binds the upper layer. The mat is suspended over watery peat and clay layers to a depth of 130 centimeters, depending on season.

The vegetation of the thin flotant of Turtle Bayou marshes dies to the ground in the fall, and the area resembles an open shallow lake until the mat begins to refloat in late spring. The root zone is about 15 to 20 centimeters thick. The mat and free water overlay a decomposing organic peat layer that grades into clay with depth.

Though we earlier noted that flotant in the deltic plain tends not to anchor, there are exceptions, the Bayou Rigolettes marsh, while "quaking" under foot, being one. The marsh is dominated by the low salinity marsh species *Spartina patens*, "salt marsh hay". Woody plants, most often wax myrtle (*Myrica cerifera*), but occasionally, small cypress trees, can grow under some conditions.

A few corings,



Unlike the Okefenokee and Everglades, however, where the waterbody for the most part is quiescent, discharge through the deltic plain is always seaward. When one of the many finger-like breaks in the flotant closes, another opens, the net effect being a mat in relentless reformation. Unlike the Okefenokee and Everglades, which in a successional sense, can become marshy woodlands, the deltic plain serves as a myriad of randomly-morphing passageways for the major rivers, providing the mat less likelihood of rooting, and more likelihood fragmenting and possibly being swept into the Gulf.

From Thomas Richards' The Romance of American Landscape (c. 1854),

The same author to whom I am indebted for this anecdote, tells us of a visit he made to Lake Solitude, one of the crescent-shaped bayous formed by old deserted bends of the river. There is, he says, in this lake a floating island, well wooded, on which a friend of his once landed from a canoe, when, to his surprise, it began to sink with his weight. In great alarm he climbed a cypress-tree, which also began immediately to go down with him as fast as he ascended. He mounted higher and higher into its boughs, until at length it ceased to subside; and, looking round, he saw, in every direction, for a distance of fifty yards, the whole woods in motion. Sir Charles, wishing to know what foundation there could be for so marvelous a tale, found that, during floods, large floating logs had entered the lake by the channel which at such times connects it with the main river; that these logs had formed a raft which had become covered with soil, supporting shrubs and trees. At first, this green island was blown from one part of the lake to another by the winds, but a cypress springing from the soil had sent down strong roots, many yards in length, so as to cast anchor in the muddy bottom and thus enable the poor island to settle down in peace and quietness.

In some portions of this low country, especially near Attakapas, there are wide tracts of floating lands, called "quaking prairies." Cattle are pastured here, and you might imagine yourself on good terra firma, unless you should happen to dig down for a couple of feet, when you would find sea-fish quietly disporting in the subterranean waters.

John Worrell, A Diamond in the Rough: Embracing Anecdote, Biography, Romance and History, Western Americana (1906), regarding Louisiana,

On the morrow I set out with livery for a twenty-five-mile drive down the Vermillion River to within a few miles of the Gulf.

Having a nice yacht, Mr. Nunes took me a sail around his plantation, and while making the trip I came to know for the first time what is meant by "floating island," or "floating land." Bordering the Gulf, and its bays, in many places, where the lands are low-lying and marshy, owing to the nature and heavy growth of the marsh grass, it extends out over the water and forms a sod, somewhat similar to that on marsh land. Through the centuries of the past the growth of blade of this marsh grass has ripened and fallen until there has formed a sod, or thick tuft of blade and root, from one and a half to three feet thick, which extends far out over the water. This, in some places, acquires sufficient strength for cattle to graze over it, which they do, and instinctively know enough not to venture too far out. If a hole be cut through this tuft of sod, one may fish successfully under this "floating island."

From "Flotant," Geographical Review 32:1, January 1942, by Richard Russell,

Flotant, ordinarily translated "floating" by the French trappers of southern Louisiana and anglicized as "floating marsh" by the Americans, is a type of coastal marsh formed along most of the abandoned channels and in many of the low basins between the natural levees of both inactive and active stream channels of this part of the state. It is a significant step in the evolutionary sequence through which open water is converted into firm land.

On one side of the flotant lie mats of floating vegetation covering areas that should be considered water. On the other side lies roseau marsh, firm under foot, valuable for trapping, subject to burning, and essentially land. Although widespread, flotant, in its typical forms, is, to an amazing degree, cultural in origin. More than half of it seems to have formed since the turn of the century.



Summary

We've visited three regions of the Confederacy.

Florida's St. Johns River Basin contains numerous waterbodies in which the combination of floating peat and vegetation yields explosive bursts of floating formations.

The swamps of the Okefenokee and the Everglades, on the other hand, are ecosystems more steady-state in nature. Rooted mats and transform themselves into fixed forests, albeit exceedingly wet ones.

Flotant of the Mississippi Deltic Plain, prone to drift at the whim of the myriad of sea-bound meandering passages, is less likely to transform into a stable island.

CHAPTER 55

CONSULT A RELATOR[®]

Having devoted a chapter to law in the international arena, we now turn to legal issues closer to home, those particular to real estate. We'll consider four aspects of floating island ownership that may or may not be on the Relator[®] licensing examination.

Islands that float from one location to another,
Real estate that shrinks at one end and grows at the other,
Taxes, and
Permits.

Deeds to Mobile Real Estate

Carroll Brewster, editor of Sudan Law Journal and Reports, describes the situation in Sudan, a nation long-accustomed to shifting riparian property.

You cannot understand a Nile land case without understanding how the river behaves. As it rises and falls in its annual cycle, fertile land in the riverbed is arable for seven or eight months, then disappears again beneath the water. One year a particular tract may fail to reappear and the owner loses his land. Five years later, land appears again in that same place. Does the old owner still have rights to it? If he is dead, who does have rights to it? Perhaps an island has vanished under the flood. It reappears a quarter of mile downstream in slightly different form. Does the owner of the lost island own the new one?

Past rulings in northern Europe provide contrasting opinions.

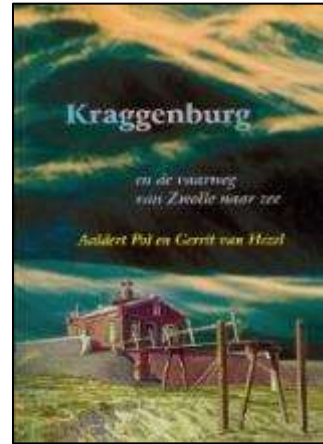
Saxo Grammaticus' Danorum Regum Heroumque Historia (1216) states fields in Frisia Minor carried by floods belong to the owners of the land where they come to rest.

Chronica der Fresen (1706) by Eggerik Beninga notes litigation in 1509 regarding a floating island with cattle and trees on it aimed at returning the parcel to its original owner.

Marschenbuch: Land und Volksbilder aus den Marschen der Weser und Elbe (1891) by Hermann Allmers recounts that in 1761, water transported a parcel with 80 oak trees 100 meters, and was later drawn back into place with the help of winches and mentions the litigation concerning another parcel that likewise wandered.

In Gillad och antagen pa Riksdagen Ahr 1734 (1808), Rikes Lag Sweriges declares Swedish law on floating islands to be that whoever catches one, owns it.

Kraggenburg en de Vaarweg van Zwolle Naar Zee (2000) by Aaldert Pol and Gerrit van Hezel reports that eight men were fined in 1847 for stealing floating islands to enlarge their fields.



And for America, a case study from Chautauqua, New York.

A one-to-two acre parcel of land having at least 50 trees upon it, broke loose from Mary Stoneman's farm at Ashville Bay after a storm in late 1892, floated some four miles and came to rest against the Burtis Bay property of Charles Gifford. From the Orlean Weekly Democrat, August 30, 1892,

This strange freak of nature has caused the most intense excitement with the people. Great crowds are at Lakewood and other points on the lake, all of whom are discussing the remarkable event.

"Chautauqua's Floating Island. It will be Anchored near Lakewood and Lifted Up as a Summer Garden," Orlean Weekly Democrat, September 2, 1892,

Mr. Sliney of the Kent House, who was ill in bed the day it floated down, says that had he known it, he would have anchored it and placed it between the two docks and built a stone wall around it. He would then had it illuminated with electric and provided rustic seats, and it would have been a model place for tea parties. The island is now below Lakewood against the shore and possibly it will be towed back by Mr. Sliney with a view to carry out the idea that he mentioned.



The route superimposed on a 1916 map

Lakewood Mayor Milford Stevens engaged a small steamer to tow the island to Greenhurst Island -- apparently a shoal then exposed at times of low water -- but the effort was unsuccessful.

Developer Charles Wicks paid Gifford (owner of the new site) \$5 for the property and constructed a fence in an effort to anchor it, and obtained a quit-claim deed.

Meanwhile, Joy Butler, John Prather and Charles Niedhart of the Chautauqua Building and Loan Association paid \$5 to Stoneman (owner of the original site) for her claim and received quit-claim deed. The price was low, it seems, as Niedhart was promptly offered \$300 for his stake.

The Association's efforts to anchor the island proved futile and high water and high winds dislodged it, grounding it against Fred Bentley's farm, where he in turn claimed possession.

Another party, W.L. Sessions, produced a deed originally held by the Holland Land Company for "all lands at the bottom of the lake."

From "Dispute over a Floating island," News and Observer, April 15, 1893,

Meanwhile, other parties applied to the State for a title, claiming that as soon as it became detached from the mainland the island became State property.

From "A Floating Farm. Chautauqua Lake, the Scene of a Queer Legal Contest," Rochester Daily Republican, November 1, 1892,

The legal fraternity began to discuss the case, and some puzzling questions arise. Thus, is the property real or personal? If personal, being movable, was it the property of the original owner after it had been lodged in the highway? If real estate, it is properly an accretion of the land against which it lodged, or, having found anchorage in this public highway, does it revert to the state? It is argued that, being movable, Mr. Wicks' title will not hold, as he has no right to drive piles in the highway to hold it, while another storm might carry it further down and against another man's property, or a passing steamer might hitch and pull it away, thus making it the property of any person along the lake front.

It's the query raised at the start of this section regarding the Sudan and we've a lot of people in the courtroom. All suits seem to have come to an end, however, when the floating island disintegrated soon after its well-reported sojourn..

As for the island's physical basis, the litigants agreed that the contest regarded a chunk of land broken free from one lake-side property and blown to another.

Additional factors were suggested by others, none backed by appreciable evidence, but good for readership.

Was the floating island an encrustation, a geologic theory of the era? From the same article in the Rochester Daily Republican,

The belief begins to prevail that in Chautauqua valley was once a large body of water, over a portion of which a crust of land has been formed, and that the farming lands around it are but a short distance above surface. On Marvia Park [in Jamestown], an undulating motion of the ground is discernible when a horse passes over it, and when the annual fair is held upon it many timid persons refuse to remain because of the distinctness of the strange vibration.

The phenomenon is a remarkable one and is likely to engage the attention of the scientists who assemble annually at Chautauqua. Naturally the owners of farms along the lake will feel some uneasiness when the next big storm comes. To have the lake dotted all over with little island farms would mar its symmetry and yet undoubtedly add to its picturesqueness.

Or was the floating island the "Grass Island" first mentioned in Lake Chautauqua (1875) by Emma Dewhurst?

Here at the head of the outlet, if you will look over on the left side you will see that the water is quite shallow and the rushes are growing above it; this is "Grass Island," and used to be above water, and it is said that it was once inhabited. Such as it is, it is the only island in the lake.

A June 21, 1895 news clipping,

A syndicate with a deed of Grass Island, a spot in the center of the lake midway between Greenhurst, Lakewood and Celoron, made the first move toward filling in the island this week. It is the intention to raise a portion of the two acres staked out and make it suitable for building purposes. From a foot or two feet of water now cover it. When the work is complete, the syndicate will build a summer house on the island, and an effort will be made to make the place as beautiful as it will be a novel.

A sailboat 20 feet long and 200 feet of sail is being used to haul boulders for filling in the island. The work will be pushed while the good weather lasts and the water is low.

It is not expected that the work will be finished this summer. John H. Prather of the Chautauqua Building and Loan Association acting as trustee of the deed is at the head of the movement.

The Buffalo Express wondered "Is Chautauqua Drying Up?" noting that drought that had lowered the lake five feet, exposing many gravel bars and leaving Grass Island "high and dry above the surface."

The alluring possibilities it offers as a site for a summer resort have induced land speculators to stake it out, unfurl an American flag over the center and began fixing a foundation for a building. The work was started several week ago and the present low water has encouraged them to proceed.



As Grass Island was never deeded, unfurling the flag would have been a ploy for ownership. See Chapter 53.

Or was the floating island related Whitney's Crib, a nearby submerged shoal used as the foundation for a fort-like structure at the turn of the century?

Or was the floating island refloated dredging spoil? Report of the Special Lakes Committee of the Board of Supervisors of Chautauqua County (1948), concerning dredging from McCrea Point to the region of Fluvanna, reports that between 1887 and 1891, 180,000 cubic yards sediment and logs were removed from the bottom, placed on barges and dumped in , most in the shallows of Burtis Bay

Or was the floating island the legacy of fairies? Legends of Chautauqua (1895) by Susan Pulver contains a protracted free verse poem about Scandinavian Brownies who cross the Atlantic on shells and starfish and walk inland to Chautauqua shore where they establish an Acadian village. With the cooperation of nature, the Brownies break their village free as a floating island, but in so doing, part a pair of lovers. Brave Oswald and his turtle friend are unable to overtake the island. A minnow's attempt to convey Oswald is likewise unsuccessful. After the island comes to rest at Shadyside, Oswald is able to cross the water on a sunfish all live happily ever after.

Whatever its history, the floating island of Lake Chautauqua is no more and the shoals are marked by buoys.



Accretion and Avulsion

We've dealt to this point with islands that truly float, disengaged from the waterbed.

A much more common occurrence, an island can appear to change location by eroding on one side while extending by deposition on the other, geomorphic processes discussed in Chapter 20. In a legal sense, such change is called an "accretion" if it is natural and of an "imperceptible" nature. The meaning of "imperceptible" specified in the County of St. Clair v. Lovington Supreme Court ruling, 1875:

The test as to what is gradual and imperceptible in the sense of the rule is that though the witnesses may see from time to time that progress has been made, they could not perceive it while the process was going on.

An "avulsion" is caused by the same erosive mechanism, but unlike an accretion, at a rate that is "directly perceptible or measurably visible." An avulsion is an event in which a measurable change occurs over a short period.

We'll continue to use "imperceptible" vs. "perceptible" in deference to legal terminology, but in a geological sense, the distinction is somewhat akin to "gradualism" vs. "catastrophism." In common conversation, the distinction might be "continuous" vs. "event."

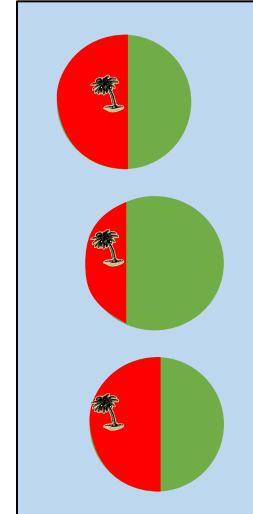
The "Law of Avulsion," is a legal concept by which a landowner gains ownership of land gained by accretion and loses ownership of land lost to erosion. Property lines remain fixed in terms of geodesic coordinates.

Top -- An island belonging to two owners.

Center -- The island has "floated" by imperceptible erosion on the left and imperceptible deposition on the right. The left-side owner now own less property and the right-side owner now owns more.

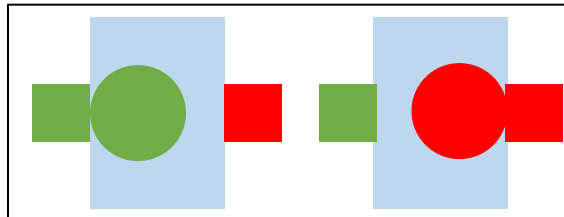
In the case of avulsion, on the other hand, the property lines adjust to mitigate hardship caused by the abrupt change.

Bottom -- The island has "floated" as the result of an incident (or incidents) of land loss on the left and deposition on the right. The property line shifts along with the island so that the left-side owner is no worse off.



The "Law of Accretion," similar in title, but different in concern, relates to waterfront real estate that becomes separated from the water by deposition, albeit imperceptible or perceptible. As a waterfront owner should retain the original adjacency to the water, the deposition becomes the property of the landowner, a windfall acquisition.

To illustrate, a parcel of land from the left bank "floats" to the right bank. Because the owner of the right bank is entitled to his or her original shoreline, the parcel now belongs to him or her.



All the above comes before the court in the history of Arsenal Island, St. Louis, Missouri, but as we will see, with inconsistent legal conclusions.

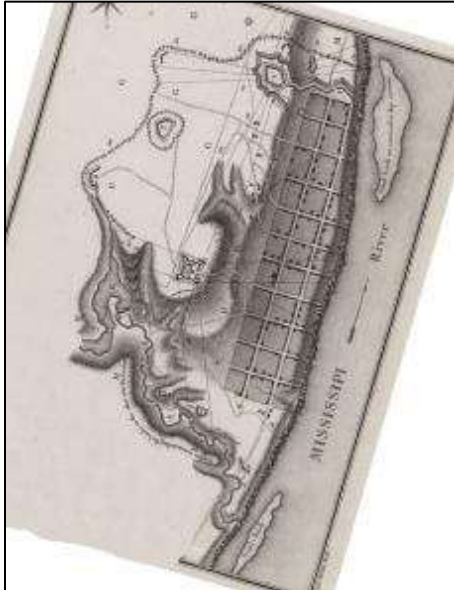
The news media repeatedly called Arsenal a "floating island," though all knew that it was doing nothing more than progressively eroding on its upstream side and depositing on its other.

"City's Lost Islands. Illinois Has Three That Once Belonged to St. Louis," New York Sun May 5, 1907, summarizes the situation.

St. Louis has lost three Islands, though the names are as well remembered now as when the islands themselves were actually in existence. One is Bloody Island, just opposite the city. The old timers used to go there to fight their duels, and in those days the river channel ran on the Illinois side of the island, and except in high water there was only a slough between St. Louis and the dueling around. The government and railroad works put Bloody Island on the Illinois side, and now a good part of East St. Louis is built over the sand bar that was once a thicket of willows.

Arsenal Island, too, used to be on this side of the river, and boys rolled up their trousers and waded across the narrow slough from a point a little south of the workhouse. The boats went on the other side of the island, but the channel began cutting into the Illinois farms at such a rate that the Government threw up a dike just across from the arsenal and turned the river to this side. The island was joined to the Illinois shore, was finally purchased by the State of Illinois from the City of St. Louis and the former bed of the river is now covered by farms.

Duncan's Island was a big sand bar that began near the foot of Lami Street and extended north to Geyer Avenue. It was purchased by the Iron Mountain Railroad Company, which wanted to locate its yards in that neighborhood and filled up the site with earth from Picot's hill in Carondelet. The names still live, for the people of East St. Louis make a difference between the "island" and the mainland, just as the farmers in the bottom still talk about Arsenal Island and the switchmen in the yard south of Chouteau Avenue tell one another that a certain car is down on Duncan's Island.



Above, two maps from the 1790s and an 1844 map. The small island near the top, a "sand bank," would later grow and be known as Bloody Island.: At the lower end, Duncan's Island can be seen to have enlarged between the surveys.

Roughly a kilometer downstream, the St. Louis Arsenal was constructed in the 1830s on a bluff overlooking the river. The head of what would become known as Arsenal Island -- some 1200 meters long by 800 meters at its widest -- was several hundred meters up-river from the post, just below the above mapping.

In the early 1850s, the island was known as "Quarantine Island," by virtue of its use to contain the spread of cholera. While the island was alluvial, the construction of a hospital on it suggests that the site seemed stable. Its efficacy for quarantine, however, seems questionable.

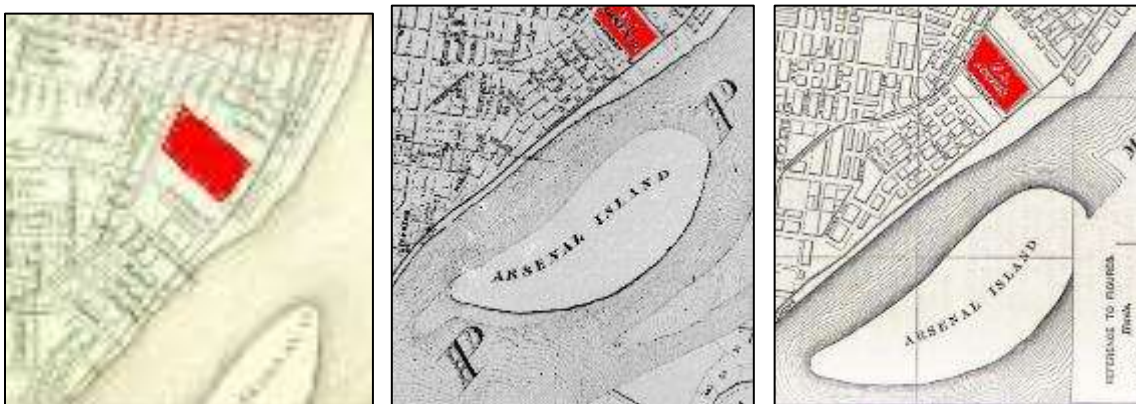
Boys rolled up their trousers and waded across the narrow slough from a point just a little south of the workhouse.

The idea of a floating quarantine wasn't unique to St. Louis, however, as indicated in "Quarantine Floating Island," New York Herald, July 29, 1866.

A resident along the shore of the Lower Bay thinks that a floating island could be constructed for the purpose of receiving patients from infected ships. Hospital tents, he says could be placed on the island, which are infinitely preferable in cases of contagious diseases to the ordinary hospital barracks.

In 1861, the St. Louis hospital was military, but by then, the upper portion of the island was being washed away, retreating as much as 80 meters during spring flooding.

By 1865, the top of the island had moved downstream to a point directly opposite the arsenal itself, today's Lyon Park on Arsenal St. Public works on the island were abandoned and a private resident, Augustus Blumenthal, had to move his house more inland.



Maps of 1867, 1868 and 1885, the arsenal site highlighted.

Note: The 1885 map has relied on earlier surveys, as what is labeled "U.S. Arsenal" had long since relocated and, as we will see, so had the island. We will continue to highlight the site for geographic reference, although subsequent maps rarely identify it as such.

Various determinations have been made as to how fast the island migrated, but there's no dispute that the process was persistent.

1874,	400 meters since 1865	44 meters/year
1880,	1,500 meters since 1862	83 meters/year
1896,	2,500 meters since 1853	58/meters/year

As described in subsequent Supreme Court litigation,

Such washing away of said river bank occurred principally at the spring rises or floods of high water; that during each flood there was usually carried away a strip of land from off said river bank from two hundred and fifty to three hundred feet in width, which loss of land could be seen and perceived in its progress; that as much as a city block would be cut off and washed away in a day or two; that blocks or masses of earth from ten to fifteen feet in width frequently caved off and fell into the river and were carried away at one time.

As noted in the Encyclopedia of the History of Missouri (1901) concerning the remains of those who'd died in quarantine,

The old graves were subsequently washed away and the bones scattered from here to the Gulf.

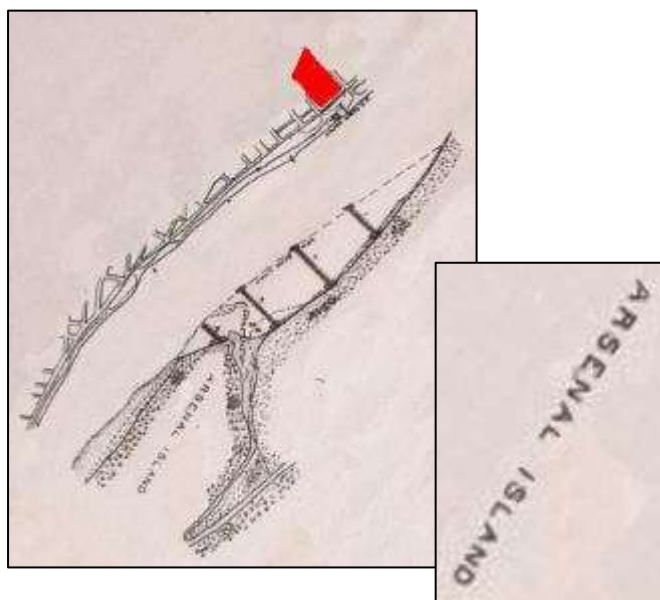
By the mid-1870s, the foundation of Blumenthal's relocated house had been washed away and little remained of the historic island. Realizing the legal jeopardy of abandonment, however, the City engaged Benjamin Seeger to reside on the residual island, now nearer the Illinois bank than that of Missouri.

In 1874, the island fronted a parcel on the Illinois shore owned by the Cahokia Ferry Company. The ferry company claimed the right to extend their boundary across it to the water's edge, entering the island and erecting a fence to that purpose. This fence was torn down as soon as its existence came to the knowledge of St. Louis authorities, and signs were erected prohibiting trespass.

In 1876 the federal government built a stone dike from the Illinois shore to the deposition, and a few years later, a dam above the dike, diverting flow from the Illinois channel, and by 1884, the accretion was effectively dry.

The map shows the works in 1898. Note the name of what's now effectively a parcel of Illinois mainland.

Why the federal government, whose diking enhanced the reclamation, was not brought to task in subsequent lawsuits, we do not know.



"Their Home Is a Moving Island Between Two Cities," St. Louis Republic, November 18, 1900, provides a sense of the news coverage.

There is a family living between the States of Illinois and Missouri whose daily existence may be compared to that of the animal used to turn the treadmill. They must keep moving if they wish to live on the same site that they have selected for their home. The animal in the treadmill move that it may stand erect and remain in one spot, while the family in question are forced to move in order to remain in the exact spot where many years ago their original home was erected. This may sound like a paradox, but it is none the less true.

Officially or otherwise this queer strip of land is known as Arsenal Island, but according to Mr. Guyot, it should be properly called Floating Island.

In the last twenty years the island has moved downstream approximately about two miles. It has maintained its same general conformation; that is, as regards to width and length.



Further within the piece is the meaning of "floating."

The island does not actually move. Its gradually dropping down the river is explained by the fact that the action of the water washes away the northern end and builds up the southern, or. In other words. It is a sort of transference of the land of the island from one locality to another.

The man who owns the northern end of the island, about a hundred acres, long ago lost his possession, for it was quietly carried away by the river, but his neighbors were obliging, and when the southern end of the Island began to appear above water and to grow into definite and inhabitable shape, they consented to move down a sufficient distance to enable the proprietor, of the northern end to attain his same amount of property. During the years that the island has been journeying southward the possession of the various parts of it has passed through the hands of all of those who have an interest in this strange bit of terra firma, and yet each to all appearances has his claim located exactly where it was when first the island was taken possession of.

The conditions described, however, date from some two decades earlier. By 1900, the one-time Missouri island was dry land in Illinois. A story can outlive its reality, we conclude.

In 1884, Edmund Rutz, owner of the Illinois property against which the one-time island now rested, brought suit in Circuit Court to eject Seeger from what Rutz claimed to be his real estate.

"The Emigration of Arsenal Island from Missouri Illinois," St. Louis Globe-Democrat, July 12, 1885, illustrates a public perception. Note use of "float," not once, but twice.

The island written about or spoken of yesterday is no the sane divisional part of the earth's surface that it is today, for the reason that it shifts and floats about constantly. Once it was determined as Arsenal Island was a piece of land separated from the Missouri shore miles above the present island of that name by a slough, with the river channel between the detached piece of land and the Illinois shore. As the middle of the channel is considered the boundary line between Illinois and Missouri, the island was correctly considered to be a part of this state. Gradually, however, as the periodical river surveys in the office of the United States Engineer show, by the action of the river, the abrasion of the north end of the island and the corresponding deposit of alluvium at its south end, the island shifted or floated southward, and owing to the short improvements of this city, the establishment of the permanent wharf-line of St. Louis away out east from the natural shore and the dykes built on the Illinois shore on

behalf of a deep-water channel at all stages of the river on this side, the island was driven downstream and to the east side of the channel of the river.

Editors recognized that "floating island" perks readership, the headline, "A New Case in Court. Who Owns an Island that Floats About in the Mississippi?" Daily Graphic, November 15, 1887, making the point.

Arsenal Island formerly lay west of the main channel of the Mississippi River, just in front of the center of the city of St. Louis, and belonged to that city. It contains about 500 acres. The city gave Seeger a nominal lease to the island and put him in possession to take charge of it. Gradually the island moved away from its original anchorage, slid down the river, crossing the channel in its progress, and halted on the Illinois side just off land in St. Clair County owned by Edmund Rutz. It assumed this position about 1870.

Then, in its work of river improvements, the Government built a dike from the head of the island to the Illinois shore, and by natural deposits the remaining space between the island and the original western line of Rutz's farm has been entirely filled up so that the water's edge is now at Rutz's original western boundary, but at the west side of what was once Arsenal Island.

The defense is that the island has merely impinged upon Rutz's farm, is not a natural accretion, and is entitled to move on again if the Government will take its dike away.

The Circuit Court ruled that the build-up on the Illinois bank was, in essence, new dirt slowly acquired -- natural accretion, in other words -- and should be treated as normal bank extension. If so, it was Rutz's gain.

From "A Floating Island. The City of St. Louis the Plaintiff in a Queer Riparian Case," Ogdensburg Journal, October 6, 1889,

An appeal has been taken from the United States Circuit court here to the supreme court of the United States in the Arsenal Island case. This island formerly lay in the Mississippi river on the Missouri side of the channel, immediately in front of the corporate limits of St. Louis, and belonged to that municipality, being held for school purposes.

In the course of time, under the friction of the river, it disappeared, and simultaneously a body of land accumulated on the river front on the other side of the river on lands in St. Clair County, Ill, belonging to Edward Root [sic. Edmund Rutz], ex-state treasurer, and he claimed those lands as a natural accretion. The city of St Louis also claimed them as the veritable Arsenal Island, which it had lost, alleging that the island had floated away bodily and lodged against Root's farm. The city put on a tenant to hold the lands, and Root brought an action to eject him.

The court here held that the disputed grounds had formed against Root's river front by natural accretion, and therefore belonged to him.

St Louis v. Rutz progressed to the U.S. Supreme Court,

The pragmatism shown in these decisions strongly suggests that the courts will decide each case on its own peculiar facts and equities.

Illinois noted that the particles washed against its shore probably never constituted the defunct Arsenal Island. The island hadn't integrally inch-wormed itself across the channel. As accretion, the extended eastern shoreline land would seem to belong to the Illinois landowner.

St. Louis, on the other hand, framed the process as an avulsive one, aggravated by notable flood events. The City, the victim of natural attack, should retain title, albeit to land that by virtue of having been shoved across the Mississippi, was now in Illinois

The Supreme Court, answering only to itself, is a body that has tended to resolve cases involving sediment in a manner described by Bruce Flushman in Water Boundaries, Demystifying Land Boundaries Adjacent to Tidal or Navigable Waters (2002) as "flexible."

The decision, released in 1891, described the island's movement not as the result of accretion, wording not pleasing to Illinois.

Such washing away of said river bank did not take place slowly and imperceptibly; but, on the contrary, the caving in and washing away of the same was rapid and perceptible in its progress;

The bars which formed below and were joined to the foot of Arsenal Island were not formed by accumulations of soil washed up against its lower end, but by the deposit, in times of flood, of soil and sediment on the bed of the river below the island.

To such a movable island, traveling for more than a mile, and from one state to another, the law of title by accretion can have no application; for its progress is not imperceptible in a legal sense... The bar formed at the foot of the island in the flood of a single year extended down the river for the distance of a quarter of a mile or more.

At the same time, but to the disappointment of St. Louis, the decision avoided reference to "avulsion," presumably to prevent geologic terms from taking on unintended legal connotations. Arsenal Island was, for example, "a moving mass of soil, and not an island," to not impinge on "island law," a branch of jurisprudence having its own framework.

The Court instead turned to property rights. the Law of Accretion.

Among his rights as a riparian owner are access to the navigable part of the river from the front of his land, and the right to make a landing, wharf, or pier for his own use or the use of the public.

The right of accretion in an island in the river cannot be so extended lengthwise as to exclude riparian proprietors above or below such island from access to the river as riparian proprietors.

Illinois won, but not on the basis of how "perceptibly" the island "floated." The case turned on access to the eastern bank, the Court deftly sidestepping the chronology of the fluvial process itself.

Newspapers still needed to be hawked, of course, and a reporter could re-write old copy as breaking headlines. Take "Life on a Floating Farm. Arsenal Island, in the Mississippi, Constantly Changing Positions" New York Press, June 12, 1898, for example.

Many of the islands in the Mississippi River are known to be constantly changing their positions, but the moat restless of them and perhaps the most remarkable island in the world is Arsenal Island, now of Illinois, but sometimes of Missouri. Besides its journeys up and down the river, the island occasionally takes a trip across the deep water channel, consequently shifting from the Missouri to the Illinois shore.

Major Thomas H. Handbury of the Corps of United States Engineers believes that Arsenal Island will eventually become a part of Missouri territory, and says its constant movement is easily explained. The dirt on its upper end washes away under the force of the river current and accretions form at the lower end.

Arsenal Island has also been known as Quarantine Island. Both names indicate the use to which it was put between 1830 and 1867, when a quarantine station and the United States Arsenal were maintained there. But Arsenal Island is the official name and is used in all land grants and deeds that have been made with reference to it.

At this point, the revived storyline turns to a new cast.

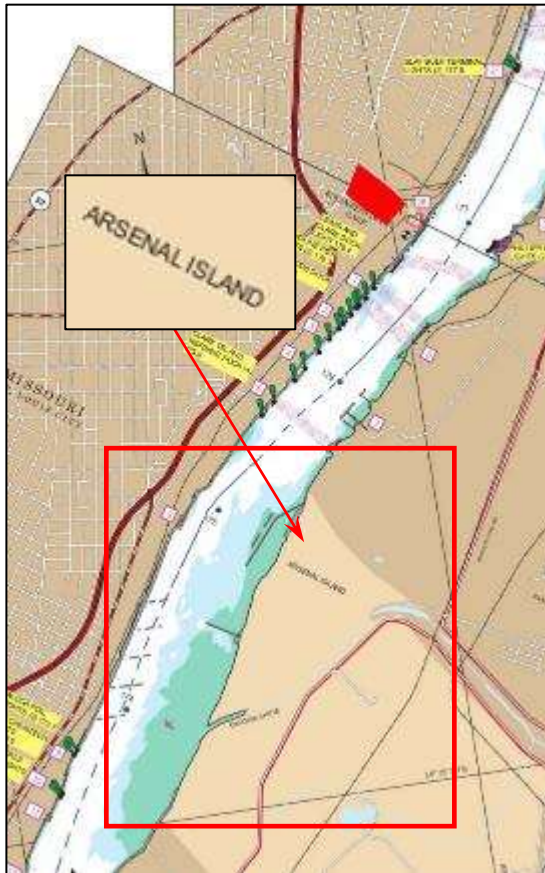
The island is the property of J.S. Pittsfield of Illinois, but is leased by Joseph R Jobin, who lives upon it. His house is in the midst of a pretty grove of willows, elms sycamores and cottonwoods at the upper end of the island. It is a modest little one-story building with five rooms, which are very clean and comfortable. It is surrounded by storage, houses and poultry yards. Stretching away from the grove are many acres of fertile land, which is in an excellent state of cultivation.

It's not only a new cast, but a new stage, this one yet floating some decades after the Arsenal Island had come to rest in Illinois.

The proprietor told a reporter of the St. Louis Post-Dispatch that his hope is to convert the place into a stock ranch. Since he landed there, in 1893, he says that more than fifty acres have been washed from its upper end and fully as many acres been added to its lower end. Since 1853 Arsenal Island moved southward 8,000 feet.



Maps of 1903 and 1912. In reality, Arsenal Island was by then affixed to the east bank.



Left, Army Corps of Engineers navigation chart, 2011

Aerial view with "Arsenal Island" delineated by landform.



Let us depart Arsenal Island with a description from Encyclopedia of the History of Missouri (1901) that's reasonably accurate a century later.

Looking from the arsenal in a southerly direction, the migratory island is seen some distance down the river, snugly reposing near the Illinois shore. At night a light is seen glimmering from the same island that formerly lay abreast of the arsenal.

Now the great river sweeps past with no obstruction to the view, and the entire channel passes the island on the western side, thus sundering its former connection with the Missouri shore by the whole width of the river.

In a similar case, *Houston v. U.S. Gypsum*, 1981, the Houston family owned Stack Island in the Mississippi and U.S. Gypsum owned land on the other bank, along with "any islands located between the above described lands [and] the Louisiana-Mississippi state line." When titles were granted, the family's island was upstream from the reach described in Gypsum's deed. Over time, however, Stack Island eroded at the upstream end and deposited at the downstream, "floating" into the reach included in Gypsum's deed. The Court finessed the geological arguments by holding that Gypsum had waited too long to assert its claim.

Again as observed by Bruce Flushman earlier in this section, the law in such matters seems to be "flexible."

Yankees and Taxes

For those less litigious, we've a story that bounced from one newspaper to another, evoking a decade's worth of chuckles, we imagine, around pot-bellied stoves.

"The Way a Yankee Avoided Paying Taxes," Athens Messenger, December 28, 1882, locates the story on a lake between New Hampshire and Massachusetts.

"Speaking about paying taxes," said a man who had perhaps been performing that pleasant duty, "reminds me of an old fellow, a sort of hermit who lived where I did in a small town in New Hampshire, and if he wasn't the out and-out chap for avoiding the demands of the state, then I'm mistaken."

"Why didn't they sell him out?"

"Because they couldn't get hold of the property. No, it wasn't air castles, and he didn't live in a balloon, but on solid property, and every time the lax collector came around in New Hampshire, Ezra and his property were in Massachusetts."



"Oh, I see. Ezra and his property on wheels, and shoved it about to suit."

"Not exactly, but he had his property fixed, so that he could shift it anywhere he wished. It was nothing more nor less than a floating island made up of bog and stuff, and for a good many years it blew about the pond, until finally the old chap put up a hut on it, kept a cow, chickens and ducks, and had a regular floating farm. But one day he heard the assessor was coming, so he cast off the moorings that he had rigged to the island, and before the next day the wind had carried him over the state line that ran through the pond into Massachusetts, and when the collector went out in a skiff the old bog-skipper, as they called him, actually threatened to have him arrested for trying to collect, the taxes of a neighboring state. He anchored the island on the Massachusetts side until the selectmen got after him there, and for several years he dodged back and forth, and didn't pay a cent on his four acres. But finally they put up a job on him, and two assessors, one from each state, went out in skiffs, the island being anchored in the middle of the lake. The old man said he was ready to pay, but he wanted it just right, as he lived in both states -- the house was in one state and the barn in the other. The collectors got so mixed

up trying to straighten it out that I believe they had to take it into court. Anyway, I don't think the old man's taxes are square yet."

Although the island's not named in the above, it's Lake Monomonac in the version reported in the Helena Daily Independent, December 9, 1882.

"A similar ease might happen at another place in New England," said one of the group of listeners. "On Lake Monomonac there is an island that for a long time was called the mysterious island. It belonged to the town of Winchendon, Mass., contained about six acres, and was covered with trees thirty feet or more high. Some of the people declared they had seen the island move years ago, but, they were generally laughed at, until one morning they found it gone, and now it is, or was a short time ago, over the state line in New Hampshire, nearly three miles from where it at first stood. It was originally bog held together by roots, and the water had gradually undermined it, until a good, sharp breeze took the trees as sails, and away went the island.

"Well. I declare," said the first speaker, "then old Ezra's floating farm wasn't such a very singular thing after all."

We've other accounts of the bi-satae island, as well, but sans tax collector, "A Floating Island," Spirit of the Times, July 11, 1874, being one.

The wonder at Winchendon, Mass., just now is a floating island of about five acres, which is voyaging around Lake Monomonac, a sheet of water of about 2,500 acres in extent, lying partly in Winchendon and partly in Rindge, N.H. It formerly claimed a residence in Winchendon, but toward the latter part of May, the little island was, one morning discovered to have changed its place and moved about two miles up the lake beyond the state line, then it floated back nearly to its old place, a day or two after, to sail north again.

Its soil is firm and many people have approached it by boats and traveled over it; the entire surface is covered by a thrifty growth of vegetation, consisting of grass, cranberry vines, bay and whortleberry bushes; there are more than 400 trees by count, varying from five to twenty-five feet in height, scattered over its surface. Strong southerly winds probably assisted the island in its wanderings, and the unusually high water in the lake perhaps parted it from its ancient moorings.

Another, "A Most Wonderful Natural Curiosity," Fitchburg Sentinel, June 23, 1874,

A most wonderful natural curiosity in the form of a floating island has recently made its appearance upon the northern part of Monomonac Lake in Rindge, N.H. In extent it is variously estimated from four to six acres. The soil is firm and many people have approached it by boats and traveled over it. The entire surface is covered by a thrifty growth of vegetation, consisting of grass, cranberry vines, bay and whortleberry bushes; there are more than four hundred trees by count, varying from five to twenty-five feet in height, scattered over its surface

The island was first seen in this part of the lake on Saturday, May 30. Perhaps not liking the harbor, during Sunday night it weighed anchor and majestically moved about two miles down the lake. Wednesday, June 8, it returned to the same place and took a similar position, except a quarter turn, where it has since remained.

This tract of land was originally a part of Winchendon, Mass., and was probably started from its natural location by the lake being unusually high and a strong southerly wind prevailing. It has been suggested that the island left Massachusetts for a summer vacation in New Hampshire and to escape the effects of protracted legislation.

"Has Tax Collectors Guessing: Old Hermit Who Lives on Floating Island Sails His Property from One State to the Other," Washington Post, August 9, 1914, uses New Hampshire and Vermont.

On the line of two of the New England States there is a small lake or pond that several years ago, as the story goes, was brought into public notice in a somewhat curious way. The borders of the lake on one side were formed of a thick bog, and in some way a portion of three or four hundred feet in length had become separated from the shore, and being formed of vegetable matter and extremely light, it had floated or drifted away -- a veritable floating island.



The top of this strange bit of New England was about four feet out of water, and covered with a thin crop of grass and a number of trees, the latter forming a sail, so that when the wind was from the west the island slowly sailed away until it stranded on the New Hampshire shore, we will say; and when an easterly gale came up, away it went again, crossing the state line and arriving in Vermont.

So it belonged to either State, according to the direction of the wind, and often cows, chickens, horses and stock of various kinds, tempted upon the treacherous island by the green grass, were transported across the border much to their astonishment and the an annoyance of their owners

Finally, an old hermit who lived in the vicinity bought the island from its alleged owner and built a small house upon it, and for some time lived in peace and happiness. But one day the tax collector came around, and as it happened, the old man was out, but hearing that he was coming again the next day, he cast off the moorings of his island craft, and towed it out into the pond, just over the State line into Vermont, and when the tax man came he claimed to be a "Vermonteer."

Sometime after the Vermont tax collector appeared, but the old hermit had heard of the expected visit, and when the official appeared the island was in the State of New Hampshire.

For some time this went on, until finally the two tax collectors, it is said, joined forces and advanced on the inland from both sides.

They found it anchored on the State line by a long rope, and as the wind was blowing down the lake, it was swaying about, now in Vermont, now in New Hampshire, so that by the time one collector established his claim, it was evident that it was not legal, and they became involved in such a war of words that at last accounts the hermit had not paid his taxes, though he expressed himself as willing to do so when the collectors could decide where he lived. As far as he was concerned, he "claimed neither state."

Minnesotans and Permits

There could be many permits required, but we'll conclude our courthouse visit by seeing about moving a floating island in Minnesota. Because of their value to a lacustrine ecosystem, aquatic plants growing in public waters are considered to be state property. A permit is required

To remove from or transplant into public waters any aquatic plants or a bog of any size whether free-floating or lodged in an area other than its original location... "Bog" means an aquatic mat, either attached to or resting on the bottom or floating, that is normally made up of dead organic matter held together by various types of living plants. "Public waters" means any body of water 2.5 acres or larger within an incorporated city limit, or 10 acres or larger in rural areas.

When a floating bog has broken free from the shoreline by natural causes and becomes grounded elsewhere, the property owner where the bog has grounded may remove the bog if so desired.

In 1998-2000, 19 northeastern Minnesota permits were issued for the removal of floating bogs ranging in size from 5 square feet to 5 acres. In the same period, in central Minnesota where the greatest number of such permits permit is issued, many of the 178 issued were for moving or removing "migrating" floating bogs.

Developers of Duluth platted the adjacent township of Fremont in 1856 atop the bog of driftwood, matted tamarack roots, moss and brush between Rice's Point and Minnesota Point in Lake Superior. One island in the mire was named "Meander Island" because it was always on the move.

"Land Moving Away," Youth Companion, January 2, 1879,

"Real estate" is commonly supposed to be the kind of property that doesn't move; but now we hear that several "city lots" have actually swam away from their owners at Duluth (Minn.), on Lake Superior. A correspondent at that place writes as follows to the Cincinnati Star:

The large floating island near the Northern Pacific docks, which for years has defied the to move it materially, was driven across the bay recently and now reposes in the neighborhood of the others, a short distance below Mr. Hughes' mill. It was dislodged, not so much by the at the wind -- as a very moderate one was blowing at the time -- as by the almost unparalleled high stage of water that for the past few weeks has prevailed at the head of the lake, and consequently in the bay. It was lifted out of its place, as it were, and then the action of the current and a very moderate wind sufficed to drive it across the bay.

Incredible as it may seem to those who have never seen the floating islands, this last one embraces somewhere near two acres; it is covered with a heavy growth of tamarack, cedar, etc., some of the trees being eight or ten inches in diameter, and from twenty-five to thirty feet in height, and as will be seen by consulting one of the city maps, it was laid out into city lots.

Query -- To whom do the lots on that island now belong? The same one that owned them heretofore, or the man on Minnesota Point, who owns the lots to which they are now joined and attached?

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Dwight Woodbridge and John Pardee's History of Duluth and St. Louis County, Past and Present (1910) contains the reminiscences of George Smith, a young man at the time of Freemont's promotion.

Mr. Cook would not listen to any objections, but insisted that he must get on one of the islands, regardless of the consequences.

Finding him bent on his project, I rowed alongside one of the larger islands, took a pair of the oars and laid them parallel to each other about two feet apart on the soft muck and roots, then laid a second pair of oars at right angles, and placed the rudder of the boat on top of the oars, thus making a temporary standing place, to which I assisted Mr. Cooke. When the latter was firmly on his feet he removed his silk hat and made me a speech, which I look back upon as one of the most eventful speeches of my life. Then Mr. Cooke came off his island kingdom, re-entered the boat, and we resumed the journey to Duluth.

From "Jay Cooke, After the Civil War," Century Illustrated 73, 1907,

In the bay were floating islands, which had sloughed off the shore, to be blown hither and thither by the wind. Mr. Cooke, to his amazement, was landed upon one of these, about five acres in extent, and as he walked among the shrub firs, his feet sank several inches in the soft mold.

The "boom time" reminiscences of Fred Smith in History of Duluth,

Probably one-half, at least, of the surface of the bay was covered with what appeared at the time to be permanent islands; some of many acres in extent and thickly grown up with small spruce, jack pine and balsam. These islands were for years favorite fishing places, and on lazy afternoons we used to get a flat-bottomed skiff, row out and anchor in the lee of one of them.

After the canal was cut, a strong current was developed back and forth in the waters of the bay, caused by the ebb and flow of the lake tide surging through the artificial entrance, and the islands began to cast off their anchorage and drift out through the canal into the lake, there to be broken up and disappear.

It was then no uncommon sight to see what was apparently a solid section of public domain covered with a rank growth of trees and vegetation, slowly and majestically shape its course with fair wind toward the canal, drift out with the race of waters, sometimes off down the lake, to vanish under the horizon or occasionally come back with the winds and pound to pieces on the beach point. During boom times many of these islands were platted and sold as city lots.

Freemont's hopes weren't to last, however. A ship canal cut through Minnesota Point in 1870 created currents which dislodged the township piece-by-piece. From "Note Regarding a Floating Island in St. Louis Bay," Duluth Minnesotan, October 14 of the following year,

Another piece of one of the floating islands passed through the Ship Canal on Saturday night. On Sunday it was broken into bits by the waves of the Lake and is now deposited along Minnesota Point.

When in the spring of 1873, a storm swelled the St. Louis River, no less than a 1,200 x 400-foot portion Fremont floated through the ship canal into Lake Superior. Four men gave chase in a rowboat.



Fremont Island on Lake Superior after being carried through the ship canal.

Daily Alta California, July 4, 1875

The floating island, says the Duluth Herald, which has been down the lake some ten miles, has sailed back again, and strange to say, is likely, from present indications, to re-enter the bay by the way of the ship canal. With its flags flying and the trees on it waving to and fro, it is a sight rarely to be seen.



1870s



1896



Today

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1865. Floating islands in green



Today

Nothing remains of the floating bog and the building sites today.

Ask the Relator®

- If the island will submerge before the judge sorts out the suits.
- If the court will apply the Law of Avulsion, the Law of Accretion, or look elsewhere.
- Where to pay the taxes.
- About permits.

CHAPTER 56

CROSS OVER THE BRIDGE

A bridge, in itself, is not an island. The particular bridges of which we are to speak, however, were at one time -- in their assembly, to be precise -- freely-floating islands of wood, steel or reinforced concrete. To keep our pursuit to manageable length, we'll focus on bridges within the United States in which buoyancy alone supports a span. We will, however, add a work in England and a European possibility (or impossibility, depending on one's disregard for engineering).

Lake Champlain

In the thunderous 19th-century westward expansion of American railways, Lake Champlain posed a formidable obstacle. Floating bridges provided the remedy.

The final link in the railroad route between southern New England and the Great Lakes was completed in 1851, with the mile-long bridging of the lake outlet from Windmill Point, Vermont, to Rouses Point, New York.

The bridge included a then-unique 300-foot end-hinged floating "drawboat," 30 feet wide, 7 feet high, drawing 2 feet of water, fitted with a boiler, steam winch and chain allowing the unit to be swung out at a right angle for the passage of ships.

Vergennes Vermonter, March 26, 1851

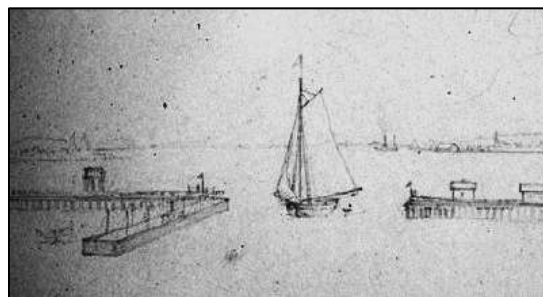
The lake will be piled from its shores to the edges of the navigable channel; upon these piles a railroad track will be laid. In the gap and across the channel a huge float, operated by steam, is to be placed, which is to be three hundred feet long. This float will have a railroad track, and will swing like a gate on a hinge.



One-third of the bridge's total structure's cost went into the floating section and its equipment.

The Rouses Point drawboat proved to be troublesome and was only in service for 17 years, replaced by a center-pivot swing-bridge. Although the upgrade cost more and provided a narrower opening (90 feet per side), it was less subject to ice, lake level fluctuations and wind. The center-pivot was used until the crossing was abandoned in the 1950s.

Rouses Point, 1857



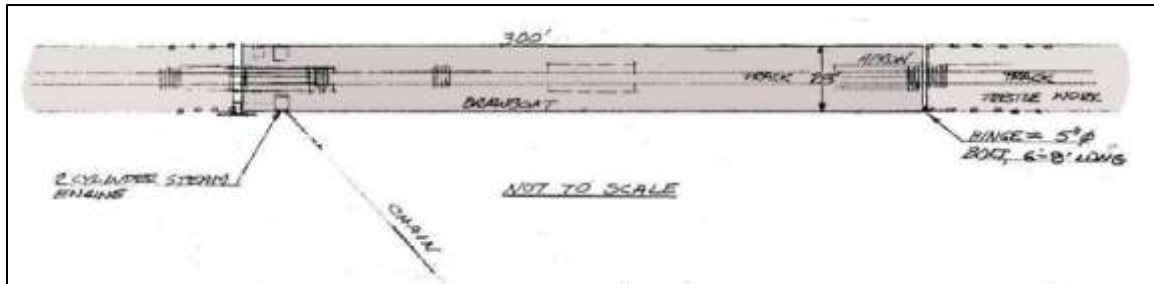
A southern crossing of Lake Champlain was completed in 1871, a 1830-foot open pile trestle across the lake's inlet between Ticonderoga, New York, and Larrabees Point, Vermont, with a 300-foot pontoon drawboat patterned after the one at Rouses Point. The principal difference between the two bridges was that the Rouses Point drawboat recessed 50 feet into the trestles,

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leaving a clear opening of 250 feet, while the Ticonderoga design allowed 270 feet because when the drawboat was swung open perpendicular to the trestle, 30 feet of the opening was blocked by the width of the boat itself.

When the first drawboat succumbed to age in 1888, it was replaced by a new drawboat, 300 feet long, 30 feet wide and 12 feet high, bottomed with well-calked yellow pine from Florida. In 1902, this second drawboat caught fire, burned to the water's edge, and sank.

A replacement drawboat was fabricated immediately, this one 4 feet narrower and 2 feet higher, and with shorter aprons. Note the specification of the hinge pin: 5-inch diameter, 6 feet, 8 inches in length.



A mishap in 1918 revealed the 26 x 14 foot cross-section to be inadequate in terms of torsional resistance. As reported in the Vergennes Enterprise and Vermonter, March 28 of that year, the structure twisted.



Traffic over the Addison branch of the Rutland railroad, running from Leicester Junction to Ticonderoga, has been tied up for a week, caused by the sinking of the drawbridge over Lake Champlain. The drawbridge sank last week Wednesday night as the evening train was going over, letting two freight cars into the lake.

The engineer, noticing the boat was tipping, uncoupled the engine and barely got off when the boat went over. The deck of the drawbridge is now on a level with the lake ice but the draw does not rest on the bottom of the lake.

The cause of the trouble is supposed to be a leak that let water into the float. There were two cars, one loaded with paper and the other with wood, on the bridge at the time and both were overturned by the tilting of the float as the incoming water rushed from one side to the other.

The bridge was repaired, but trains usually pushed the cars across and let another engine pick them up on the other side. In 1921 the bridge was abandoned.

Mississippi River between Marquette, Iowa and Prairie du Chein, Wisconsin

The 8,000-foot crossing, completed in 1874, consisted of two bridges crossing channels on the Wisconsin and Iowa sides of the river separated by islands.

The wooden pontoons were 408 feet long, 28 feet wide and 5 feet deep, drawing 10 inches of water, which depth was increased to 18 inches when loaded with cars. As the range from low to high water is 22 feet, the track was blocked up between stiffening trusses on the deck,

The pontoon was winched by a 20-horsepower steam engine, and could be opened with the current in one minute, and closed again against the current in three minutes. When open, the channel width of 380 feet.

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Chapter 56 -- Cross Over the Bridge

A patent for "Floating draw bridges", filed by John Lawler, was granted in the same year, discussion of it in the Transactions of the American Society of Civil Engineers, 1884. Lawler's patent was later employed by the Panama Railroad.

Repairs were made in 1882 and 1888, and a new pontoon was placed in the east channel in 1898; another five years later in the west channel, the new floats 30 feet wide on the bottom and 41 feet at top, divided by three longitudinal walls into four compartments. The bridge opened on an average about five times per day, and was in service about 250 days of each year. Upgraded pontoons were installed for the east channel in 1914, and for the west channel in 1916. Pontoons built of creosoted timber, lasted 12 to 15 years.

The east channel span was taken out of service for repairs in the winter of 1922, replaced with a temporary pile-trestle "winter bridge." Similar repairs were made to the west channel pontoon when the navigation season closed in 1932. The operational goal was to bridge the gap in about 12 hours, a monumental job.

Pontoon closed



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Chapter 56 -- Cross Over the Bridge

Pontoon open



Below, Floating island of the Chapter 27 variety passing through floating island of this chapter's variety.



"Floating Swing Spans for Railroad Bridges" Railroad Engineering and Maintenance, 1932, notes the limitations of pontoons:

It imposes restrictions on the speed of trains and its movement in opening and closing the waterway is somewhat slower than that of movable bridge spans but where these disadvantages impose no serious restriction on rail and water traffic their lower cost has warranted their continued use on the two branch lines of the Milwaukee.

Until 1960, daily passenger service still used the Prairie du Chein-Marquette pontoons, 17 employees working in three shifts needed for operation.. Electricity had been used for the last six years to open and close the bridge, but steam power still raised and lowered the tracks.

The pontoon bridge was disassembled in 1961.

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Mississippi River at Reeds Landing, between Wabasha, Minnesota, and Trevino, Wisconsin



The 396-foot pontoon span was constructed in 1882 and replaced in 1891. In 1907 it was again rebuilt, 40 feet wide. In 1931 the pontoon was rebuilt with creosoted timbers, this time 50 feet wide. Its height was 7-1/2 feet at the ends, while a foot less through the central 320 feet to augment buoyancy at the ends. The pontoon pivoted on a 10-inch, concrete-filled steel pipe and was floated out of the way with a chain drawn by a steam engine.

1916



The floating span had approach aprons sufficient to accommodate the 15-foot variation in river level, but as a train sagged the pontoon 14 inches at mid-span, the tracks were hinged to prevent derailings. According to one observer, "It is a queer sight to one standing on the barge to see the train sliding down the hill on one side and climbing up a hill on the other."

Though the pontoon was protected by "ice breakers," pointed timbers jutting out from the sides, the 1936 ice broke the pontoon loose. A 1951 ice jam severed the chain and the pontoon could not be closed. Repairs were in progress when the approach washed out and the pontoon departed for a more hospitable climate. The bridge was abandoned.

Missouri River



St. Charles, Missouri. 1,560 feet, constructed in 1890; destroyed by ice



Chamberlain, South Dakota. 366 feet, constructed in 1905, developed leaks in 1918, and replaced by girders.

The bridge at Nebraska City, Nebraska, completed in 1888, had a length of 1074 feet over navigable water, with 1050 feet of causeway on cribs over a back channel. The moving portion, 528 feet long, 24-1/2 feet wide, was a triangle in two leaves with its apex downstream. To open it, the connection at the center was loosened and the current swung the halves apart, the services of only one man being needed. The bridge was constructed in just 28 days,



Illinois River at Lacon, Illinois

Built in 1889, the pontoon was 200 feet long, 24 feet wide and 6 feet deep. The river was 38 feet deep at low water and had a maximum rise of 18 feet. Forty feet of the deck on each approach was movable to connect with the pontoon at varying elevation. The pontoon was replaced in 1905 by another of the similar design, but 50 feet longer, operated by two men.



Above, the gate closed and open in 1937, two years before the bridge was replaced with a continuous truss.

Hawaii

The Admiral Clarey Bridge, completed in 1998, connects Oahu to Ford Island in Pearl Harbor. Its 63-celled reinforced concrete pontoon, 930 by 50 by 17-feet, was constructed in three sections in Tacoma, Washington. Able to pass aircraft carriers, it is the largest floating bridge span in the world.



Washington

The state of Washington boasts four of the longest floating bridges in the world, all strings of prefabricated post-tensioned concrete pontoons of grandiose proportions. Three of the bridges cross Lake Washington, Seattle's eastern boundary, a glacially-carved waterbody almost 20 miles long and a several in width, with no significant currents or ice floes. Its average depth of about 140 feet, however, would pose significant challenge to bridge footing.

Chapter 56 -- Cross Over the Bridge

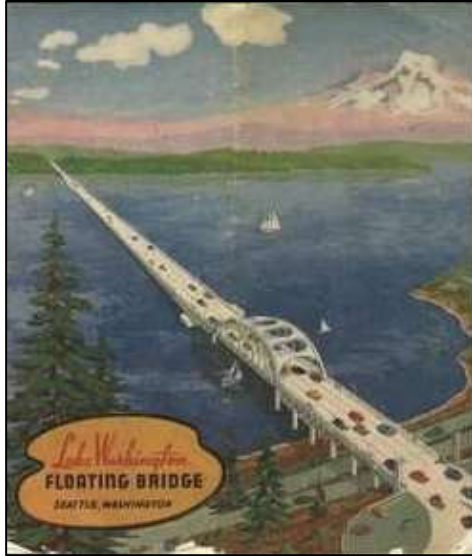
Bridge	Highway	Crossing	Lanes	Constructed	Length
Lacy V. Murrow	I-90 Eastbound	Lake Washington	3	1940, rebuilt in 1993	6,543 feet
Evergreen Point	SR 520	Lake Washington	4 6	1963 Current reconstruction	7,580 feet
Homer M. Hadley	I-90 Westbound	Lake Washington	5	1989	6,130 feet
Hood Canal	SR 104	Hood Canal	2	1961	6,571 feet

As bridge length tends to be reported by differing criteria, we'll not dispute adjustment to the right-most column, but the overall picture is one of very long floating structures. As vehicles cross these structures at freeway speeds, there can be no roadway discontinuities between bridge segments. We'll provide a bit of detail about each.

Looking east from Seattle, the Homer M. Hadley and Lacey V. Murrow bridges, left and right, respectively.

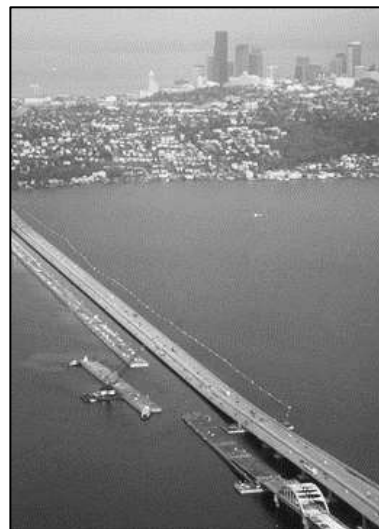
The original Lacy V. Murrow Bridge consisted of 19 pontoons, each 359 feet long, 59 feet wide and approximately 15 feet deep.





A bulge in the original Lacey V. Murrow Bridge allowed vehicles to bypass the drawspan, but the feature became dangerous as traffic increased and the drawspan was removed in 1981.

When the bridge was being refurbished in 1990, prior to widening by means of cantilevered additions, hydrodemolition (high-pressure water) was used to remove the sidewalks. To prevent water from the operation from flowing into the lake, it was stored temporarily within the pontoons. The watertight doors for the pontoons were removed for this purpose. A storm on November 22-24, 1990, flooded some of the pontoons and a pontoon sank, pulling a 2800 feet of the bridge with it.



Emergency stabilization. It took three years to return Lacey V. Murrow Bridge to use.

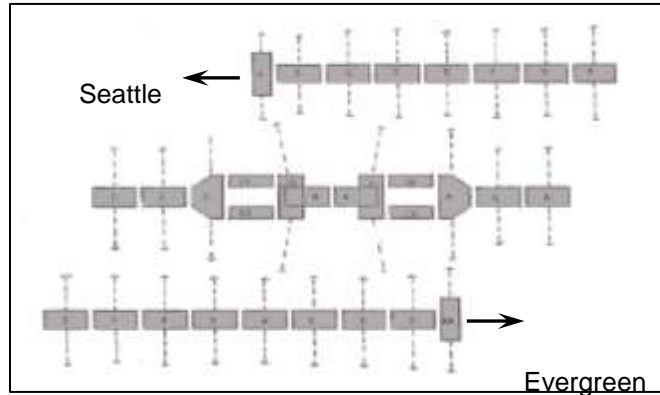
Evergreen Point Bridge, a.k.a. Governor Albert D. Rosellini Bridge of the State Route 520 Bridge, was Lake Washington's second floating crossing.

The structure is the longest floating bridge in the world. Thirty-three pontoons are anchored to 62 anchors, 214 feet below, by 2-3/16 to 2-3/4-inch cables. Interior cell walls are 6 inches thick, while the exterior pontoon walls are 9 inches.

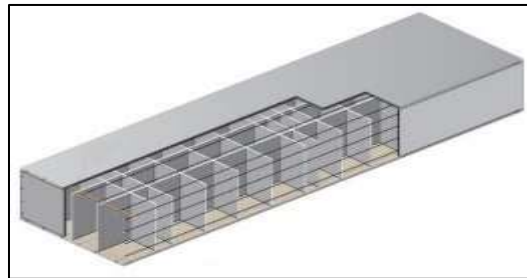


Eighteen of the pontoons are 360 feet long, 60 feet wide and 16 feet tall. The remainder, of varying sizes, include four fender pontoons to buffer pontoons that hold the lift spans and machinery.

Raising two drawspans near the midpoint allows two 164-foot pontoons to retract, providing a 200-foot opening for ship passage.

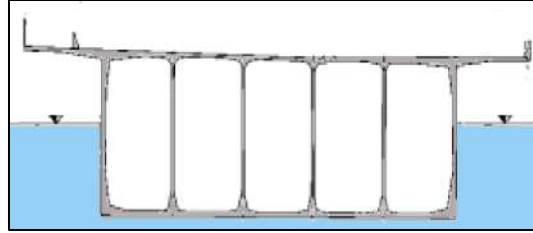


By 1997, the bridge had fallen into such disrepair that it had to be closed during high winds and was floating a foot lower than it had when constructed. Construction of a new bridge, 7,710 feet long, began in 2012. The new bridge will employ 77 pontoons, each 360 feet long, 75 feet wide and 28 feet tall, of which 6 feet will be above water, tethered by 3-inch cables to 58 concrete anchors laterally offset 700 feet.



Passage through the locks between Puget Sound and Lake Washington, 1939 and 2012

Lake Washington's Homer M. Hadley Memorial Bridge rests on 8 pontoons 75 feet wide and 25 to 36 feet in depth. Six are 350 feet long, and the other two, 2190 feet. Each pontoon is divided by internal walls into cells 29 feet long and 14 feet wide. Cantilevered wings provide a 105-foot roadway.



Homer M. Hadley Bridge in construction



In 2023, the Homer M. Hadley Bridge will become the world's first floating bridge to carry passenger trains.

Unlike the floating bridges of Lake Washington, where the water level varies only slightly, the Hood Canal Bridge must rise and fall as much as 16 feet with tidal action

The Hood Canal Bridge drawspans are mechanically movable pontoons located between the bridge's control towers. To open, hydraulic cylinders raise the roadway sections 6 feet, allowing the drawspan pontoons to retract beneath them.



USS Ohio returning to her homeport in Bangor, Washington

In February 1979, sustained winds reaching 85 miles/hour and gusts estimated at 120 miles/hour tore loose and sunk the western drawspan, despite it being opened to relieve lateral pressure. Repairs took three years and much of the crossing has been since upgraded.



Brookfield, Vermont

And lest we leave the impression that floating bridges represent state-of-the-art engineering, the Brookfield Floating Bridge, first built in 1820, is 318 feet long and 20 feet wide, and until recently

has been supported by approximately 400 55-gallon barrels. Under the weight of a car or truck, the bridge would dip and water would upwell in the tracks.

The most recent version of the bridge was built in 1936 and reconstructed in 1978.



As 55-gallon drums are used for a variety of floatation structures -- home-made ones, usually, but here we have a public bridge -- such a drum might be thought of as a type of buoyancy unit, roughly 460 pounds. For a bridge of negligible rigidity, virtually all the support for a vehicle must come from the floatation devices directly beneath it.

The weight a Honda Accord with four passengers is roughly 4,000 pounds; its length, 16 feet. If the bridge weighs 420 pounds/lineal foot, 6,700 pounds of bridge are under our 16-foot vehicle. The total loading, 10,700 pounds, requires a bit more than 23 drums of compensating uplift, and that's with no factor of safety. Given the drum count and bridge length, there would be about 20 drums under the vehicle, not the necessary 23. We needn't be bridge engineers to envision the consequence.

Conditions were worse than that, even; the photos show the center portion of the bridge flooded with zero live load, suggesting that drums had leaked. Not surprisingly, the bridge was closed to traffic in 2008 and removed in 2014. Construction is underway for what will be the floating crossing's eighth reincarnation.

England

"Monster Pontoon at New Holland," English Civil Engineer and Architect's Journal, February 1850,

Another great step has been taken to bridge across the Humber. A floating island, half an acre in extent, has been launched into the sea. This island is formed wholly of iron plates, in the form of a rectangular pontoon, and floats at the end of the pier of the Manchester, Sheffield, and Lincolnshire Railway station, opposite Hull. The pontoon is connected with the pier by means of two tubular platforms or bridges, which always afford an easy descent.

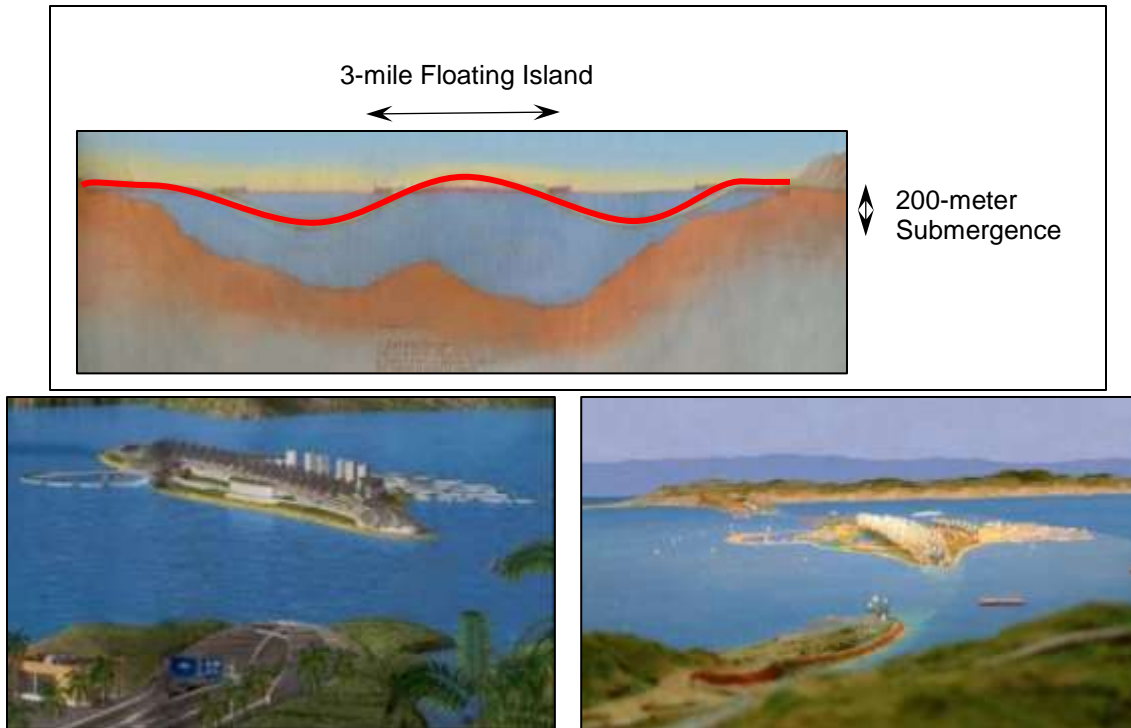
The great mass was launched on the 4th ult., with perfect success -- and ongoing into the water floated at the exact line marked out for it, thus proving the accuracy of the previous calculations of the engineer.

Afro Tunnel, Spain to Morocco

Architect Eugene Tsui proposes a 9-mile floating and submerged bridge between Tarifa, Spain and Point Cires, Morocco. "Afro Tunnel" would include 24 lanes for automobiles, 6 lanes for trains and 5 lanes for bicycles, pedestrians and animals.

The bridge would extend one mile from the coast line and then gradually slope under the Mediterranean for 2 miles at a maximum depth of 200 meters. The bridge would then slope upward to a central floating island 3 miles in length, and from there, again descend and re-emerge a mile from the neighboring continent.

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The structure of the bridge consists of fish-shaped sections resembling the vertebrae of a spinal column attached and locked, in overlapping fashion, to one another by cables. The sections would be prefabricated on land and floated to position. When the string of sections are aligned, the cables are tightened and the entire bridge is locked into place.

From Tsui Design's website, a few ideas about the floating island.

At the three mile wide center of the bridge is a floating island which contains 150 windmills, the world's largest enclosed convention and exhibition area 2 kilometers long (a little over a mile long), 140 meters high, 250 meters wide with 23 floors at 20 meter ceiling height with 500,000 meters squared on each floor and 1 million square meters of total parking space. The island is a veritable city flanked by 120 meter high light houses, outdoor performance plazas, theatres, giant outdoor bazaars and food markets, rolling hills of grass, flowers, trees, parks, water lagoons, bays, 50 meter high waterfalls and fountains, drinking and feeding troughs for animals, bathrooms, giant tented markets and kiosks, two large marinas for boats and tourist ships, photovoltaic solar electricity farms, constructed wetlands for raw sewage and grey water and ecological desalination plants.

Chapter 70 discusses the aggrandizement of attributes. When the practical how-to is scant, complete the picture with imaginative detail.

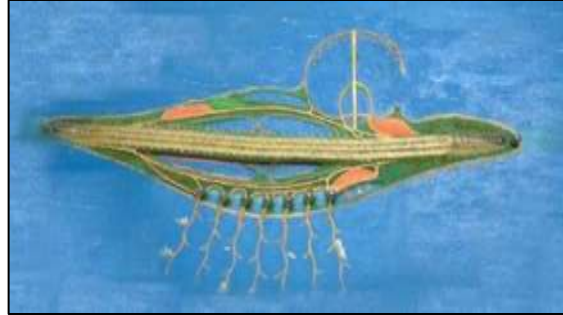
The island portion of the bridge floats on a series of hexagonally braced floating pontoons 60 meters wide. The specially design lattice system allows the island to absorb wave and wind action. It is flexible to diffuse stresses pushing upon it. A triple cable system is employed in case a single cable breaks which would be highly improbable. So far, no cable bridges have ever broken. There will be a period of tightening and adjusting and then the bridge will be in place forever.

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As to why "pontoons 60-meters wide" would float the island -- the center pier of the bridge, so to speak, and the world's largest convention center -- Tsui isn't fazed,

I have formed a partnership with nature and discovered nature's power to design and problem solve far surpasses all the computers on earth.

A closer view of the floating island



CHAPTER 57 LAND AN AIRPLANE

Floating islands and air transport have a long mutual history, at least in the conceptual sense.

We'll begin with a photo a very-real floating island berthed on a floating island, a Zeppelin in her floating dock on Lake Constance, pre-World War I.

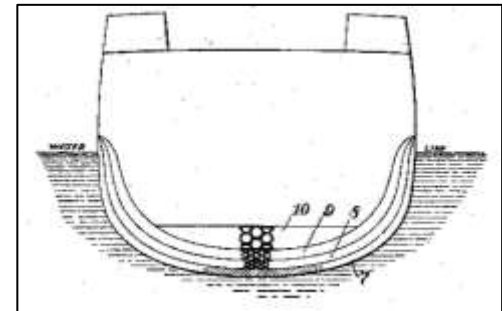


It's the conceptual schemes, however, that carry on.

Plans a horseshoe-shaped "Ile Flotante" were exhibited in 1920 by French architect Henri Defrasse in which seaplanes would take off from a calm harbor encircled by a floating island. Rather than being anchored, island would have diesel propulsion to swing about as the winds required. The Italian government was said to have appropriated \$6,000,000 for experiments, but if so, nothing was reported of the tests.



In 1922, inventor A.C. Heaphy patented a plan for rigid, watertight cells of cement, concrete or other plastic materials as technology for floating airports. While the principal is the basis of many modern floating structures, Archimedes (Chapter 19), not Heaphy, would be due any royalties.



To the right, a cross-section from Heaphy's "Cellular Plastic Construction and Method of Producing Same," Patent 1,438,238.

According to "Floating Islands for Transocean Air Routes," Science News-Letter 12:328, July 23, 1927,

A.C. Heaphy of New York, began on his plan in 1918 and claims the basic patents on cellular plastic construction to be used in building floating airports. The product is virtually floating rock, a formation consisting of a combination of rigid and watertight cells with cement, concrete or other plastic materials, in such a manner as to render the resultant mass, irrespective of its form, buoyant in water or other liquids.

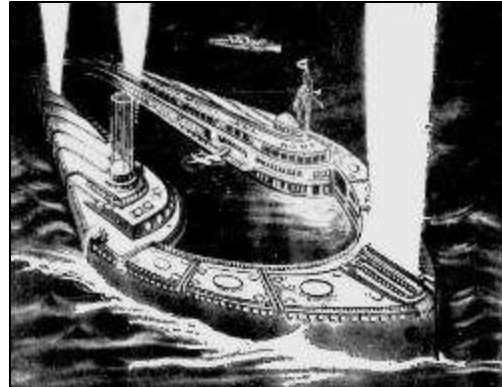
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Chapter 57 -- Land an Airplane

In 1926, L. Blin Desbleds submitted to the Imperial Conference a plan to link up the British Empire by air with a series of "floating island" airports. His design called for reinforced concrete horseshoe-shaped barges, 1400 by 765 feet, protecting a 985 by 295-foot harbor.

From "Man-Made Isles as Call Ports in Mid-Atlantic Scheme for Great Britain. Air Route Laid Before Conference. True Harbors in Stormy Seas," Ottawa Journal, November 27, 1926,

Mr. Desbleds' plan would enable British aircraft to keep in touch all the time with British territory, instead of having to depend on foreign countries to provide links in the flying route between Imperial ports. The floating islands would be the links in a genuine "All-Red" air route through the Empire.



According to Desbleds,

Three lighthouses, placed at water level and projecting: vertical beams of light, would enable the locating of the island at night.

The floating island air station would also offer the advantage of being able to change its place according to the requirement of the moment. It could be defended by aircraft, anti-aircraft batteries and tornadoes, and by such other men as our military, naval, and air authorities may desire.

As reported in "Floating Islands for Transocean Air Routes," Science News-Letter 12:328, July 23, 1927,

The British idea of a mid-ocean landing place, according to plans before the air communications committee, is an island a quarter-mile wide and a half-mile long, with a 985-foot harbor cut in the understructure... It is planned to be built of reinforced concrete, capable of resisting the action of the water. Caissons, water ballasts and giant gyroscopes will insure equilibrium and flotation.

An engineer for du Pont de Nemours & Company, Edward Armstrong had been thinking since 1913 of floating steel islands anchored at suitable oceanic locations in as landing fields. From Armstrong's 1924 patent 1,511,153, "Sea Station,"

I, taking advantage of the fact that the wind waves of ocean storms are relatively only surface disturbances of the ocean (the greatest waves on record rarely creating any but the slightest movement at a depth of fifty feet below sea level) so design and construct a sea station that practically all of its effective displacement is below the disturbance of the maximum wave. By reason of this, it is subject to the action of waves to a minor extent only, and so remains practically undisturbed in even the most furious storms.

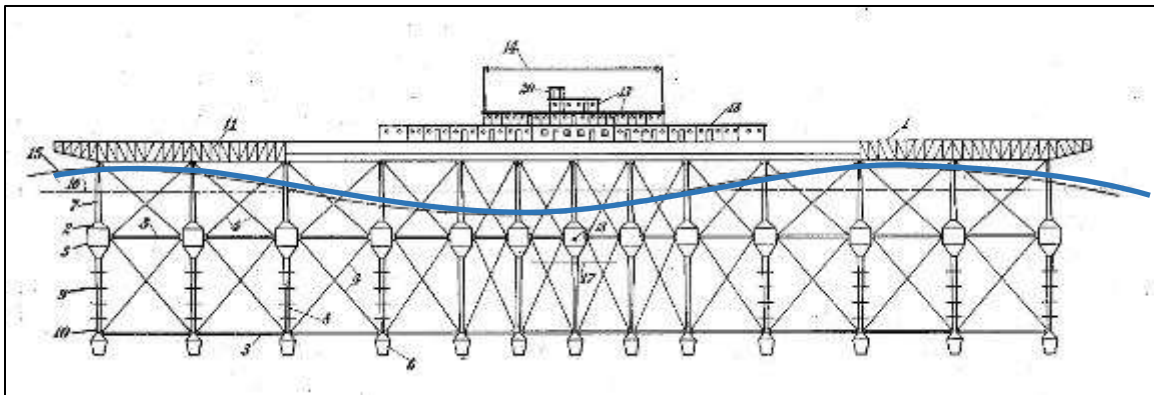
To give statical stability to the sea station, stabilizing sections are loaded with a suitable material, such as concrete, so that the center of gravity of the dock as a unit will be below the unit center of buoyancy of the displacement members.

"Statical stability" is nothing more than the equilibrium orientation wherein a floating object's gravity is directly below its displacement. While Armstrong correctly notes that that there is "the slightest movement" at sufficient submergence, he errs in presuming that an arm extending upward from such a point would itself be likewise quiescent.

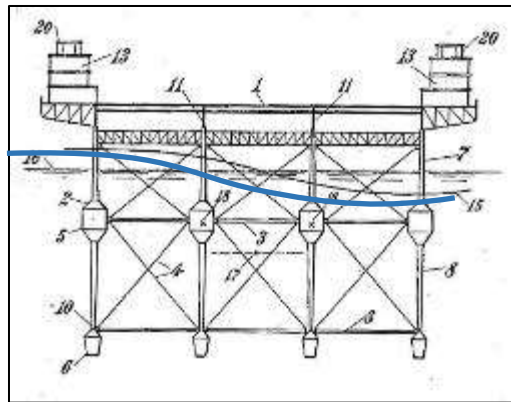
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The patent continues,

To illustrate the rolling and pitching forces that the sea station might be subjected to the approximate contour of a wave fifty feet high and eight hundred feet long is shown.



The action of a wave of this size on the deck structure of the sea station is effective only against section 7 of displacement members 2, which force is so small as compared with the resistance and inertia of sections 5, 6 and 8 and resistance collars 9 of the displacement members be practically negligible as a disturbing force within the relatively short period of the passing waves which or the size given would be about eight seconds.



Armstrong reasoned that placing 95 per cent of the structure's weight below sea level would assure complete stability even in the heaviest seas. Armstrong is fundamentally wrong in this respect. A free-floating end-weighted column of any length will bob up and down with the water surface. Ebb and flow of wave-action will rock a partially-submerged caisson like an inverted pendulum, the wave phase potentially amplifying the oscillation.

Armstrong's concept drew media attention. "Floating Islands for Transocean Air Routes," Science News-Letter 12:328, July 23, 1927.

To the developments of aviation that have come so speedily since the Wrights' first flights at Kitty Hawk, there must be added: Landing fields on artificial floating islands anchored far at sea.

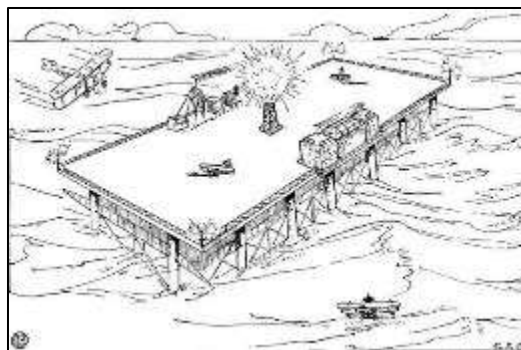
Engineers and air enthusiasts in the United States and other countries, who have been inventing and planning landing fields in the sea, are no longer looked upon as dreamers or worse. Transoceanic aeronautics is ready for seadromes, aviation experts believe. They visualize floating fields at intervals of four or five hundred miles, lighted at night, strung together by route buoys and light beacons and equipped with fog signals and directional radio that will make the airways safe. Transoceanic flying companies will carry us, our mail and our freight at no greater cost and at a much greater speed than by boat at the present time

No, we are not dreaming to wake up and find the world the same slow, old jogtrotter. The mine-sweepers are already in commission to haul a seadrome, designed by Edward R. Armstrong of

E. I. du Pont de Nemours Company of Wilmington, Del., 500 miles to sea. Private capital is behind it, and the Navy has been asked to station observers to watch it work.

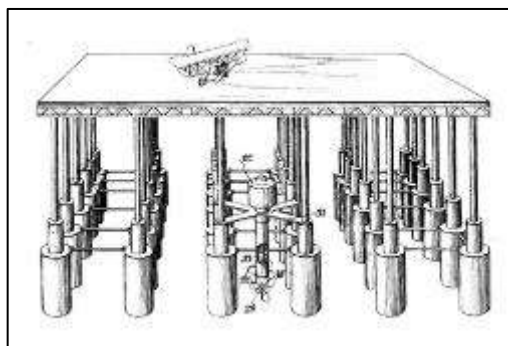
This test seadrome, about 150 feet square, will be anchored where the water is about three miles deep, in the deepest "water hole" along the steamship lanes between North America and Europe. Future full-sized docks will be 1,200 feet long, have an area of about three acres and a displacement of about 15,000 tons.

The seadrome will be anchored by steel cables built to stand a stress double the maximum they will actually experience. These cables must be more than 20,000 feet long in water "holes."



Armstrong wasn't the only inventor in the game. "Landing Platform for Airplanes," Patent 1,718,006 (1929) by Jesse W. Reno envisioned a floating airfield that could be moved by means of a propeller

It can be floated on the surface of the sea; that it shall be comparatively free from disturbance due to the waves created by storms; that it shall combine, with ample strength and rigidity, sufficient flexibility so as not to be strained by motion of the water supporting it; that it shall be capable of propelling itself in any direction to counteract the tendency of the wind to carry it away from a fixed position in which it is desired to maintain it; and that it shall be capable of being easily assembled and erected and of having its individual pontoons and /or propelling mechanism raised above the water for repair and adjustment.



How Reno's propeller could propel the massive structure is yet to be figured out.

Eight "Armstrong Seadromes" between the 35th and 40th parallels and some 375 miles apart were proposed between New York and Plymouth, England a manageable set of hops for any airplane.



From a press release,

Planes then would be able to leave New York .at 6 o'clock in the morning and arrive at Plymouth England, at 4:30 o'clock the following afternoon.

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The Seadrome Ocean Dock Corporation's original plan called for a sixth drome to be anchored between No. 5 and Ireland, and thus permit direct operation between Great Britain and Ireland and North America.

Charles Lindbergh did his part to encourage interest.

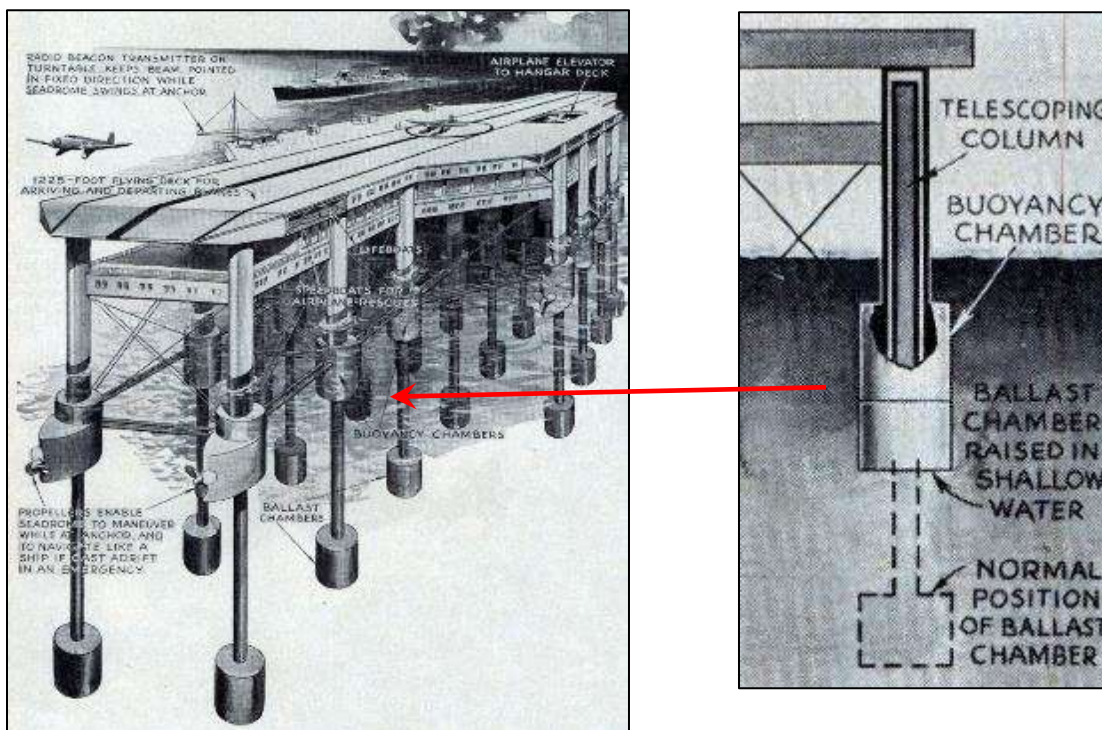
In my opinion...there will be floating islands where planes may land, reshipe their mail, cargo and passengers into a fresh plane with a new pilot who will take off for the next point,

The Seadrome deck would be 1,200 feet in length; the ends of the platform 200 feet wide and at the middle, 150 to 400 feet, a dimension changing with engineering study. Whereas Reno's floating platform was square, allowing landing and takeoffs from any direction, Armstrong's Seadrome would be turned into the wind. The Seadrome's bulged deck provided for a hangar, meteorological station and radio equipment on one side and living space for crew and air passengers on the other. Later plans moved the ancillary buildings below deck.

For modern comparison, 6,000 feet of runway is desirable for a fully loaded Boeing 737. Aircraft carrier runways, on the other hand, are in the order of 1000 feet long, as aircraft are catapulted with after-burners ignited. Landing aircraft employ a tail-hook. The Seadrome afforded no such assistance.

The DC-3, developed in the early 1930s, required 1500 feet for takeoff, and 2080 feet for landing. Though Armstrong marked his concept as a plan for the future, it was at best sized for the day.

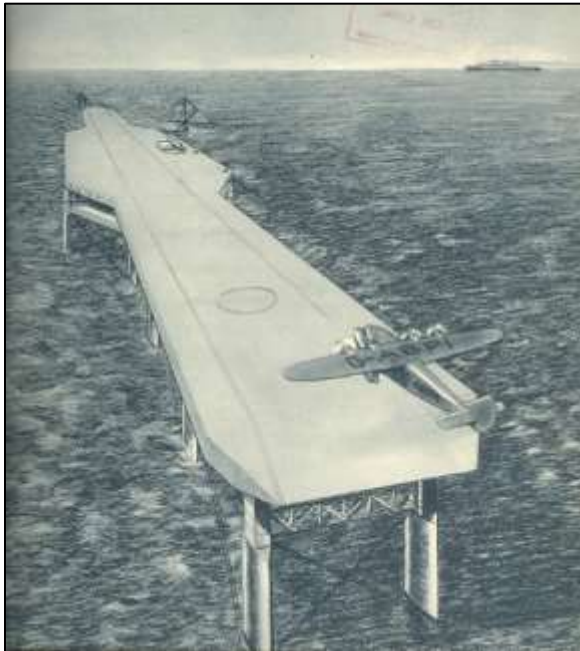
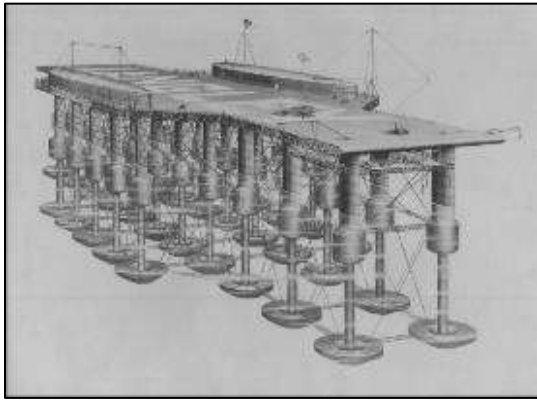
The upper deck would be as much as 100 feet above sea level. Between 32 and 60 tubular columns, 15 to 30 feet in diameter, would extend to buoyancy tanks, and from there to chambers ballasted with cast iron or iron ore 100 feet below the surface. Armstrong's assertion that ocean waves would harmlessly sweep between the ballast tanks and the deck, was incorrect, but no one seemed to challenge it.



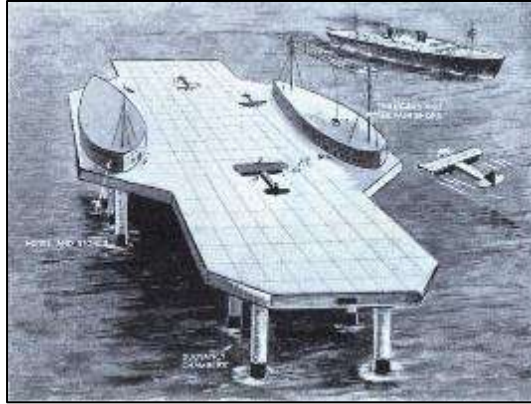
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A few renditions,



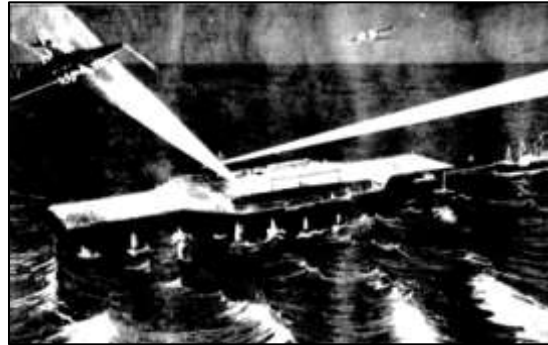
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Floodlights would allow nighttime operation.

The pilots will be guided by a radio beam which will give them their directions between "dromes." In case of a severe storm or inclement weather conditions, planes will not take off on schedule, but will remain on the drome until the elements calm down.

Aircraft will be guided to the island airport by a standard type of radio beacon, which is mounted on an automatic turntable controlled by a gyro compass. No matter how the seadrome may swing at anchor, the beam will always point in a fixed direction.



We'll defer to Chapter 72.8 details of how Armstrong proposed to anchor his airport to the ocean floor, but should the mooring fail, Armstrong designed a propulsion system using electric motors to hold the 50,000-ton Seadrome in place. The inventor thought that 500 horsepower would suffice.

Armstrong demonstrated his design by use of scale models, but as we will note in Chapter 76 -- and might be suspected by Armstrong's horsepower estimate -- the inventor's forte was one of salesmanship, not marine engineering.

Each Seadrome would be commanded by a captain, a first and second officer. The crew would consist of six seamen, a chief engineer, three assistant engineers, three firemen, three oilers, four mechanics, a steward, three cooks, three cooks' helpers, five mess boys, a radio chief, three assistant radio operators, two meteorologists and a physician. A below-deck hotel would eventually employ 125.

The cost for five Seadromes was estimated at \$34 million, with another \$3 million annually for operation and maintenance. Armstrong believed that money from airmail and a 20 percent tax on passenger tickets would bring in \$4 to \$6 million per year.

Aviation pioneer Louis Bleriot's endorsement in the New York Times, July 30, 1929.



June 1929



February 1931

Skeptics

The workability of Armstrong's floating islands didn't convince everybody, however, "Transatlantic Air Service Seen as a Costly Venture," New York Times, November 13, 1927, being one example.

Mr. Armstrong does not mention the cost of his numerous anchored floating islands, his means of anchoring them in 6,000 feet of water, nor his ability to head them into the wind to permit airplanes to land when tide and current are not in the same direction as the wind. Mr. Armstrong has not discussed the means of providing satisfactory food and sleeping accommodations each of these landing stages, nor the crews which these stations would require, nor the fueling, housing and servicing of the planes. Further, how does he intend to land supplies in stormy weather?

I do not think a hotel in the middle of the North Atlantic on a little steel island, no matter how stable the island may prove to be, will be very popular, and I believe one would have considerable difficulty recruiting a personnel willing to live under such conditions. I cannot, therefore, quite agree with Mr. Armstrong that "on the air route, with stations 400 miles apart, a crew of two would be required on each plane or one on duty for every ten passengers," for we

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must add to this the landing stage crews. I also expect that Mr. Armstrong does not contemplate that his crews can fly continuously.

As its headline suggests, "Floating Islands Raise Problems. Will American Planned Oceanic Anchorages for Airplane Landing Places Cause International Complications Over Control of the Submarine Mountain Tops?" Washington Post, August 24, 1930, raises issues, a few of which we'll note.

What is going to be, the attitude of other nations?

These floating islands involve the creation of artificial territory. Presumably such seadromes will be under the flag of the United States. Will they be dealt with as so many American hulks under the maritime code of the nations? Will they be regarded as permanent installations admittedly having nothing of a navigable character about them beyond their seaworthiness?

Whose police will be on these floating' islands? What court will render justice?

Consider, too, the world's shipping. Even though it is planned to equip them with lighthouses, these islands will be hazards to navigation... Who has the right of way -- steamships of air traffic, with its new use of the ocean surface?

If the American engineering genius, with the scientific exploration of the ocean's subsurface aiding, carries these floating islands to the European coast, what will be the attitude of foreign powers?... Irrespective of their public or private status, will they have weapons for defense?

The appearance of the seadrome on the horizon of world politics can change instantly the whole situation.

"Skeptical of Seadromes," New York Times, November 23, 1933, likewise notes difficulties.

In the matter of an anchored raft In the middle of the Atlantic, it would hardly be possible for the present administration to justify its policies of economy in bestowing this experiment on an impoverished nation. It is a suggestion that could kindle only an infantile imagination.

Anyone who has seen chunks of water as large as houses lurching crazily around on the hills and valleys of a storm-tossed North Atlantic will appreciate at once the folly of a floating island, however stoutly chained in place it may be. The strains and stresses of a stormy week would end its: usefulness.

Our spirit of adventure had its fling in 1929. It is time to curb it with a little common sense. Our best adventure is economy. We have not put a thrill in it as yet.

Armstrong's plans remained in hiatus until Roosevelt's Public Works Administration expressed interest the Seadrome's capacity to give 10,000 men two years of construction work. From "Aeronautics: Sea Chain," Time, November 27, 1933,

A perennial gift to Sunday feature editors for the last five years has been the Armstrong Seadrome, vividly imaginative project for a chain of floating airports across the Atlantic. The perfect publicity subject, it offered serious readers masses of data on construction of huge platforms, stabilized high above the waves by means of weighted pillars, on problems of anchorage, navigation, operation, economics. For gumchewers there were exciting pictures of a seadrome at night, in mid-ocean position, with flags flying, floodlights blazing, beacons stabbing the dark sky, gorgeous express planes gliding down to safe landings. Even the windows of the drome's elegant hotel underlying the deck were pricked out with cozy lights.

Last week the Armstrong Seadrome leaped out of its accustomed setting in the feature supplements to land on page one of the nation's press when the Federal Government indicated that it was ready to help finance the project, that it might even build and operate the whole system itself.

But nothing came of the PWA interest.

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The Seadrome's swan-song was Armstrong's full-page ad in the May 14, 1943 New York Times yet touting an endeavor that would be "as practical as a piece of steel," but as a military tactic, the floating-airfield concept had the highest backing. According to Winston Churchill's memorandum to General Ismay, December 7, 1942.

The advantages of a floating island or island .are so dazzling that they do not at the moment need to be discussed. There would be no difficulty in finding a place to put such a "steppingstone" in any of the plans of war now under consideration.

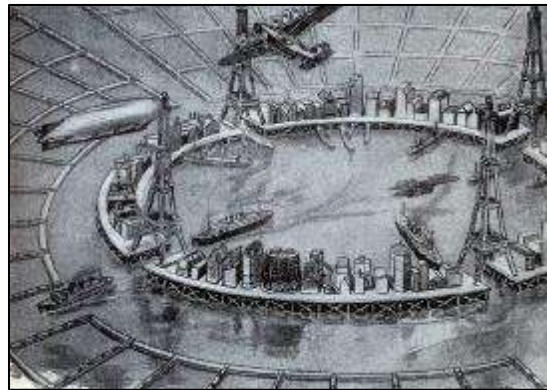
Efforts by Others

"French Engineer Plans Huge Floating Mid-Ocean City," Mechanics Illustrated, March 1931, offers another design.

When the continents of the world have become overcrowded and trans-oceanic airplane travel is as common as travel by steamers at present, we may see the establishment of huge mid-ocean cities such as is shown in the above drawing, which illustrates the plans recently made by Leon Feoquinos, a French engineer of Marseilles.

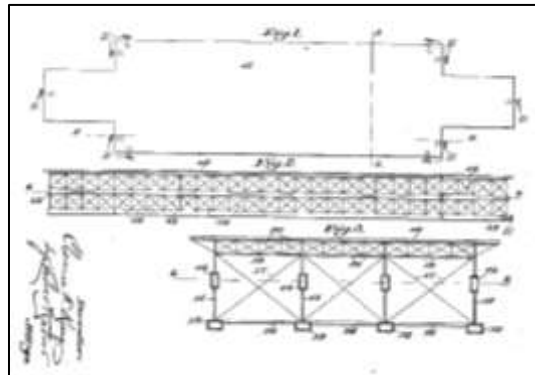
The foundation is to be a network of steel sections, held together with cables, to act as a gigantic breakwater against the heavy seas. In the center there will be a large enclosed harbor that will serve as a landing place for hydroplanes and a port for ocean liners. Later other features will be added, such as a spacious hotel, gaming casino, and four huge towers.

Midway between Bordeaux, France, and St. Johns, Newfoundland. The outer steel network will serve as a breakwater and the harbor inside will serve as a trans-Atlantic hydroplane station.



1932 was a banner year for floating airfield proponents.

"Floating Landing Stage," Patent 1,854,336 (1932) by Clarence King contains little technical advancement, but shows that thinkers were busy.



Horizons (1932) by Norman Bel Geddes celebrates architectural imagination.

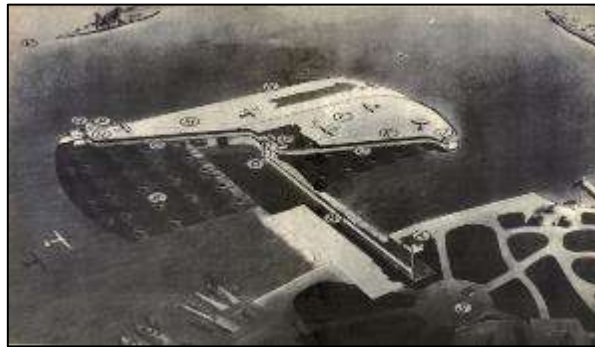
To merely suggest the idea of locating a floating airport anywhere in the navigable portions of New York Harbor, with its tugs, lighters, barges, ferries and sight-seeing boats, brings endless protest from the owners and operators of these harbor craft. Nevertheless this location is ideal for such an airport in terms of proximity to the financial center, unobstructed landing area,

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relatively stable and uniform winds, excellent land transportation facilities, and lack of interference with vessels of deep draft.

As .a possible solution to the airport problem New York City will ultimately face, I have designed this floating airport for the accommodation of land planes. It is a large deck fifteen hundred feet long by seven hundred and fifty feet wide and consists of a continuous strip twice doubling back upon itself to make three spaces separated by three-foot curbs. The traffic through these strips is one of continuous motion. One strip is for landing, the middle one is a taxi strip, and the third is a take-off strip. On the top of the dividing wall are mounted green and red boundary lights visible from the air, while the entire deck is flooded with light from the two passenger shelters located at the end of the landing strip and at the start of the take-off strip.

The weight of this floating airport is supported by columns upon ballasted buoyancy tanks. These tanks, located below the portion of the water disturbed by surface waves, keep the deck level in all weather, the waves passing easily around the columns and under the bottom of the deck structure. The landing deck rotates with the wind to give ideal landing and take-off facilities. This rotation is accomplished by motor-driven marine propellers located at the extremities of the long axis of the deck below the water surface.

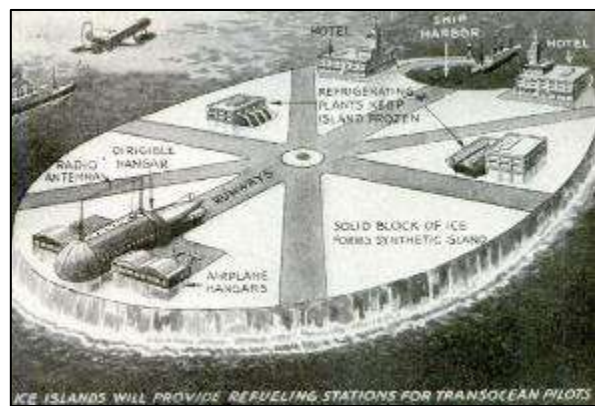


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An airport over the Seine, designed by M. Lurcat, from Science and Mechanics, June 1932, was much the same.



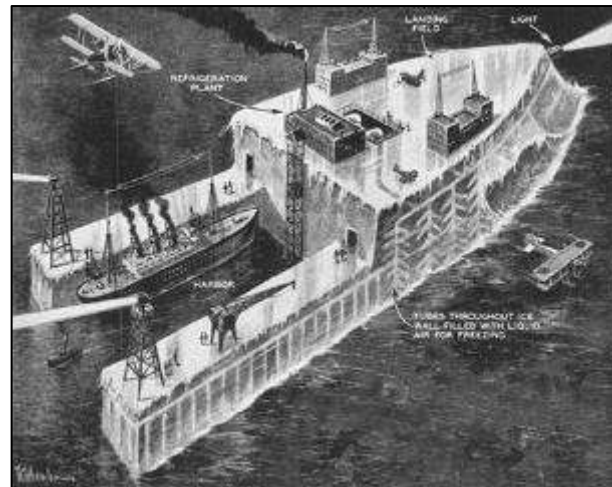
in "Ocean Airports of Artificial Ice," Popular Science, September 1932, German engineer, A. Gerke predicts that giant "islands of ice" will soon dot the oceans, serving as airports, dirigible hangars, hotels and docks for ocean liners. Refrigeration equipment will allow such ports to be built even in warm waters.



"Ice-Island in Mid-Atlantic Proposed," Modern Mechanix, October 1932, employs ice.

Seadromes for ocean landing fields are not a new idea, a steel drome designed by Edward Armstrong, recently described in these pages, being well on the road to practical acceptance. But the proposal to build seadromes of ice, recently advanced from Germany, seems fantastic until one realizes that the idea has already passed the experimental stage with flying colors

A "Landing Field" is identified in the upper center, but there's no length for one.



The article continues,

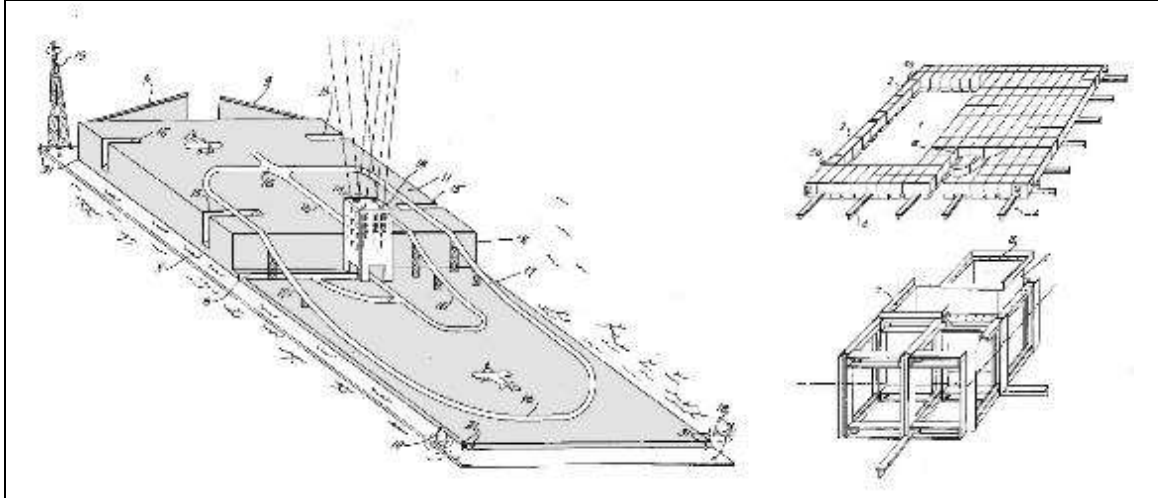
The German scientist Dr. Gerke of Waldenburg two years ago erected an ice island in Lake Zurich by artificial means, which endured six days after the refrigerating machinery was switched off. His proposal for a mid-Atlantic way station of ice involves the construction of a

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framework of hollow tubing which; when filled with liquid air manufactured in a refrigerating plant, freezes the water surrounding it into a solid mass.

Design of the island would call for a section on which a landing field and buildings for offices and refrigerating plants could be built.

"Floating Airport," Patent 1,896,546 (1933) by I. Kulik,



The object of the present invention is to provide a buoyant airport which will constitute a substantially complete aviation field with housing facilities for aircraft, appropriate runways, repair shops, hotel accommodations and other facilities which go to make up a complete unit for the care and maintenance of aircraft, and the housing and comfort of the operating personnel and passengers.

I also consider as highly novel the employment about the floating port of a submerged shelf which extends outwardly from the margins of the landing stages submerged a short distance below the surface so that if accidents should occur adjacent these landing surfaces which would bring about sinking of aircraft adjacent thereto, such aircraft will come to rest below the surface of the water on this shelf and can be readily recovered.

The buoys connected to the port, in the manner described, can prevent undue submersion of the port during the impact of landing of a heavy aircraft on the port, while the shelf will tend to steady the port during the impact and will prevent a sudden bobbing up of the port out of the water when an aircraft takes off from the float and thus suddenly lessens the load on the float.

The shelf which is submerged below the surface of the port and alongside of the port serves as an artificial bottom upon which a boat can drop an anchor. At the same time the flat and wide submerged shelf can break up and dissipate the roll of a wave or waves to prevent the rocking of the port.

"'Halfway House' in Ocean Westfalen Soon to Be Anchored in Mid-Atlantic to Serve as Base for Air Line," New York Sun, July 15, 1933, challenges the rescue role touted for permanently-anchored structures..

After many years of prophecy and experimentation, a floating "halfway house" for transoceanic planes may soon appear on the Atlantic Ocean between Africa and South America, on a proposed air route linking Berlin and leading South American cities. The ocean airfield, says a bulletin of the National Geographic Society, will be the Westfalen, a 5,130-ton vessel which has been successfully used in experiments in the North Sea.

The first section of the route lies between Berlin and Cadiz, Spain; the second between Cadiz and Bathurst, Gambia, on the west coast of Africa, and the third will be the 1,950-mile

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transatlantic section between Bathurst and Pernambuco (Recife), easternmost city of the South American coastline.

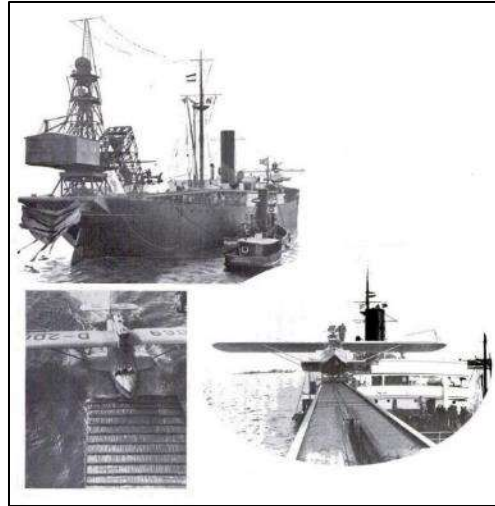
Waterplanes will be used on the second and third sections. The Canary Islands form an emergency landing place for the second section. Between Bathurst and Pernambuco, however, the Atlantic Ocean is without land, and the Westfalen will be anchored somewhere between these clues

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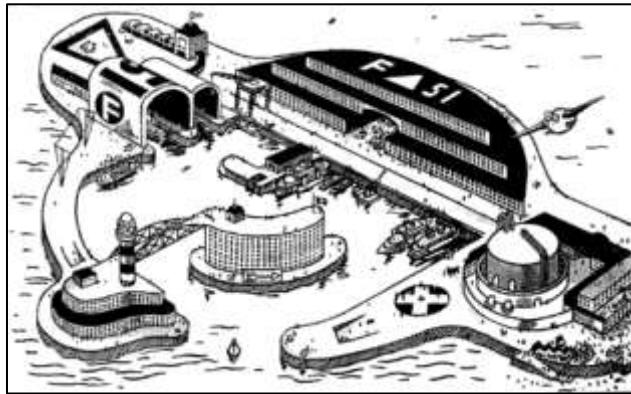
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The Westfalen, according to those who have flown the south Atlantic, will be more satisfactory than a "floating island" of non-ship type, because it will not be permanently anchored. It will go to the assistance of stranded planes at the rate of twelve and one-half knots.

Constructed as a cargo ship in 1906, the Westfalen was converted into a seaplane tender in the 1930s for Lufthansa flying boats carrying mail -- not passengers -- between Europe and South America. The planes landed on a stern-mounted canvas drag apron, from which cranes lifted them to be refueled and serviced, and were re-launched by a compressed-air catapult. The Westfalen was used in World War II for transport between Germany and occupied Norway and was sunk by a mine in 1944.



Zig et Puce, 1934, just a French comic book, perhaps, but indicative of how the concept had seized the public's imagination.



"Test Air Base for Ocean Service," Elmira Star Gazette, July 3, 1937, describes a sister ship.

Floating air bases in mid-ocean are being tested by the Lufthansa, German airplane company, for use as service and refueling stations on its North Atlantic commercial service. The "Friesenland," largest of four vessels to be used for that purpose, is shown. Giant cranes... to lift the huge transport planes out of the water and onto the deck will be part of the floating "island" equipment, enabling the ships for inspection.



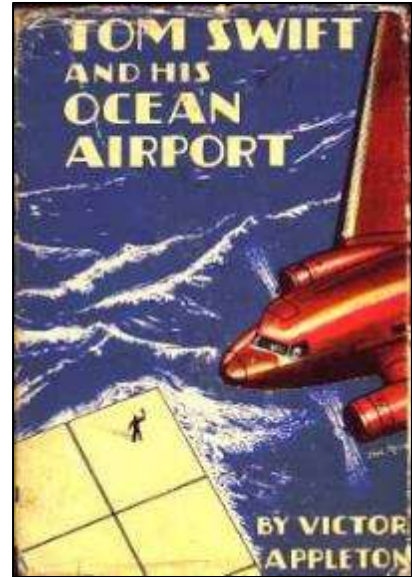
An unemployed public is a reading public, and #37 of the Tom Swift series, Tom Swift and His Ocean Airport (1934) by Victor Appleton fit the bill. We'll summarize.

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"Mayday! Mayday!! I am going down!!!" The cry for help over the ether heralds the beginning of a new adventure for Tom. Boyhood chum Jerry Mason, on a solo record-setting distance crossing of the Atlantic, is being forced down by a rival flyer.

Tom decides that an island airport 2000 miles from the Azores might have saved his buddy. Such an airport could also be used as an American mid-ocean refueling station, Swift Construction, previously in dire financial distress -- this Depression will end, folks -- is up to the task.

After some difficulty, Tom gets his special wood, "talcap," light, strong and buoyant, from revolution-prone Haargoland in Central America and builds his airport. After construction, however, the Haargoland navy arrives to claim it on the grounds that Tom had no right to take the wood. Tom has the U.S. Navy at his call, but before Uncle Sam can claim the airport, diplomatic ceremonies must occur. The diplomats to perform these ceremonies are on board an airplane which gets caught in an Atlantic storm and it's up to Tom and his new Ocean Airport to set things right.



Tom's Ocean Airport is comprised of 36 square segments, each 300 feet on a side, laid out in a 6 by 6 grid, resulting in a raft 1800 feet square. Each segment has an open grid construction to minimize the effect of wave action, a submerged weighted keel for stability and wireless-electric powered electromagnets to hold the segments together. The segments can be detached during a storm to minimize damage from waves. Each section has marker lights so it can be found if separated.

Appleton doesn't tell us that the "talcap" would have to be treated to remain waterproof for any length of time and stay unpalatable to sea-critters. No provision seems to have been made for runway lights, beacons, hangars, fuel stores, maintenance/repair facilities or other amenities.

But back to schemes not labeled as fiction.

Bleriot remained an active proponent, as evidenced by "Wings Over the Sea: Are Landing Places Necessary for the Commercial Aerial Crossing of the North Atlantic?" Annual Report of the Board of Regents of the Smithsonian Institution (1935).

"French Ponder West Air Link," North Tonawanda Evening News, September 6, 1935,

The suggestion has been made here that Clipperton Island, tiny French possession in the Pacific for which no use heretofore has been discovered, would make an ideal seaplane landing base for a trans-Pacific air route.

Such a route leading across the Pacific from Mexico City by way of Clipperton, the Marquis Islands, Fiji and perhaps eventually Manila, would be of interest to the United States as well as France. Clipperton is only about two miles across at its widest point and varies in width between a mile and a half and two miles, but what makes it of interest to fliers is the fact that in the midst of its barren coral surface is a broad sheltered lagoon considered ideal as a landing place.

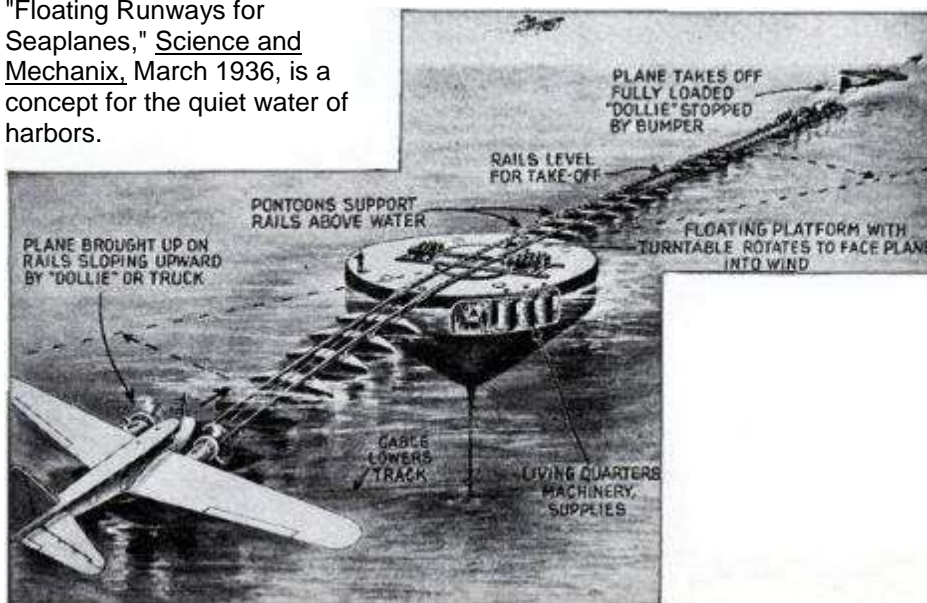
Clipperton is roughly 1,000 miles by air from Mexico City, and it is figured that a feasible air route could be set up by the construction of one floating island between Clipperton and the Marquis.

Midway, in the Pacific's Center, Becomes an Important American Air Terminal," Washington Post, June 16, 1935,

The selection of Midway and the development of the Clipper planes capable of flying the 2,400-mile hop from California to Hawaii seems to write a definite "finis" to plans for the establishment of a series of floating island airports at various points along the ocean airline.

Military and naval authorities never have looked with favor on the construction of the floating islands that might be converted into wartime bases for the operation of fighting planes. These authorities have stated that America's highly prized isolation might be seriously affected if a program for the development of the seadromes was adopted,

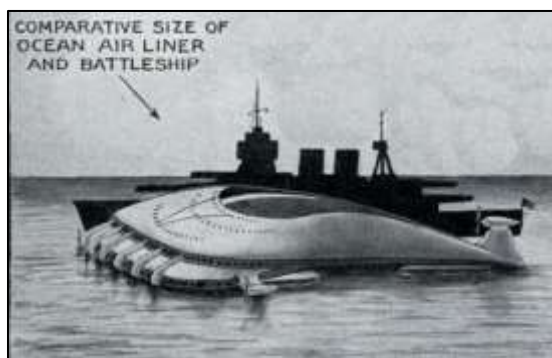
"Floating Runways for Seaplanes," Science and Mechanix, March 1936, is a concept for the quiet water of harbors.



Build a plane big enough, it becomes the island. "The 'Dynamic Control' Ocean Liner," Modern Mechanix, November 1934, by Hugo Gernsback,

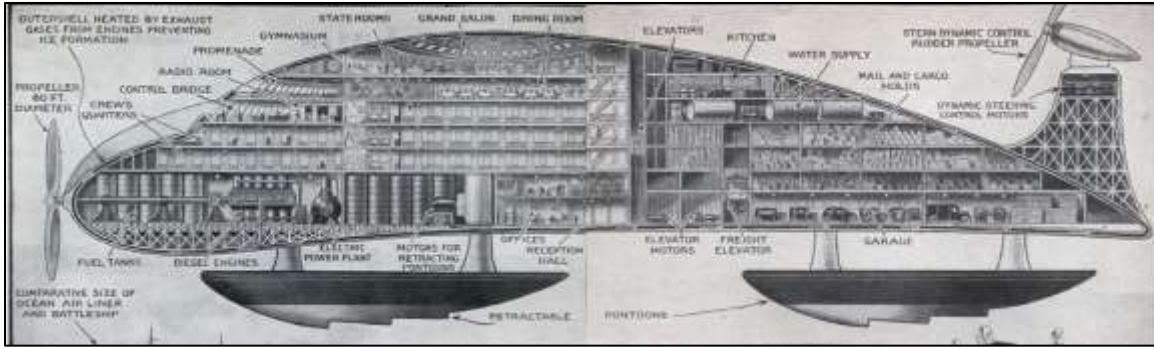
From the earliest Wright airplane, which weighed approximately 1/2 ton, to the present record holder, the DOX, which weighed fifty tons, took a period of some 26 years. The 10,000 ton airplane, projected on a like time-scale, would, therefore, make its appearance not later than the year 1952. However, with the nature of the present-day technique, it is quite possible, at this moment, that the 10,000 ton plane will be here much sooner.

(For comparison, a Boeing 747 weight 300 tons.)



It is already becoming apparent that ideas of the ordinary ocean liners are more and more embodied in airplane construction; and in all probability this tendency will be followed in years to come. In other words, what we will have is a flying ocean liner that is not only airworthy, but is seaworthy as well. It is also a foregone conclusion that when a 10,000-ton aircraft is built, it will not be a land-type plane but for obvious reasons will have to land in water.

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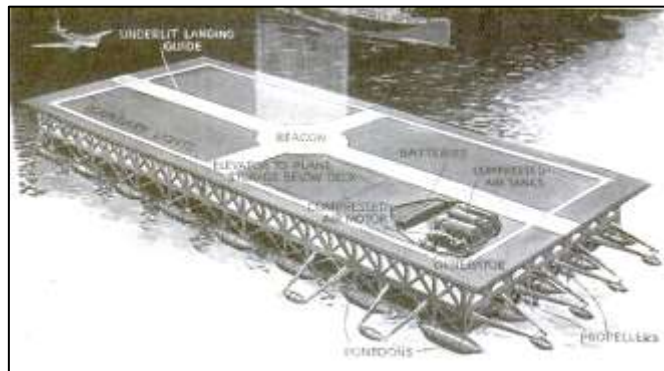


"Seadrome for Mid-Pacific Planned by Australian," Los Angeles Times. July 9. 1937,

Plans for a \$20,000,000 seadrome in mid-Pacific -- a giant floating island -- were advanced in Los Angeles yesterday by M.E. Heiser, Australian civil engineer, now in the United States to enlist sponsorship for the project.

"Power From Waves," Popular Science, May 1937, sees the potential of wave energy.

A floating landing field for transoceanic planes just designed by a French inventor, utilizes wave-operated outrigger floats to generate power for its lights and propelling machinery. Operating through a system of levers, the floats drive large air compressors. The air is then used to run a dynamo for electricity and to drive the propellers which will keep the marine airport stationary against the action of strong winds and currents.



World War II

Ever poised to rise to his nation's needs, especially a time in which his original idea had fallen into disfavor, Armstrong saw World War II as an new possibility, hence, his 1942 US Patent 2399611A, the Vernean "Submersible Seadrome."

The standard seadrome design has been modified in accordance with the present invention so that a structure of this type can be quickly and safely submersed below the surface of the ocean to that depth necessary to render bombing from the air ineffective, even if its general location should become known to the enemy.

In essence, the buoyancy chambers could be flooded and the "haul down" mechanism be engaged to drop the mid-ocean structure 50 feet below Nazi eyes, and then refloated for retaliatory airstrikes.

Before causing the control room to emerge above water level, the periscope equipment contained therein may be utilized to make the desired observations.

No mention is made of U-boats and torpedoes, or, for that matter, the selling-points of Armstrongs 1920s concept that wouldn't work in the redesign. For what the submersible scheme lacks in feasibility, it compensates in imagination. We'll discuss its anchoring in Chapter 73.

Early in 1942, English inventor Ronald Hamilton deemed that his theory of "Rolling Dynamic Buoyancy," based on water's natural surface tension, the property that allows waterbugs to skitter

Chapter 57 -- Land an Airplane

over the surface without sinking, could be adapted to build a floating airfield. While his physical justification was incorrect, his experiments proved to be somewhat successful based on the simpler rationale of buoyancy (Chapter 19).

Hamilton's design employed hundreds of welded steel hexagonal cans, 6 feet across and 2.5 feet 6 deep, fitted together honey-comb-like in a flexible, continuous mat. Subsurface baffles controlled the flexibility.

The British code named the project, "Lily".

Full-scale trials were carried out in 1944 off the Isle of Arran, Scotland. A team of 40 men assembled a floating runway 550 feet long and 60 feet wide in one hour.

A weight of a Fairey Swordfish torpedo bomber made a shallow, saucer-like depression in the runway. The rocket-assisted Swordfish took a somewhat longer distance than usual to take off because as the airplane moved down the runway, it was constantly trying to climb out of its own depression. The same effect reduced the distance needed for landing.

Hamilton calculated that a raft 1,200 feet long and 90 feet wide could accommodate Hurricane fighters in winds up to 60 miles/hour.



In 1943, U.S. Navy Seabees constructed a 10,920-pontoon-supported floating airfield, 1810 by 272-foot, having a parallel taxiway and seven cross taxiways. Code named SOCK, in its time it was the largest floating structure in the world.

SOCK was towed to sea off the Rhode Island coast and bombed with both instant and delayed fuse explosives. Repairs were made in eight hours.

SOCK revealed a characteristic new to Navy pilots -- wave effects propagating through the entire the runway.



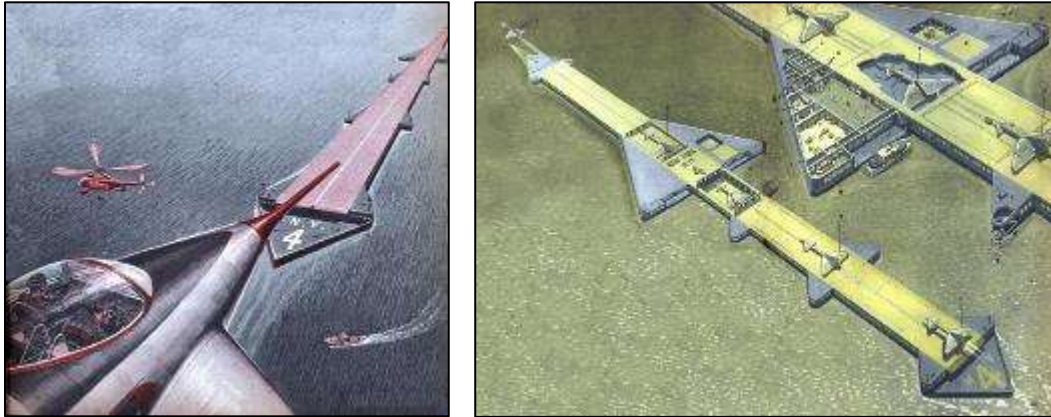
Great Britain's greatest floating-island scheme of World War II was Project Habbakuk, but as the material was ice, and the study was by modeling, the discussion is relegated to Chapters 60 and 76.

The demise of all floating airfield efforts came in August 1943, when Portugal allowed the Allies to use the Azores -- once part of the Armstrong route -- for more solidly-footed airfields,

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Post World War II

"Why Don't We Build Floating Airports?" asked Mechanix Illustrated, December 1952.



Now, Ronald M. Hamilton, Lily's English designer, proposes a modernization of the plan to provide safe, floating airports for American cities. M.I.'s visualization of one is shown in the accompanying illustrations. Shaped like an arrow always pointed into the wind, the strip consists of a rigid, two-story structure supported by a flotation base of individually mounted watertight tanks.

The islands also contain sub-surface engine rooms in which powerful diesels are mounted to drive water propellers. These operate automatically to keep the airstrip headed into the wind and are governed by a master wind-vane on the forward deck. The incoming plane touches down just inside the after end of the flight deck and is halted by arrestor gear at the first island. A deck handling tractor then couples to the nose-wheel gear and tows the plane to the "down" elevator. Painted tracks on this portion of the deck help keep it in alignment.

A city like New York could anchor a whole string of these airports in nearby Long Island Sound, the Lower Bay or even in the Hudson River where landing approaches and take-offs could be made over uninhabited stretches of water. Accessibility would be at least as good as that of the present airports and with helicopter taxi service, it would be better. Most of the other great centers of our country are similarly situated. Why don't we build floating airports to make air travel safer and save our cities?

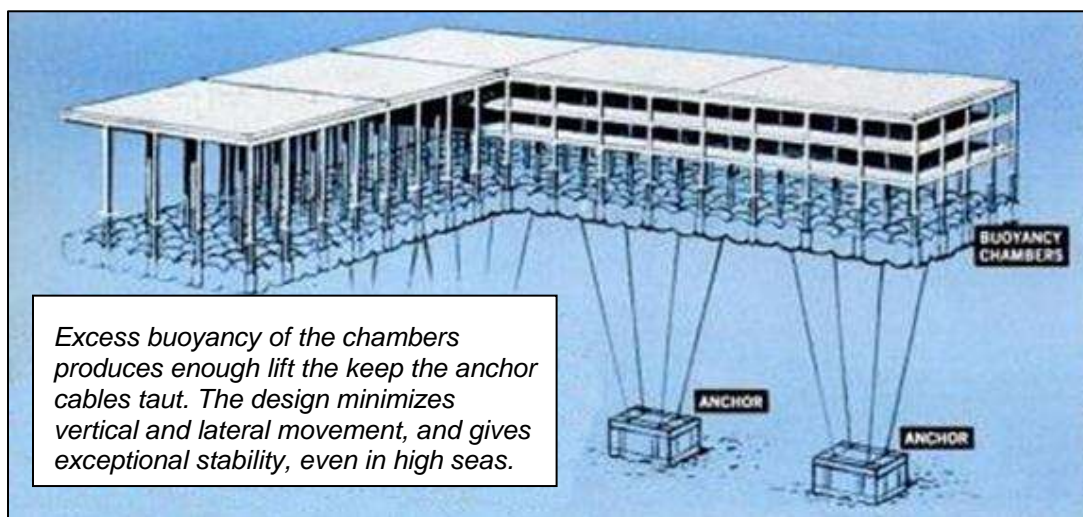
Postage stamp from Monaco 1955 honoring Jules Verne, showing a Ville Flottante with landing deck. All but the principal runway are impracticably short, however, and having elevated structures in line with the runway is decidedly unwise.



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"FLAIR -- The 'Way Out' Floating Airport," *Popular Science*, August 1970, foresaw a 12,000 by 6,600 foot airstrip anchored 40 to 50 miles from New York City,. Note the jet in the illustration.

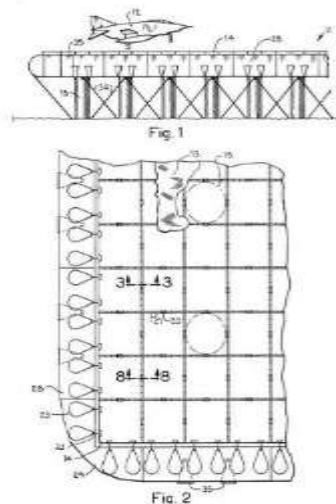
The structure would be comprised of 200 by 200-foot prefabricated modules, each moored by four cables to a 1075-ton concrete anchor.



1972 patent 3771484 A, "Inflatable Floating Island,"

An inflatable floating island suitable for use as a landing field for aircraft having a plurality of inflatable bags serving as floor beams and a plurality of panels positioned on top of said bags to serve as a landing surface. Adjacent panels are keyed together to have the panels work as one large panel. The inflatable bags are supported by long cylindrical flotation bags that are partially filled with water to provide a stable platform.

By way of example, flotation columns might be 8 feet in diameter and 125 feet in length and means are provided for supplying air and water to the inside of flotation columns. The primary function of flotation columns is that of furnishing buoyant support of the floor beams, as well as everything that the floor beams support.



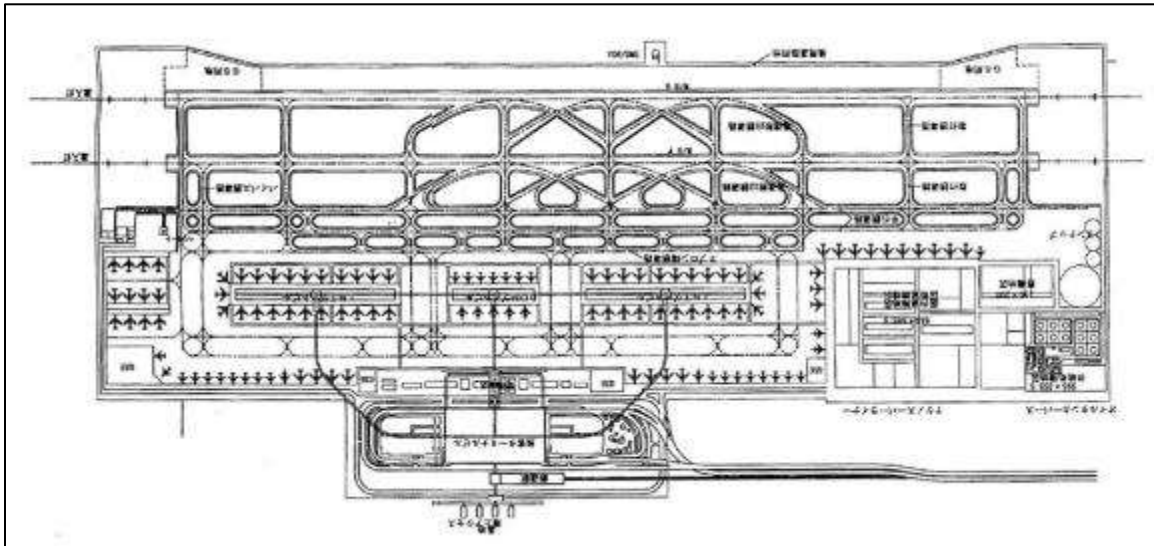
A second function of flotation columns is to provide attenuation of the forces of waves by reaching deep into the sea. By way of example, if flotation columns are filled with water 93 feet deep, the bottoms of floor beams will be positioned about 25 feet above the surface of the sea.

Chapter 57 -- Land an Airplane

The Japanese undertook the challenge of a floating airport as a national project in 1995, calling it "Mega-Float."



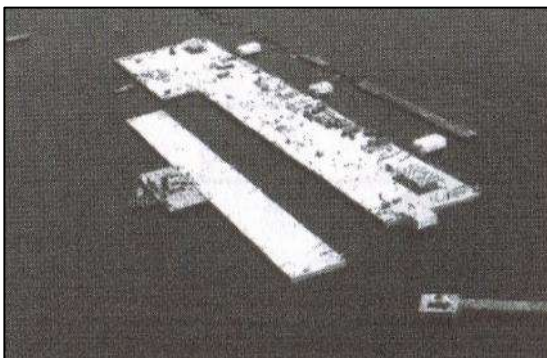
Conceptual drawing



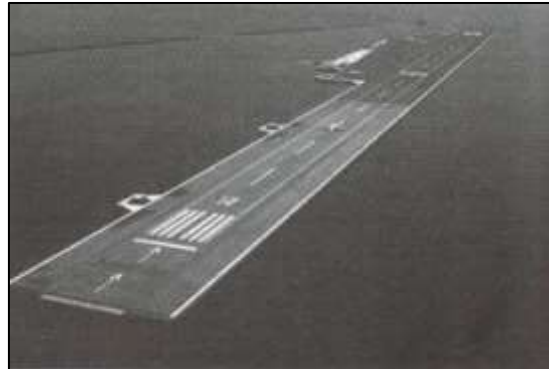
4000-meter Mega-Float

Chapter 76 pursues the scale modeling results.

A 300 by 60-meter floating platform was built behind an existing breakwater in Tokyo Bay in 1998, and to it were affixed five additional modules, together forming a 1000-meter floating airstrip for operational testing.



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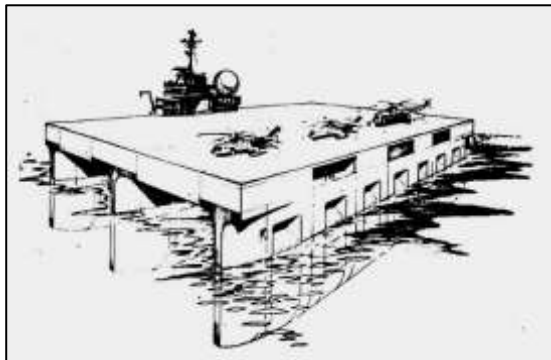
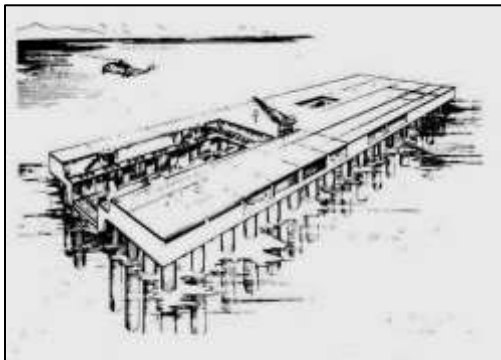
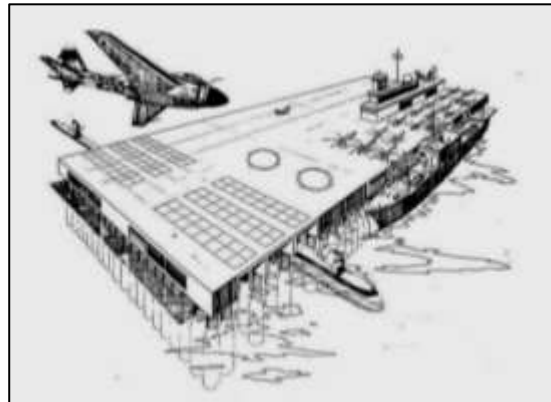


The test runway was awarded the world's largest man-made floating island in the 1999 Guinness Book of Records.

The largest man-made floating island is the Mega-Float, which was opened to the public in 1999 at Yokosuka Port, Tokyo Bay, Tokyo, Japan. The steel-built structure measures 1,000 meters in length, 121 meters wide and 3 meters deep.

Test landings indicated that Mega-Float's hydro-elastic response would not jeopardize aviation operations. Final design, however, reverted to an artificial island of fill. The 1000-meter test structure was dismantled and portions are today used for a ferry pier and for sport fishing.

The U.S. Office of Naval Research has investigated the feasibility of a Mobile Offshore Base, a self-propelled modular platform forming a 1500-meter runway for logistical support of military operations.



Cylindrical legged and trimaran designs

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According to The International Legal Implications of the Mobile Offshore Base (1997) by Christopher Strub,

The central purpose of the Mobile Offshore Base scheme is to provide for a U.S. overseas power projection capability without the potentially entangling encumbrance of a land base on foreign territory

The system's advocates propose that the MOB modules would travel to an uncontested area of the ocean and be assembled to provide logistics, command and control, and a forward presence capability to the theater commander.

More straightforwardly from Admiral William Owens, author of High Seas: The Naval Passage to an Uncharted World (1995), the purpose of the base would be to

Have an island wherever we wanted one

The system would be anchored and kept in constant geo-position with thruster units with the ability to detach each module and maneuver at up to 8 knots, if necessary. The ONR research program concluded in 2000 that it is possible to build such a base with present knowledge and technology.

Envisioned Joint Mobile Offshore Base featuring an artificial beach for hovercraft, a camp for POWs and room for 3500 vehicles, 150 aircraft and 3000 troops, 1996



The Jidong Development Group is proposing to build floating Chinese sea bases up to 2 kilometers long for tourism, shipping, power generation and offshore fossil fuel extraction. The designs are modular, assembled from semi-submersible hull sections.

Smaller island: 300 meters long and 90 meters wide, 0.4 million tons

Medium sized island: 600 meters long and 120 meters wide, 1 million tons

Larger island: 900 meters long and 120 meters wide, 1,5 million tons

The islands will travel at speeds of up to 16 kilometers an hour.

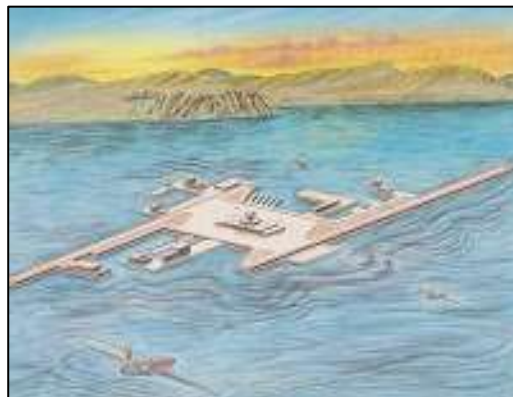
Artists' sketches of then proposed floating island



The presence of a People's Liberation Army officer at the April 2015 Jidong Development Group press conference, however, suggests that China's interest in the floating base may more than commercial.



Officials of the firm Float, Inc. suggest that the technology they are developing for the U.S. Navy could also be used for a platform large enough to accommodate two 12,000-foot civilian runways three miles off San Diego.



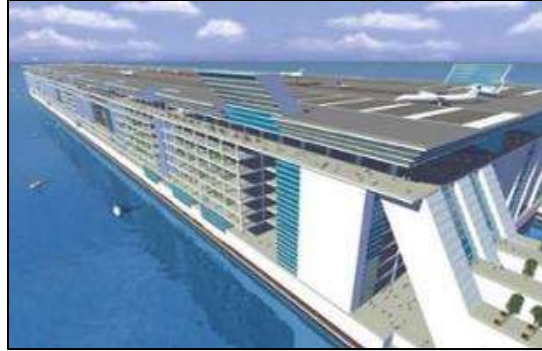
Floatport, as it has been tentatively named, would ride on 30,000 hollow concrete cylinders, each 40 feet long, 20 feet in diameter, and weighing between 90 and 100 tons. The cylinders, capped at the top, but open on the bottom like overturned buckets would be grouped with manifolds permitting air to flow back and forth; when wave motion compressed the air in one cylinders, it could bleed to another, a shock-absorber against the force of rough seas.

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The Floatport design was rejected in 2003 due to projected \$1.5 billion cost, access, the difficulty in transporting jet fuel and utilities to the structure, security concerns, inadequate room for high-speed exits and taxiways and environmental impact.

The open-bottomed floating box concept remains attractive to some, however. Jan van Kessel's conceptual "Freedom Ship" would be 1.5 kilometers long, 250 meters wide and more than 100 meters high, a bottomless box, floating on a cushion of encapsulated air. Van Kessel computes that the forces would be about half of those on a conventional closed barge.



"Design Concept -- Floating City" (1961) by Kisho Kurokawa conceives of lake-surface housing as part of the development of Narita International Airport.

Roof-top motorways and walks interconnect the modular structures, each of which has its own harbor. A spiral escalator provides vertical transportation between rooftop and water transport.



"Airports at Sea," Time, May 39, 1969, a floating airport proposed by Architects Charles Gallichio and Jan Dabrowski,

As Flight 452 from Paris circles New York International Airport, passengers look down to see a grid of runways six miles long floating in the open Atlantic 35 miles seaward of Sandy Hook. Wind speed at sea level is 40 m.p.h. and the swells are 6 ft. high, but inside a protective barrier of huge plastic bags the water surrounding the airport is calm. An immense pipe, dropping into the ocean from one end of the airport, is actually a pneumatic subway tube carrying passengers and freight to shore.

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The potential of a floating "Thames Hub" or an offshore "London Britannia Airport" has surfaced in British thoughts. A few artistic renditions,



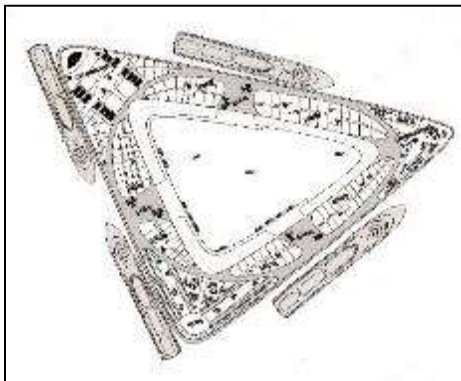
As proposed by the design firm Gensler,

Because this airport is floating it could be positioned in an optimal location after you evaluate flight paths, bird migrations and all the rest of the issues in the estuary. There's a lot of flexibility.

London's proposed Delta airport is intended for pilotless planes which take off vertically.



And perhaps there's still a future for a mid-ocean seaplane base. Below, a floating "Cruise Terminal," conceived by Waterstudio, NL.



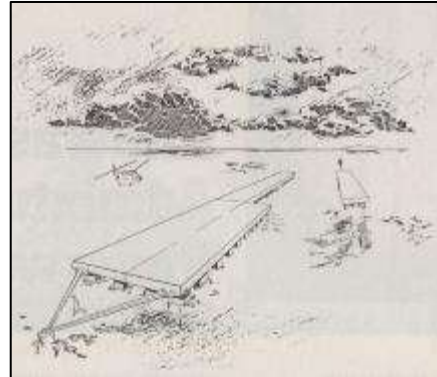
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Design of floating aviation structures has elicited a number of technical papers. We'll mention just a few.

"Floating Airports," Concrete International 9.5 (1987) by Eberhard Lemke and "Two Futuristic Concrete Floating Structures," Structural Engineering International 3.3 (1993) by Philip Chow discuss issues related to concrete as a suitable material.

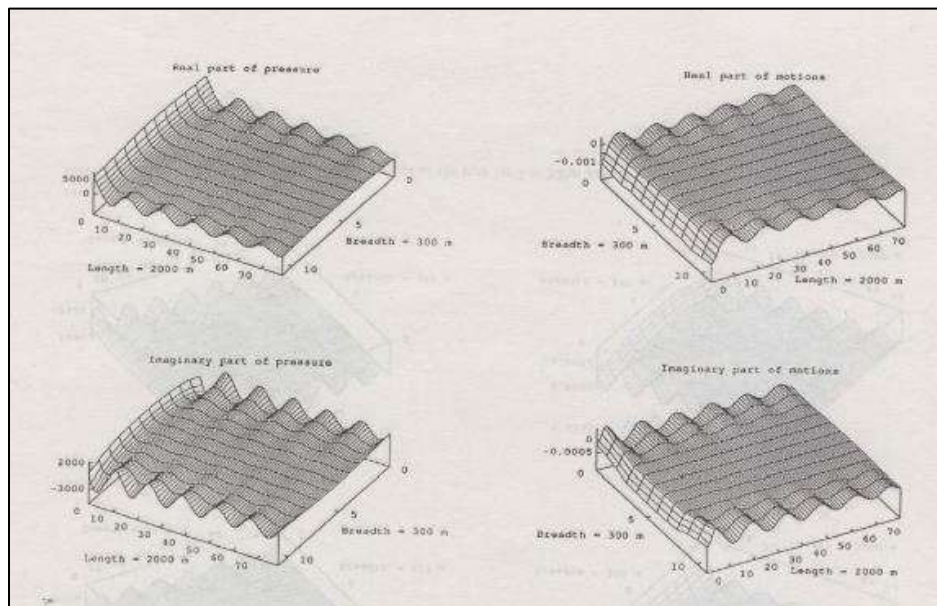
"Floating Airports," Concrete International 9:5 (1987) by Lemke provides a few guidelines for design.

Operating condition	
Wave height	7.0 m
Wave period	9.7 seconds
Survival condition	
Wave height	13.2 m
Wave period	16.2 seconds
Length of structure	up to 3000 m
Width of structure	up to 150 m
Life expectancy	up to 50 years
Flight deck loading (uniform)	0.1 ton/m ²
Industrial loading	1.2 tons/m ²
Headwind	65 km/h
Crosswind	15 km/h
Beam currents	3.7 km/h
Single Point Mooring system	50 to 200 m
water depth	



A conceptual drawing. The structure would be assembled by sections in protected waters.

"The Motions Performance of a Mat-Like Floating Airport" by Parthasarathy Mamidipudi and William Webster in Hydroelasticity in Marine Technology: Proceedings of the International Conference on Hydroelasticity in Marine Technology (1994), O. Faltinsen, C.M. Larsen and T. Moan, Eds., graphically illustrates how wave forces might be distributed under a floating airfield..

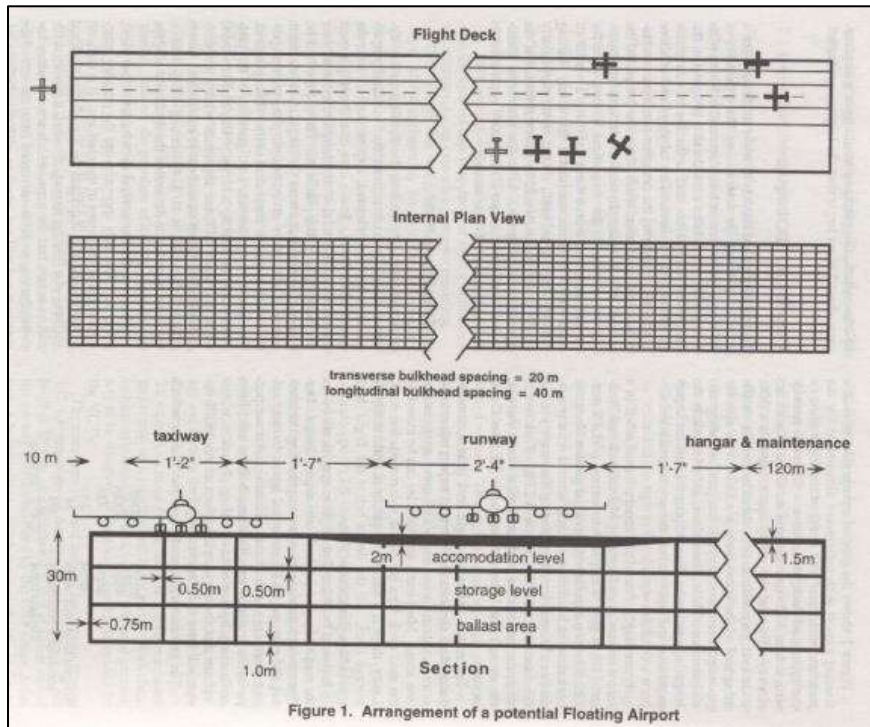


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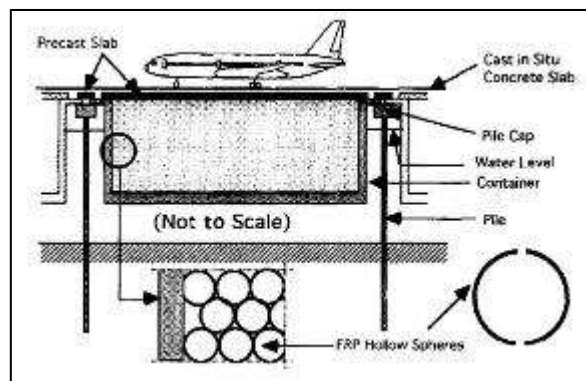
"A Preliminary to the Design of a Hydroelastic Model of a Floating Airport," by Seok-Won Lee and William Webster, in the same volume, provide additional information.

In completed form, the VLFS [Very Large Floating Structure] is essentially a mat-like pre-stressed concrete structure that is segmentally constructed. Like the semisubmersible design, this concept will be constructed in modules, but in far fewer numbers. In contrast, the modules will be rigidly connected together in protected waters.

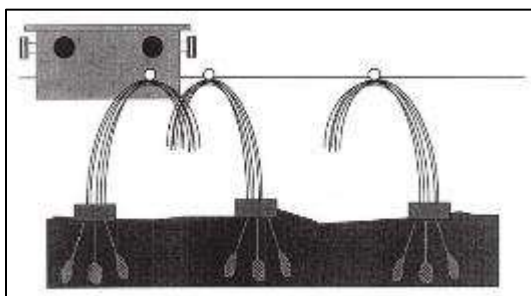
The minimum required runway length of a Boeing 747-400 passenger jet during normal conditions at sea level is 3500 m. An additional 305 m at either end of the runway is recommended by the U.S. Federal Aviation Administration. With the possibility of future passenger aircraft that require longer runway lengths, a 4000 m long runway should be adequate.



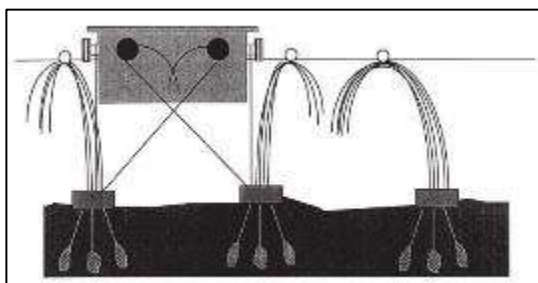
Hartono Wibisono's "An Alternative Structural System for an Offshore Airport," *Ocean Engineering* 23.6 (1996) and "A Floating Tied System for an Offshore Airport," *Ocean Engineering* 25.7 (1997) utilizes precast boxes filled with hollow spheres sitting on a pile system. A slab of precast and cast-in-situ reinforced concrete makes the entity monolithic. The box and slab system equilibrates the difference between the gravity, uplift and lateral forces to the piles.



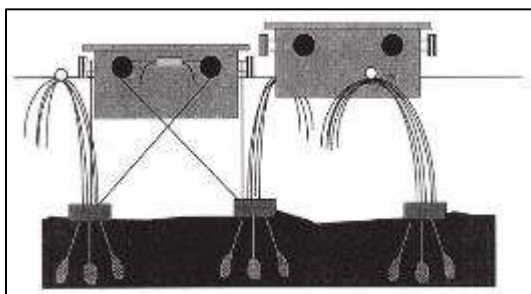
Cables prevent the boxes from oscillating or laterally moving during construction and operation.



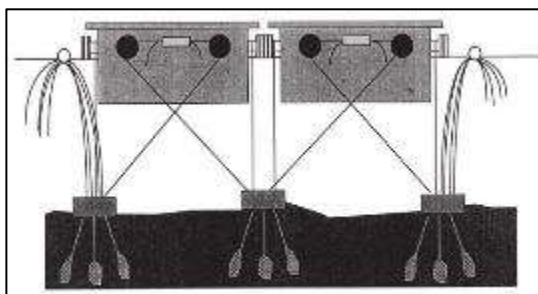
Towing first box



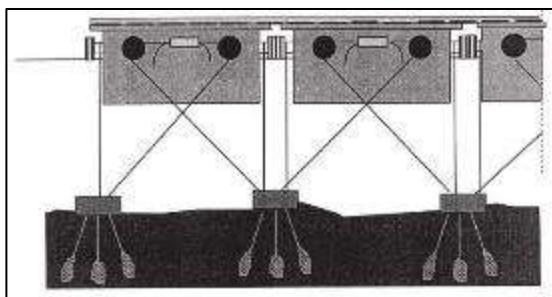
Tying first box



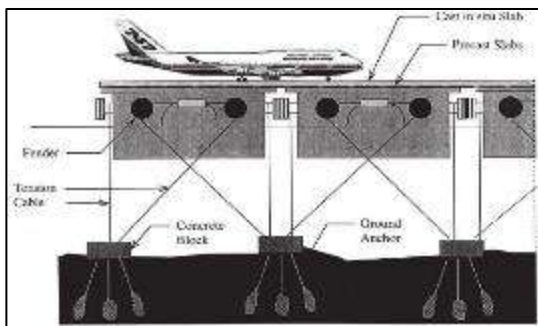
Towing adjacent box



Tying adjacent box



Constructing precast and cast in situ slabs



Armstrong and the others of the 1920s had little idea of the technical complexities inherent in the design, construction and operation of a floating airfield, but indeed they had the dream. Such a floating island may or may not ever be constructed, but if not, we still deem it still a splendid idea.

We've focused on constructed landing strips, but mustn't ignore floating islands elsewhere by nature. From M.G. Berrie's wartime diary, Dutch New Guinea: Party O, the March 22, 1944 entry set in an uncharted swamp 70 miles south of what's now Jayapura, Indonesia. The "Cat" would have been a Catalina, a twin-engine high-winged amphibious monoplane.



There was an abundance of islands of all sizes, some only a few yards square and only a few feet apart, and they were mostly covered with grass and small shrubby trees. The water looked to be fairly shallow and we thought we may be able to hop and wade from island to island to the shore and, with that idea in mind, Bob picked one of the larger islands and jumped from the

blister of the Cat, fully laden, pack and all, expecting to land on firm ground. But, to his dismay, he met with very little resistance, to his not inconsiderable weight, and quickly sank to his shoulders and was in danger of disappearing altogether but luckily was close enough to be quickly dragged back into the aircraft along with many gallons of water and grass! This, our first setback, was one of many more to come, and certainly something we had not been led to expect!

It soon became apparent that, although the islands looked solid and substantial, appearances were very deceptive for they proved to be nothing but matted grass and small trees growing on top of the water and were light enough to be moved around aimlessly by every little wind shift.

The grass had a rather large hollow stem and resembled the papyrus reed that grew in the Nile River in Egypt. The portion above water was quite dried out and it extended below the waterline to the roots for a couple of feet and was particularly buoyant. When pushed below the surface it bobbed up immediately. They were similar to floating islands we had encountered, during the previous operation, in the Sepik River area, though somewhat smaller.

A number of other islands were tried, very carefully this time, but without success, and by doing so we made our next problem. The draft from the Cat's propellers caused many of the smaller islands to close up round the aircraft effectively blocking further movement! Try as he might the pilot couldn't get the aircraft free. His evasive tactics only served to pack the islands in more closely!

Lt. Bruin, not to mention the rest of us, was becoming increasingly worried that the aircraft could be permanently trapped if he continued and as a last resort the engines were shut down in the hope the islands would float away. But of course they didn't!

The logged location and date suggest that the landing was on the Sepik River or one of its tributaries, where floating islands of up to 100 meters in diameter with living trees on them are seen in the monsoon season.

Naven, A Survey of the Problems Suggested by a Composite Picture of the Culture of a New Guinea Tribe Drawn from Three Points of View (1958), by Gregory Bateson, describes a funeral ceremony in the region, but not the funeral of the Cat crew.



The spectacle represents the voyage of the ghost, on a drifting patch of floating grass, down the Sepik River to the land of the dead.

The Future.

Sea Launch, a non-governmental spacecraft launch service. Zenit 3SL rockets are positioned on the self-propelled Ocean Odyssey platform and moved to the equatorial Pacific Ocean for launch.



CHAPTER 58

INDUSTRIALIZE

We familiarized ourselves in Chapter 36 with the harvesting of fish and, to a lesser degree, of agricultural produce. This chapter considers the industrial processing of materials. Operations associated with the energy sector merit their own chapter, Chapter 71.

Thoughts regarding industrialized floating islands are not new, two of the most-known floating islands being Swift's Laputa (Chapter 81) and Verne's Propeller island (Chapter 12).

Laputa -- a sky island, admittedly, but we'll consider it -- is equipped with instruments of astronomy, but neither they, nor any other of the island's goods, for that matter, seem to be locally produced.

Their houses are very ill built, the walls bevil, without one right angle in any apartment; and this defect arises from the contempt they bear to practical geometry, which they despise as vulgar and mechanic; those instructions they give being too refined for the intellects of their workmen, which occasions perpetual mistakes. And although they are dexterous enough upon a piece of paper, in the management of the rule, the pencil, and the divider, yet in the common actions and behaviour of life, I have not seen a more clumsy, awkward, and unhandy people, nor so slow and perplexed in their conceptions upon all other subjects, except those of mathematics and music... Imagination, fancy, and invention, they are wholly strangers to, nor have any words in their language, by which those ideas can be expressed; the whole compass of their thoughts and mind being shut up within the two forementioned sciences.

The absurdity of the Lapitian attempt to extract sunshine from cucumbers says it all.

While Verne's floating island of capitalistic wealth is resplendent in 1895 modernity, its economy does not derive from creation of value, but from fortunes garnered elsewhere. Propeller Island imports oil for its power, the many goods to which the wealthy are accustomed and even daily newspapers to occupy the inhabitants' leisure. Political strife ensues, however, as at least some of the citizens desire -- as capitalists are prone to do -- to increase their income.

One important difference between the two factions concerned the future of Standard Island. While the Starboard side had embarked on it only to enjoy their wealth in peace, the Larboard side were already beginning to regret the lack of business interests. They asked why this island should not be used as an immense merchant vessel, to carry cargoes across the Pacific, why industry was so completely debarred from it.

Two floating islands is an admittedly-small sample, but we'd not drastically change our finding were we were to pursue all the fictional literature. When one invents a floating island setting, industry seems to fall by the wayside. It too often clutters up the story.

But that, of course, is about fantasy. Let us look at some cases more factual.

Fish Packing



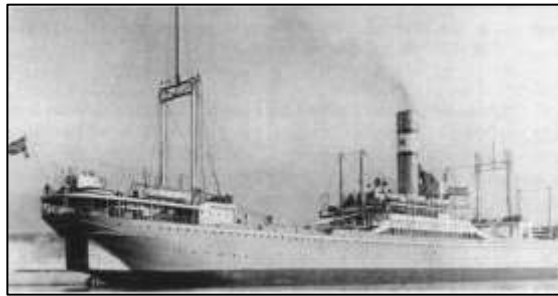
Carlisle Packing Co., Yukon River, c. 1918



62 meter Bulgarian "Floating Factory," 1985

Blubber Rendering

"Factory Ships," an innocuous name for whale-butchering vessels"



The 17,800-ton Kosmos, built in 1929



The 8,000-ton MV Nisshin Maru, the world's remaining factory ship, a re-fuelling vessel and hunter vessel alongside

Mechanical Facility

"The Volcano Steam-Sloop Fitted as a Floating Factory for the Baltic," Illustrated London News, August 5, 1854 p 106

HMS Volcano was a wooden paddle sloop launched in 1836. She became a floating factory in 1862 and was broken up in 1894.

Displacement: 1006 tons, 140 horsepower, Copper boilers



Boat Mills

A boat mill is an undershot waterwheel and milling house built on a floating platform, moored to the river bank or anchored in the stream. The flowing water turns the water wheel, which in its turn drives the milling machinery. As the structure floats at a constant elevation above the water, the wheel maintains its optimum position.

Boat mills were typically 10 to 15 meters long and 5 to 8 meters wide. Some were two or even three stories tall. The wheel turned at 3 to 5 revolutions per minute, delivering between 3 and 5 horsepower at the shaft. While the efficiency was only half that of that of an overshot wheel, the boat mill could be relocated for market advantage or simply better positioning in the current.



Boat mills were used on the Tiber to grind grain during the 6th century and by the 12th century were employed over much of Europe. By the 15th century, boat mills were used for corn grinding, paper production, sawing, fulling (cloth preparation), oil pressing, polishing, minting and cotton spinning.

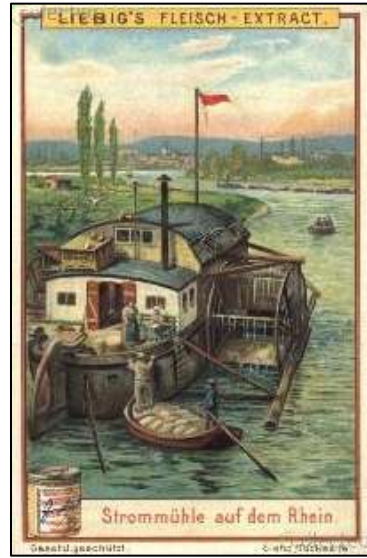
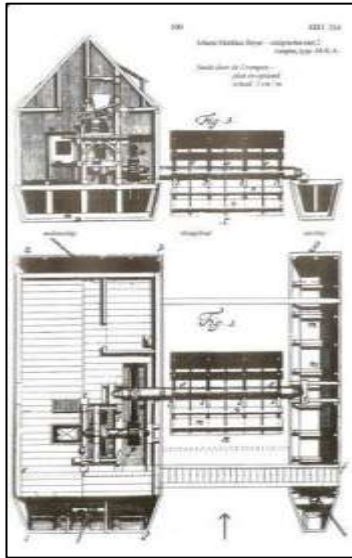
Toulouse had some 60 such mills on the Garonne; Paris, 70 to 80 on 1-mile of the Seine in the 1300s. There were 17 floating mills on the Rhone at Lyons in 1493, growing to 20 by 1516 and to 27 by 1817. The Elbe once boasted 500. There were hundreds on the Danube, 62 in Vienna, 88 in Budapest, and over 90 on the Mur.

Three boat mills in Jean van Eyck's "Virgin with Chancellor Rolin," 1435



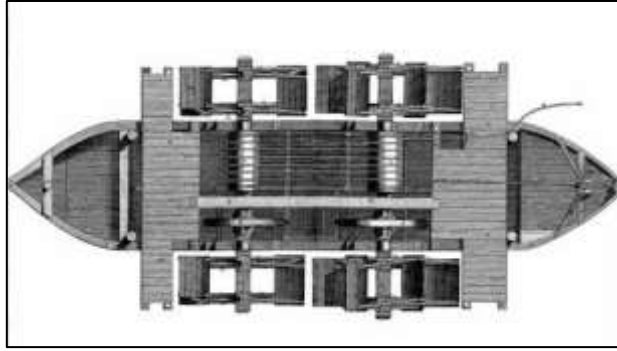
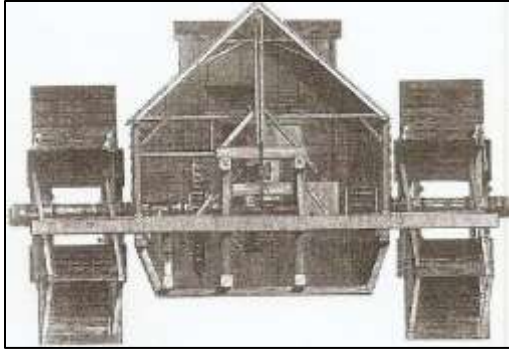
Three types of boat mills, in order of power production:

1. Single side-mounted wheel.



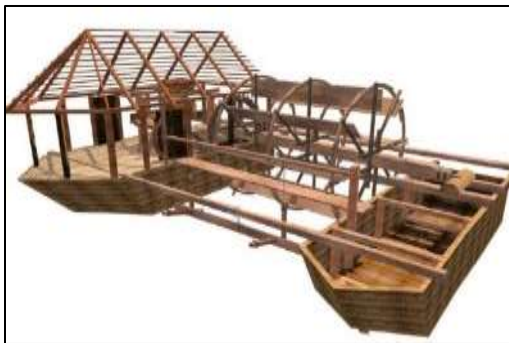
2. Single hull with one or more wheels on either side.





3. Twin hulls with a wheel between, in essence, a catamaran.

A twin-hulled mill could stably support a wheel up to 6 meters wide. A control gate could regulate water velocity and protect the wheel against debris.



Boat mills began to fade in the 1800s. Bosnia had 27 boat mills in 1950, the last one disappearing in 1966. Of the 35 mills still in use in Romania in 1957, 8 remained in 1968.

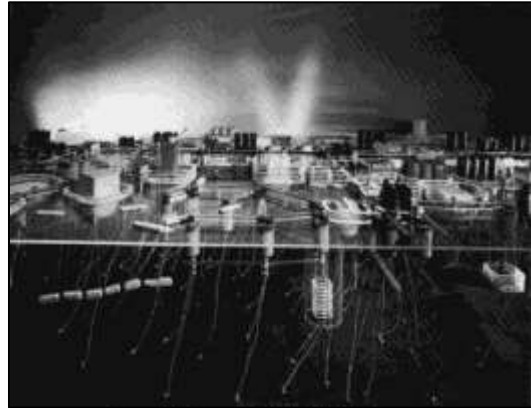


Last boat mill on the Rhine, 1925

The Future

While futuristic architects of Chapter 70 are prone to designate industrial sectors in their islands of conception, we note the resounding lack of industrial engineering collaboration.

Kisho Kurokawa does not reveal what is being manufactured in "Floating Factory," 1969, but art elicits thoughts, not supplies details. What is clear is that in the artist's mind, the future holds floating platforms of industry.



Conclusion

When all is said and done, however, this is a short chapter, not a strong case for floating factories. Pack some fish, boil some blubber, grind some grain -- all market-driven endeavors for a time -- but none of which has lasted.

Perhaps the industrial-shy floating island fictions not that inaccurate. In planning a floating island, don't stake much on the industrial contribution.

CHAPTER 59

SAVE THE ENVIRONMENT

In Insulis Natantibus (1711), George Munz proposed constructing an artificial island on Lake Duzent-Teich, near Nüremberg, of buoyant Friesland peat and planted with vegetation.

With rushes, vines, and other similar bonds... If all these things are carefully arranged... I see no reason why art could not create a floating islands as good as nature makes.

And since then, creation of an artificial floating island "as good as nature makes" has been a recurring inspiration.

A helophyte is a plant that grows partly submerged in water and rejuvenated from buds below the surface. The role of helophytes in water pollution control is well known. They uptake such nutrients such as phosphorus and nitrogen through their submerged root. They and their associated community metabolically degrade organic matter and volatile organic compounds. Their root structure bio-filters particulates that might otherwise remain in suspension. Biofilm microbes within the matrix uptake heavy metals precipitates.

Wetland preservation is thus an effective natural means of pollution control, but where natural marshes have yielded to human activity, artificial floating islands of appropriate helophytes are increasingly employed.

Such an island is known as a "floating treatment wetland," an "FTW" for short.



FTWs employ rooted, emergent macrophytes growing as mat floating on the water surface. Invertebrates such as insects, insect larvae, crayfish, and mollusks, as well as protozoans, bacteria, and algae all contribute to this floating ecosystem as decomposers, predators and other participants in the food chain.

As the plants acquire their nutrition directly from the water column, their potential rate of nutrient uptake is high. Solids and biofilm accumulating within the matrix is constantly being eaten by fish and other life forms. Heavier matter tends to slough off into the sediment below.

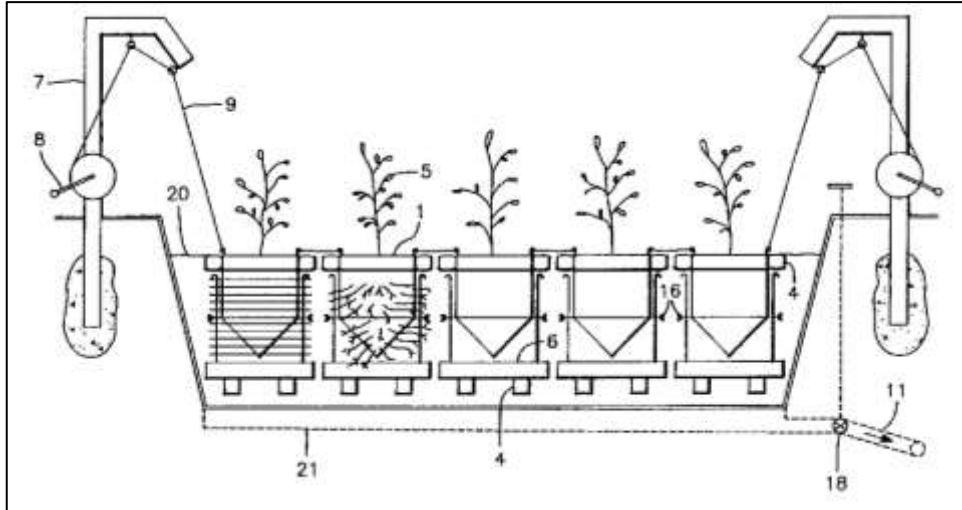
FTWs can tolerate fluctuations in water depths, can be augmented, retired or repositioned to meet demand and in blend into the visual appearance of the waterbody. FTWs rely on no addition of chemical products and can be designed to utilize native species.

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Framework and Matrix

By "framework," we mean the structure that holds an FTW together. By "matrix," we mean the media in which the vegetation is bedded.

Some FTW have framework constructed independently of the rest of the structure. "Treatment of Polluted Water Using Wetland Plants in a Floating Habitat," Patent 5,337,516 (1994) by John Hondulas, for example, illustrates a liftable container into which planted modules can be placed.

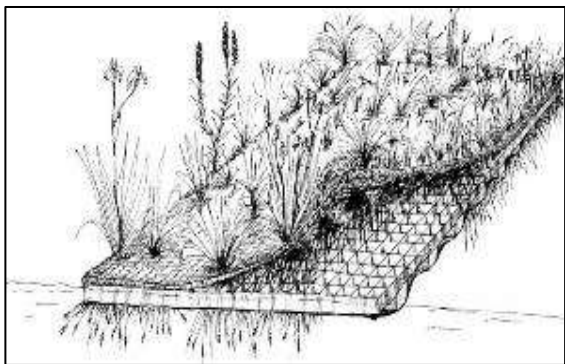


Simpler stand-alone frameworks employ PVC pipe or bamboo without the lifting apparatus. Buoyancy in such systems is generally achieved through the use of sealed pipes or drums or polystyrene foam pontoons, all of which unsubmerged, may be vulnerable to ultraviolet light degradation.

Below, a commercial design consists of 2-meter equilateral triangles constructed from polyethylene, polyurethane or neoprene piping. Floating plastic netting spans between the sides and cables the connect islands, one to another



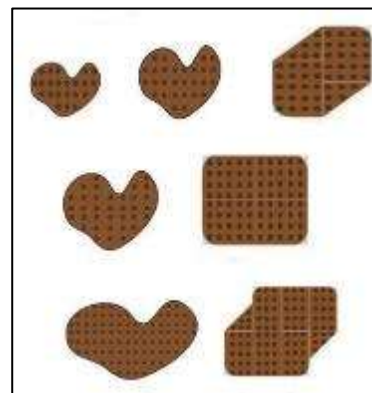
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Most FTW designs combine structural and matrix functions, one being a cellular structure, not that different from the trays of nursery plantings,

Tsuchiura Port, Lake Kasumigaura. The 91 x 9-meter floating island installed in 1993 consists of 40 segments made of steel frame with polystyrene. Sponge with 10-centimeter cuts for rooting fills the frame supports.

Below are integrated designs, the one on the right widely marketed by BioHaven Environmental Solutions with a polyester-based, nonwoven, filter-like material, typically 8 inches thick, bonded with polyurethane marine foam. The units illustrated range from 28 square feet to 403 square feet, with pre-formed holes for seedlings.



Organic matter is placed on top of the island before plants are seated. Coconut fiber or peat is often used as planting medium. As the roots descend into the flowing water below and debris and decomposing matter accumulate in the top layers, the matrix will evolve into a more complex system.

Buoyancy

The physics of buoyancy was pursued in Chapter 19. Here we will note aspects particular to FTWs.

A FTW's freshly-planted weight can be about one-third more than its dry weight and can double over the course of a single growing season. Island thickness, however, only expands slightly. An island located in Shepherd, Montana, for example, has grown about 9 centimeters over an 8-year period. While off-gassing within the matrix contributes to buoyancy, such gasses don't over-ride an ongoing densification.

BioHaven floating islands have a standard buoyancy of 5.5 pound/cubic foot, as the standard matrix is only 8 inches thick, not all of which is submerged, the company recommends that design be limited to about 2 pounds of additional loading/square foot. Thus BioHaven's warning,

DO NOT Walk on the BioHaven Floating Island

Should a walk-about be desired (Chapter 37), buoyancy can be increased by the addition of pontoons.

Helophytes

Common genera of marsh plants (emergent aquatic macrophytes):

Phragmites, Typha, Phalaris, Glyceria, Cyperus, Eichhornia and others with air filled aerenchyma tissues.

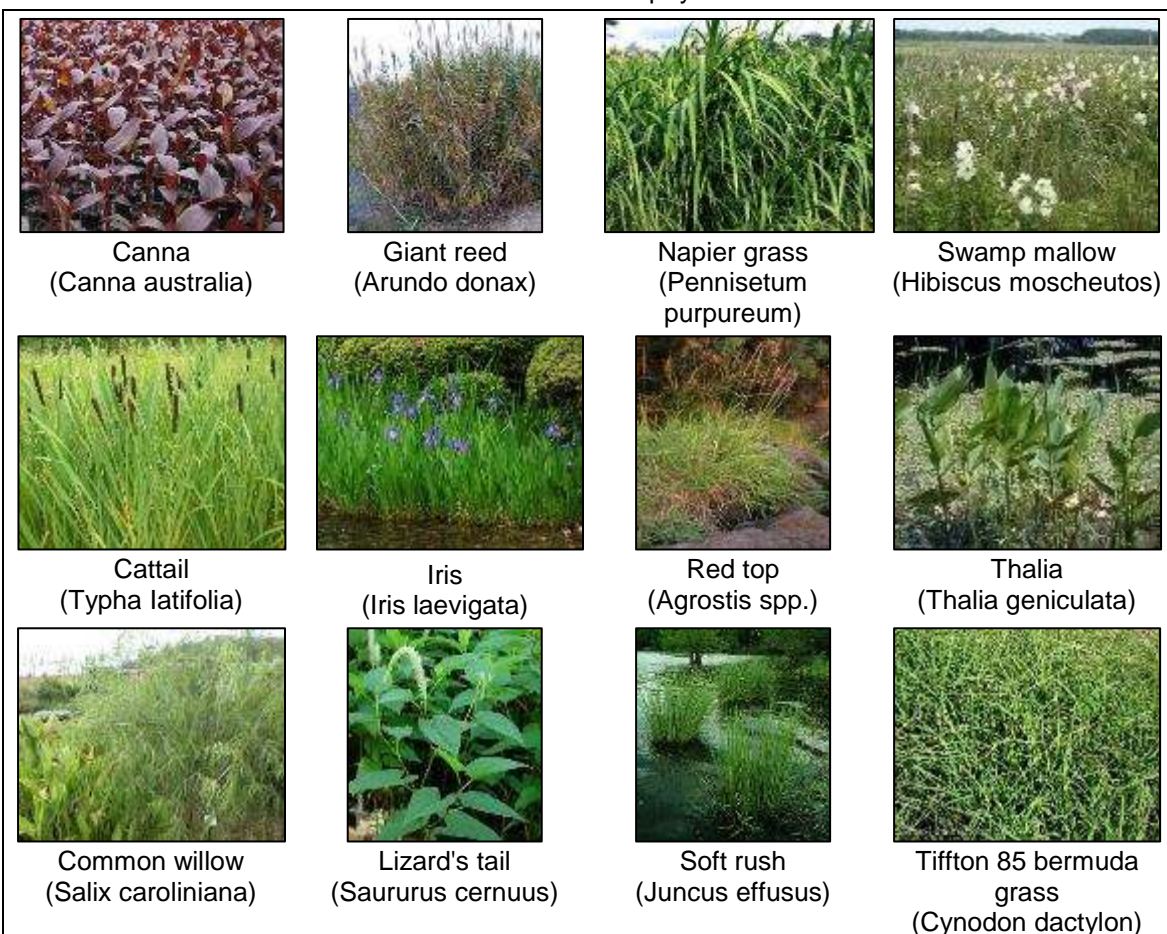
Under moderate climatic conditions:

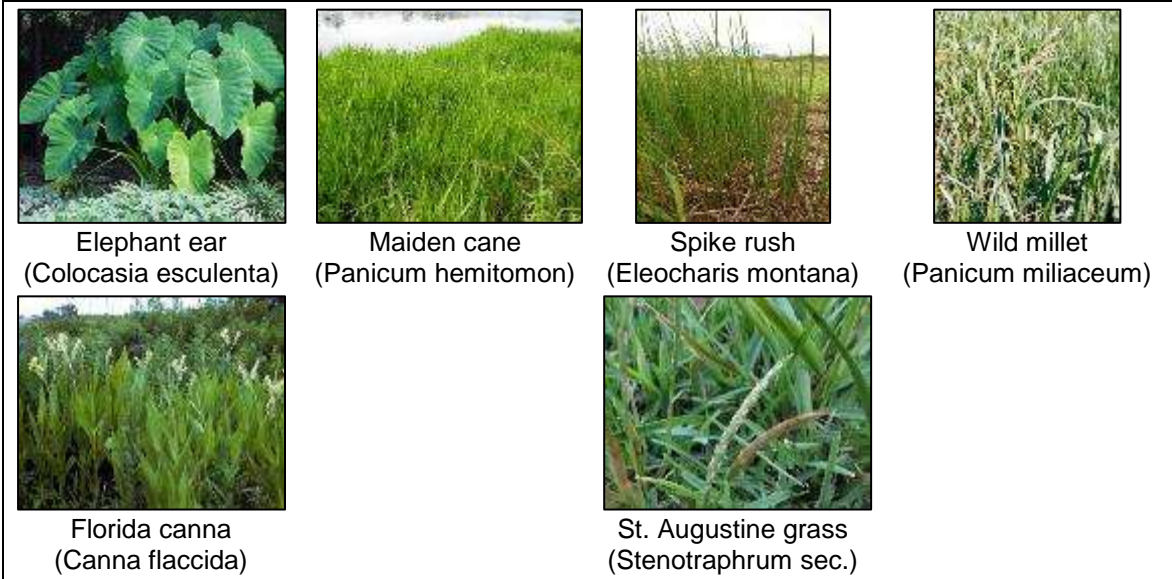
Lythrum, Carex, Juncus, Iris, Scirpus, Mimulus, Caltha and Glyceria

In tropical regions:

Persicaria, Neptunia, Ipomoea, Limnocharis, Hydrocotyle, Cyperus, and Colocasia

A Few FTP Helophytes





Planting



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Herbivores such as muskrats, coypu and nutria may need to be discouraged by the application of wire mesh until vegetation is established.



Even trees are occasionally included in FTWs.



Roots

The rhizosphere -- which may extend downward a meter or more -- takes up aquatic nutrients and provide surfaces for active biofilms. As the roots are FTWs' raison d'être, they merit our special attention.

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The lower right, seawater biota on the underside of a marine FTW.

Propagation

It requires about two years in meso and eutrophic environments for vegetation to begin to spill over the edges



1 month after planting



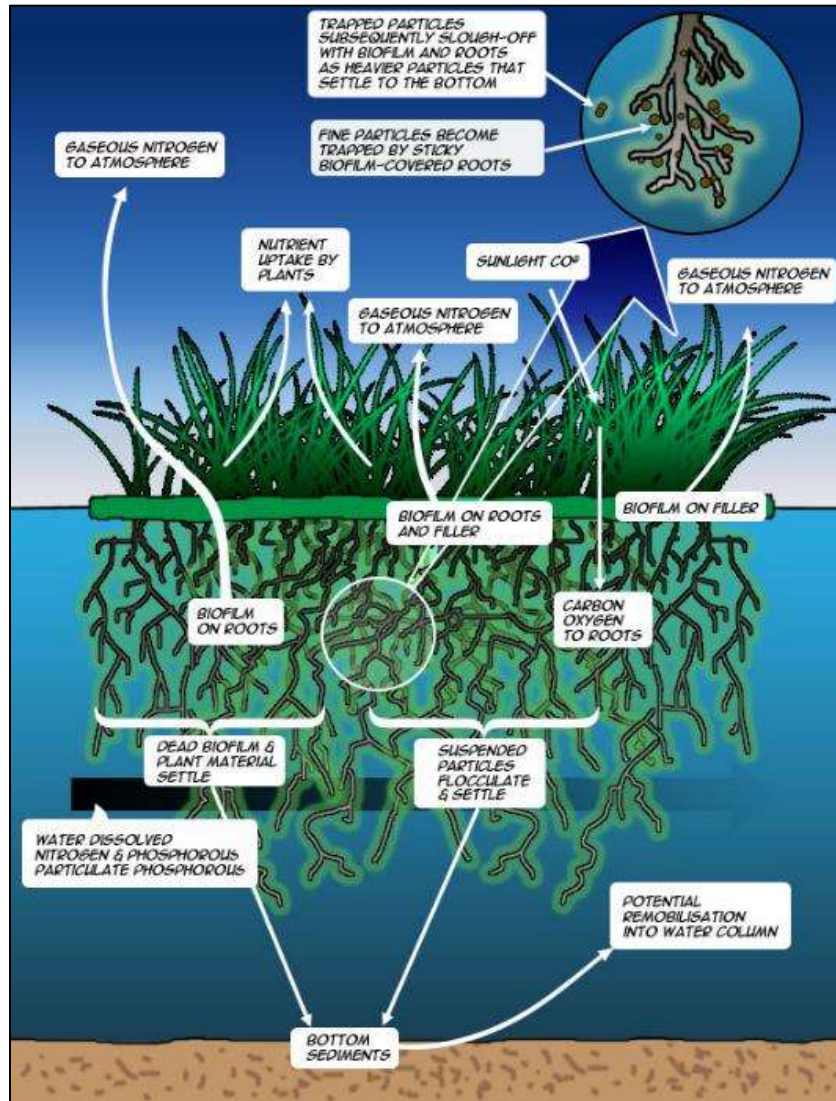
1 year after planting



Undated comparison

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Pollutant Removal



The pollutant-removal efficacy of a FTW can be high, as suggested by Frank Stewart, Tim Mulholland, Alfred Cunningham, Bruce Kania and Mark Osterlund in "Floating Islands as an Alternative to Constructed Wetlands for Treatment of Excess Nutrients from Agricultural and Municipal Wastes – Results Of Laboratory-Scale Tests," *Land Contamination & Reclamation* 16:1, 2008.

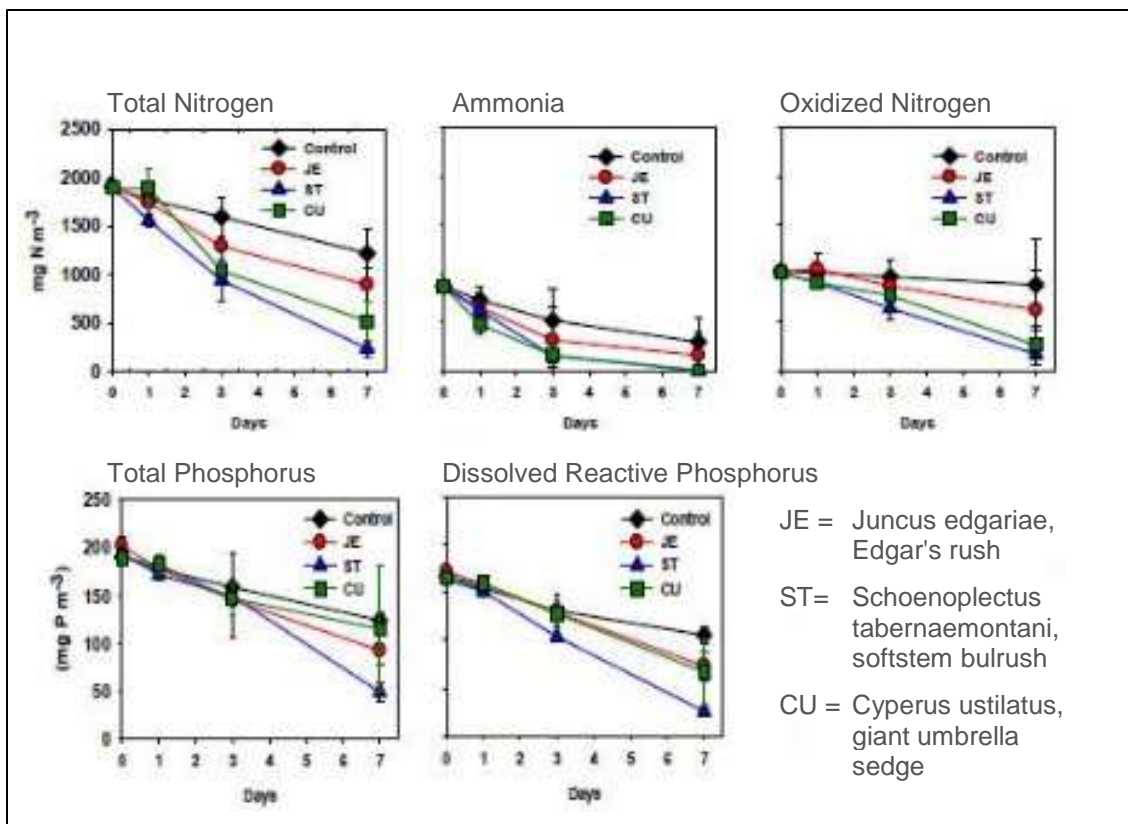
	Removal Rate (mg/day/square foot)	Source	Notes
NO ₃ -N	10,600	BioHaven Floating Islands	Microbes only. Carbon source added. 27°C

	520	J. Boutwell and J. Hutchings, <u>Nutrient Uptake Research Using Vegetated Floating Platforms, Las Vegas Wash Delta, Lake Mead National Recreation Area, Lake Mead, Nevada</u> , U.S.BR Technical Memorandum 8220-99-03 (1999)	Macrophytes, microbes and algae
Total N	540	B. Hart, R. Cody and P. Truong, "Hydroponic Vetiver Treatment of Post Septic Tank Effluent," <u>Proceedings, Third International Conference on Vetiver</u> (2003)	Vetiver grass on floating platforms. Microbes and macrophytes.
NH ₄ -N	273	BioHaven Floating Islands	Microbes only. Aerated. 27°C.
Total N	270	C.C. Tanner, "Plants for Constructed Wetland Treatment Systems -- A Comparison of the Growth and Nutrient Uptake of Eight Emergent Species," <u>Ecological Engineering</u> 7 (1996)	Total removal (plants, microbes and absorption). Wastewater
	255	R.K. Hubbard, G.J. Gascho and G.L. Newton, "Use of Floating Vegetation to Remove Nutrients from Swine Lagoon Wastewater," <u>Transactions of the ASCE</u> , 47:6 (2004)	Macrophyte uptake only. Assumes 180-day annual growth period
PO ₄ -P	428	BioHaven Floating Islands	Microbes only. Aerated
	52	Hart (2003)	see above
	40	Tanner (1996)	see above
	38	Hubbard (2004)	see above

For FTW design, however, such successes must be viewed with a degree of skepticism, as the vagrancies nature are largely eliminated. As can be inferred by some of the notes, the table is largely reports highly-controlled tank tests. As environmental processes tend to interact, one with another, biodegradation of one constituent can be significantly influenced by any number of other bioactivities. Field performance can be in the order of one-tenth as high.

FTW design can be substantially improved by field trials under natural conditions over an extended period.

The plots below of N and P reduction in batch-loaded tanks with planted FTWs are taken from Chris Tanner, James Sukias, Jason Park, Charlotte Yates and Tom Headley, "Floating Treatment Wetlands: A New Tool for Nutrient Management in Lakes and Waterways," (2005)



Unlike laboratory results, however, few pollutants in natural waterbodies substantially degrade in just a matter of days. What is more informative is the difference due to vegetative species. For a particular waterbody, field trials are warranted.

As decaying matter will release the substances back into the environment, periodic harvesting may be required to remove pollutants from the nutrient cycle.

FTW Examples

From "Wetland Moored Ready for Big Launch" [Rotorua Daily Post](http://www.rotorua.govt.nz/rotorua-daily-post), August 21, 2012,

World's largest floating wetland sewn with 20,000 native plants will remove 4 tons of nitrogen and 1000 kg of phosphorus annually from Lake Rotorua in New Zealand.

The environmental initiative on Lake Rotorua is believed to be the world's largest man-made floating wetland and contains more than 20,000 hand-sewn native plants grown from Rotorua-sourced seeds.



It is estimated the floating island will remove up to four tons of nitrogen and more than 1000 kg of phosphorus from the lake every year. As well as helping improve Lake Rotorua's water

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quality, the wetland will also promote the district as it has been constructed to spell out the word "Rotorua" in giant floating letters.

The 5000-square-meter structure is 160 m long by 40 m wide and a fiber mat covering its surface is constructed from half a million recycled plastic soft drink bottles.



Heathrow Airport. 6,000 square meters of FTW



Mohave, California



Robina Lakes, Queensland



Oberg, Germany



Wayne, Pennsylvania



Agricultural drainage, New Zealand



Barrington, Illinois



Warwickshire, UK

Jordan Lake and Falls Lake, North Carolina, FTW's 23-square meters in area, 25 centimeters thick, constructed of extruded plastic injected with closed-cell foam. Pre-drilled holes 20 centimeters on center and 13 centimeters deep, half-filled with peat moss planted with a mixture of tussock sedge, soft rush, prairie cordgrass, Japanese sweet flag, pickerelweed, arrow arum, big bluestem, and marsh hibiscus.



"Floating Wetlands Hit Lake," Las Vegas Review-Journal, November 18, 2000 reports on FTWs installed in Lake Mead

The federal government this week launched an effort to deploy Mother Nature in the ongoing battle to curb pollution entering Lake Mead. Bureau of Reclamation botanist John Boutwell supervised the installation of a pair of docklike structures anchored in Las Vegas Bay, where a system of floating wetlands - two man-made islands for growing reeds, bulrushes and cattails - will glean nutrients, remnants of lawn fertilizers and possibly some heavy metals

Floating Island Construction and Placement in Las Vegas Bay, Lake Mead, Nevada (2001) USBR Technical Memorandum 8220-01-16 by John Boutwell describes materials and techniques. Vegetation included southern cattails, five species of bulrush and creeping spikerush. Cattails were more successful than bulrush.

Water Quality and Plant Growth Evaluations of the Floating Islands in Las Vegas Bay, Lake Mead, Nevada (2002) USBR Technical Memorandum. 8220-03-09, also by Boutwell, concludes that the project yielded some environmental benefit, but the engineering was difficult.

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Lake Mead before planting



A year later

Dutchy Lake, Oregon. Below left, a 20,000 square foot FTW covered with 6 inches of crushed rock. Below right, partially submerged after rainfall



Sydney Olympic Park, Australia



Fish Fry Lake, Montana

Nitrate-N:

0.55 → 0.01 mg/L

Phosphate-P:

.041 → 0.025 mg/L

Water clarity:

14 inches → 19 feet

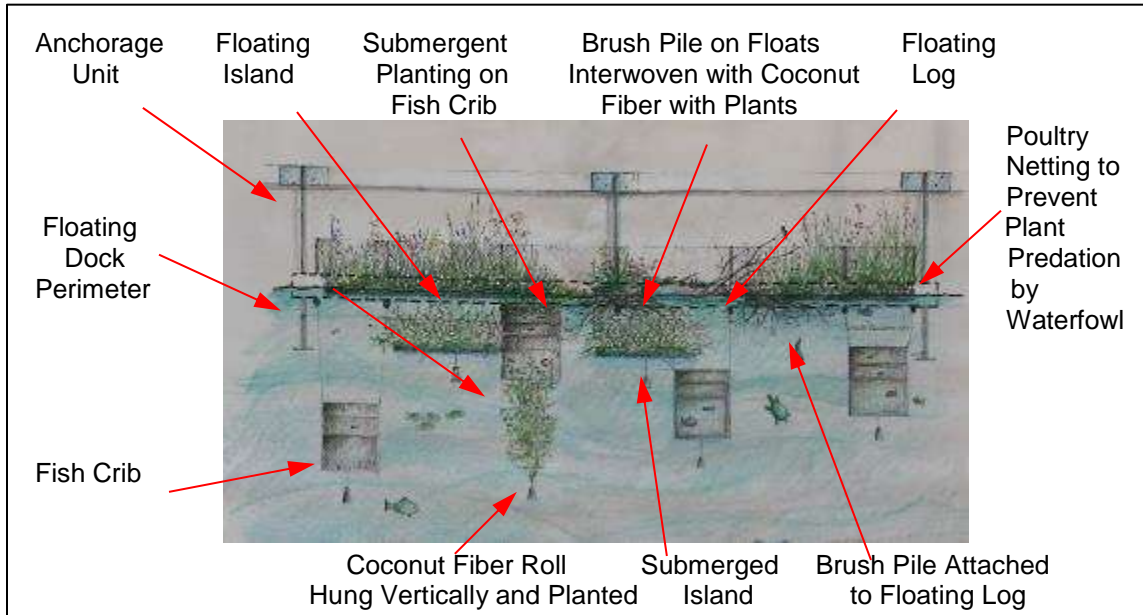


Fish and Fowl

Naturalistic artificial islands serving purposes other than that of water quality treatment are not FTWs, but in can provide habitat for waterfowl, mammals, reptiles, amphibians and smaller invertebrates. Fish spawn within the rhizosphere and rest in the shade beneath. Fry seek safety among the trailing roots.

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Fish Hotel, Chicago Riverwalk



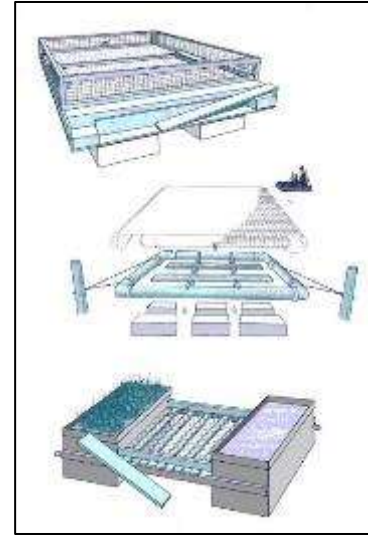
Bass habitat, Elephant Butte Reservoir, New Mexico

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Floating islands deployed for waterfowl habitat.



Above, terns at Portmore Lough Nature Reserve, Northern Ireland



Right, three tern-friendly designs.



A 4100 square meter floating breeding refuge for Caspian terns, Sheepy Lake, California



Habitat for the California Clapper Rail, a chicken-sized bird that rarely flies, Arrowhead Marsh, California,

Posters for a conference on phytoremediation techniques in the coastal pozón Monte Sierra Parayas, Cantabria, Spain, 2014



Shore Protection



A marine FTW that withstood a 5-foot tidal surge suggest a possibility for shore protection



A smaller FTW under test as a means of bank stabilization.

Lifting an intervening floating structure indeed expends a portion of a wave's erosive energy, but not likely in a cost-effective manner. wave-quelling rafts have lives measured in years -- 10 is suggested for BioHavens, but not guaranteed -- and require regular repair. Earth-rooted vegetation and/or riprap, on the other hand, have life spans of decades, better withstand wave attack and are largely maintenance free.

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Artificial floating islands in Lake Kasumikaura, Aso, Japan are designed to dissipate half the incoming wave energy and reduce wave height to 40 centimeters, the critical wave height for vegetation growth. The vegetated area has expanded 3.4 percent per year.



A Glimpse of Paradise (2013) Christopher Wingfield, Lake Kariba, between Zimbabwe and Zambia,

Spread around the shores of the lake there are large papyrus reed beds and after a violent storm sections of these break away and float out into the open water forming floating islands. They are so strong and densely packed that an adult can easily walk on them. If they drifted close enough to the island we hooked them up to a boat and towed them in and then anchored them to the shore in the harbor. The wave action from the boats coming in and out was rapidly eroding the shoreline and the guest accommodation was in danger of being washed away. By breaking chunks off the main section of the floating island and packing them against the shoreline it had the effect of breaking up the wave action, which greatly reduced their erosive effect. The remaining section of island was anchored outside the dining room creating a small floating island.

A Construction Primer

Betty's Island is one of three artificial islands launched by floating-island enthusiasts in the 50-acre Buchanan Lake, Yakima, Washington Betty's Island is 30 feet by 30 feet, holds 12 cubic yards of soil to grow trees, sports a 40-foot snag for an osprey perch and weighs 36,000 pounds



Construction photos



Troughs between the floats hold dirt in suspended 5 gallon buckets

Towing into place



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Conclusion

Floating islands can be effective instruments for environmental protection, but we don't suggest that they are always the answer.

In fact -- and here we dampen a bit of our enthusiasm -- what makes a FTW effective can be counterproductive to the environment. See Chapter 82 for what can happen when a helophyte goes berserk.

CHAPTER 60 SHIVER

Lest there be misperception that floating islands are tropical phenomenon, to the right are the much-visited floating islands of Bingol, Turkey (Chapter 38).



Below, a 20-meter floating island near Prashar, India. The temple was built in the 13th century



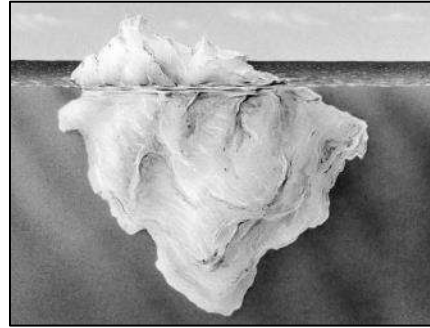
This chapter's about another kind of floating island, the one of James Milligan's "The Beckoning Skyline," The Beckoning Skyline: and Other Poems (1920).

*A frigid, baseless, drifting isle,
No home for man or beast or tree;
Cold purity without a smile,
Fair derelict of the northern sea.
The berg!*

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As icebergs are unequivocally distinct in composition from other floating islands, we'll group the subtopics into in a single chapter.

The central part of the Arctic Ocean is covered permanently by multiyear pack ice 2 to 10 meters thick, divided by crevasses and hummocks. In winter, ice covers nearly 11 million square kilometers; in summer, about 8 million square kilometers.















Arctic ice islands can be up to 30 kilometers long, but are rarely more than 60 meters thick. The best studied, T-3, north of Alaska, bore a manned scientific station from 1952 to 1974. The islands may make several circuits of the Arctic Basin, breaking up as they do this.

In an average year, several hundred icebergs drift into the Arctic between Svalbard and Greenland. A southern-drifting iceberg observed off Baffin Island in 1882 was 13 by 6 kilometers, 20 meters above the waterline and would have weighed in the order of a billion tons. Most Arctic bergs are much smaller, typical diameters being in the hundreds meters.

In the Southern Ocean, winter ice covers nearly 19 million square kilometers, but is rarely more than 10 meters thick. Summer melting and northward dispersal reduce the pack by almost 80 percent. Iceberg B-15, calved from the Ross Ice Shelf in 2000, was a kilometer thick and covered an area the size of Connecticut, but like their northern cousins, most Antarctic icebergs have diameters measured in hundreds of meters.

Icebergs can be classified by shape.

<p>Tabular</p> 		<p>Width: Height > 5:1</p>	<p>Flat-topped. Often with horizontal banding. Resembles flat sheet.</p>
<p>Wedge</p> 		<p>< 5:1</p>	<p>Flat topped. Steep vertical sides on one end, sloping to lesser sides on the other end.</p>
<p>Blocky</p> 		<p>< 5:1</p>	<p>Flat-topped. Steep vertical sides. Resembles a block</p>

<p>Domed</p> 		<p>4:1</p>	<p>Smooth, rounded top.</p>
<p>Pinnacle</p> 		<p>2:1</p>	<p>One or more central spires or pyramids</p>
<p>Drydock</p> 		<p>1:1</p>	<p>Eroded U-shaped slot near water level with twin columns or pinnacles.</p>

Despite being in the sea, icebergs consist of fresh water, either from incubational snowfall or a fresh water lamina perched on the oceanic surface.

As the tip of an iceberg warms, it loses mechanical strength and is easily eroded. The mechanical integrity of an iceberg derives from its "cold core" below sea level, where temperatures remain at -15 to 20 °C.

As ice has a specific gravity of 0.92, Archimedes' Law indicates that roughly 8 percent of its volume will project above a fresh water surface. As seawater has a specific gravity of 1.02, fresh-water ice will float with roughly 10 percent exposed. Entrained air may raise the formation another few percent.

A description from "Whittlings from the West," Hogg's Instructor (1851) by Abel Log.

I was awakened early the morning after by the novel and startling cry of 'Icebergs ahead!' Icebergs on the larboard bow and Icebergs on the beam!' I rushed hastily to the deck, and counted upwards of fifty of them. They were of a bright, bluish-green color, and glittered beautifully in the sunlight. Some looked like old castles and cathedrals ; others like floating islands of fretted silver; and one, with its hundred sparkling minarets and spires, like a fairy city emigrating. A large ship was sailing past it, and her maintop-gallantmast only reached one third the height of the berg. In calculating its total altitude, I did not forget to take into consideration the fact of there always being at least eight feet of ice below water, for every one that is above. Some navigators, indeed, say there are eleven.

The "Photograph" to the right, purportedly provided by Global Marine Drilling of St. John, Newfoundland.

The water was calm and the sun was almost directly overhead so that the diver was able to get into the water and click this picture.

It's a fake. The image is a composite: the sky, the iceberg top, shot in Antarctica, and the underwater iceberg, shot above water in Alaska, doctored and flipped, from The Essence of Imagination (1999) by Ralph A. Clevenger. Giveaways as to the deception:

Inexplicable under-lighting,
Distance far in excess of underwater visibility,
Less than one-tenth of total volume above the surface.



A legitimate closeup of a floating ice island's under-edge.



Icebergs that have rolled over, exposing basal ice, or have emerged from below water level, may appear green, brown or black, colorations caused by differences in density, air-bubble content and impurities. Black ice is of high density and bubble free. Dark layers indicate the presence of rock materials derived from the base of the parent glacier. Occasionally, rocks may be found on the original upper surface.



The 17th Century

While we're not out to chronicle the study of polar ice, a selection of early publications indicates the widespread use of the "floating island" moniker. For emphasis, we capitalize the term.

We'll note just one reference from this era, that of February 18, 1674 in The History of the Royal Society of London for Improving of Natural Knowledge... a Supplement to the Philosophical Transactions 3 (1757), by Thomas Birch, not for the remarkability of its metaphor, but for the company it keeps.

Mr. Henshaw read his discourse, giving an account of his observations.

I saw the Baltic full of FLOATING ISLANDS of ice moving towards the Sound; and, in the woods I rode through, I could not perceive anything green.

By proximity -- we respectfully submit -- the preceding entry irrefutably validates the importance of floating islands to modern science.

Mr. Isaac Newton, James Hoare, junior, Esq; were admitted,

The 18th and 19th Centuries

"Experiments and Observations upon Cold," Opera, en Anglois, avec Notes par P. Shaw (1738) by Robert Boyle.

Of compounded portions of ice, I find the following accounts. Mr. Hall, in his voyage to discover Greenland, tells us, he met with a huge bank of ice twenty four miles long. Another English sailor relates,

"that, even in June, the sea where he lay, was cover'd with ice, as far as he cou'd discern all around him, from a considerable eminence, except within a quarter of a mile from the shoar."

Whence that vast extent of ice shou'd appear as one FLOATING ISLAND.

"An Experimental History of Cold," The Works of the Honourable Robert Boyle (1772), also by Boyle,

Another of our English navigators mentions, that even in June,

"All the sea (wherein he was endeavoring to sail) as far as he could see from the top of a high hill, was covered with ice, saving that, within a quarter of a mile of the shore, it was clear round about once in a tide."

By which last clause, it seems, that this vast extent of ice was either one entire FLOATING ISLAND, or at least a vast bank or rand (as some seamen term it) of ice.

Letters to the Duchess of Lesdiguieres Giving an Account of a voyage to Canada (1763) by Pierre-Francois-Xavier Charlevoix,

You may here recollect, Madam, what I said in my first letter of the cold we felt in the dog days, from the neighborhood of a FLOATING ISLAND of ice, or rather from the wind which blew upon us from the side where it was, and which ceased the moment it was under the wind.


A Voyage to the Cape of Good Hope, Towards the Antarctic Polar Circle, and Round the World (1786) by Anders Sparrman and Georg Forster,

How disagreeably we passed the remainder of the summer in this hemisphere, may be gathered from this, that we made our way through FLOATING ISLANDS of ice, sometimes as big as mountains, till we came to lat. 67° 10", so that we are, and probably shall continue to be, the only mortals that can boast of the frozen honor (if I may so call it) of having passed the antarctic polar circle.

A sample of 19th-century periodicals and documentary literature

<p><u>A Voyage to Hudson's Bay: During the Summer of 1812</u> (1819), Thomas MacKeevor</p>	<p><i>The British Packet, Lady Hobart, ran against one of these FLOATING ISLANDS, higher than the mast-head, and of great extent, in June, 1803, and thundered; the crew and passengers saved themselves with great difficulty in two boats.</i></p>
<p><u>A System of Universal Geography</u> (1827), William Woodbridge</p>	<p><i>From the shores of the polar regions, lofty masses, termed icebergs, frequently break off, and form FLOATING ISLANDS. They obstruct the polar seas at all seasons, and are occasionally found as low as latitude 40.</i></p>

<p><u>The Gardens and Menagerie of the Zoological Society Delineated</u> (1830)</p>	<p><i>The White Bear. Appearing to be most at ease in those latitudes where the cold is most intense, it rarely migrates, even with its FLOATING ISLANDS, much beyond the precincts of the Arctic Circle.</i></p>
<p>"The Ocean," <u>Scientific Tracks</u> 2:7 (1832)</p>	<p><i>Not unfrequent do the regular packets from Liverpool to the U.S. fall in with these huge FLOATING ISLANDS. And vessels in the night have dashed to pieces, by driving against them.</i></p>
<p><u>A Ramble of Six Thousand Miles Through the United States of America</u> (1832), Simon Ferrall</p>	<p><i>Many vessels which depart from port with gallant crews, and are never heard of more, are lost, I am convinced, by fatal collision with these FLOATING ISLANDS.</i></p>
<p><u>Domestic Manners of the Americans</u> (1832), Mrs. Trollope</p>	<p><i>The idea of running against these FLOATING ISLANDS was really alarming, and I was told by many that my fears were not without foundation.</i></p>
<p><u>Natural History: A Popular Introduction to the Study of Quadrupeds</u> (1833)</p>	<p><i>The Polar Bear. His habitat may be considered as bounded by the arctic circle, below which he does not willingly pass; the northern and western winds, however, often drift numbers on FLOATING ISLANDS of ice to the coast of Siberia and the shores of Nova Zembla.</i></p>
<p>"The Sister of Charity," <u>North American Magazine</u>, January 1833.</p>	<p><i>I watched with delight, though not without apprehension, the tremendous FLOATING ISLANDS of ice -- those temples of the deep - - those wandering castles of the giant-fiend who dwells amid the lifeless midnight of the pole, as their thousand pillars gleamed in the sunlight and reflected a glory almost equal to that they received.</i></p>
<p>"Atmospheric Phenomena," <u>Magazine of Domestic Economy</u>, December 1838</p>	<p><i>Fogs, as stated in a previous paper, are common in the arctic seas, and frequently so envelop the FLOATING ISLANDS, as to render it invisible until very near to the ship.</i></p>
<p>"On The Mechanism of Glaciers," <u>Journal of the Royal Geological Society of Ireland</u> (1838), Robert Mallet,</p>	<p><i>Ice-islands or FLOATING ISLANDS of ice came as far south as the West India islands, one of unusual magnitude having reached the Bahama isles.</i></p>
<p><u>Five Months in Labrador and Newfoundland</u>, (1839), Ephraim Tucker</p>	<p><i>These FLOATING ISLANDS of ice, called icebergs, are objects of great interest to the beholder. Of the most fantastic forms, and splendid colors as seen from the refraction of the sun's light, the voyager gazes upon them as they wheel slowly by his little vessel with intense interest.</i></p>
<p><u>A Tour Through the Australian Colonies in 1839</u> (1840), A. Russell</p>	<p><i>Some of those icebergs presented a most magnificent appearance, like to FLOATING ISLANDS or mountains in size, though very different in color, they having a peculiar snowy appearance, sufficient to cast a bright halo around them in the darkest night.</i></p>
<p>"On the Boulder Formation," <u>London and Edinburgh Philosophical Magazine</u>, May 1840, Charles Lyell,</p>	<p><i>The banks on which icebergs run aground occasionally between Baffin's Bay and Newfoundland are many hundred feet under water, and the force with which they are struck will depend not so much on the velocity as the momentum of the large FLOATING ISLANDS.</i></p>

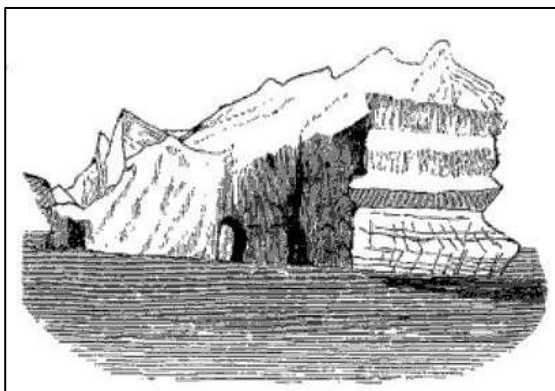
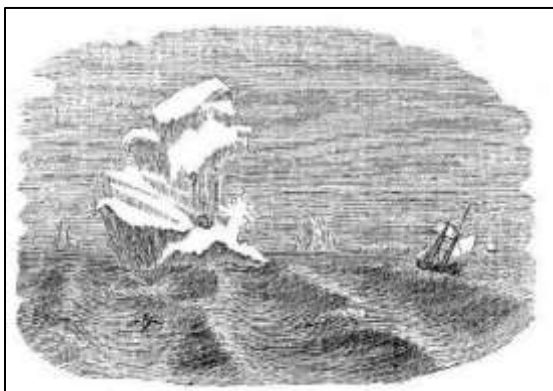
<p>"Siberia: Sledge Expeditions over the Ice on the Polar Ocean," <u>Asiatic Journal</u>, May-August 1840</p>	<p><i>Our travelers were again overtaken by a tempest, and once again they were sent adrift upon a fragment of ice. Their FLOATING ISLAND proved but a frail footing for them; in a little while they were struck by a huge toross, and the violence of the collision shattered at once the mass on which they stood, and that against which they had been flung.</i></p>
<p><u>Drift Ice and Currents of the North Atlantic</u> (1845), W.C. Redfield</p>	<p><i>Some of these FLOATING ISLANDS have been forced across the body of the stream, and in some cases even far beyond its ordinary limits, to a latitude lower than that of the southern boundary of Virginia;</i></p>
<p><u>A Step from the New World to the Old, and Back Again</u>, (1852), Henry Tappan</p>	<p><i>It is manifest that a ship in a fog among icebergs must be in imminent peril: she is among FLOATING ISLANDS, and she knows not at what moment she may run upon them.</i></p>
<p>"Lessons on Geology," <u>Popular Educator</u> (1853), Thomas Jenlyn</p>	<p><i>On the coast of Newfoundland, for instance, these FLOATING ISLANDS of dazzling crystal, are seen every year to melt away in the warm waters supplied by the gulph stream of the Atlantic, and they disappear in a few weeks.</i></p>
<p><u>Story of a Boulder</u> (1858), Archibald Geikie</p>	<p><i>The FLOATING ISLAND becomes gradually shrouded in mist and spume, streamlets everywhere trickle down its sides, and great crags ever and anon fall with a sullen plunge into the deep.</i></p>
<p>"An Iceberg Ten Miles Long," <u>Racine Daily Journal</u>, December 16, 1859</p>	<p><i>Captain Kirby, of the ship Uncowab, arrived at San Francisco from New York, reports that he passed an immense FLOATING ISLAND of ice bout fifty miles south of Cape Horn, on the 9th of August. It was eight to ten miles long, and a very high solid mass of ice, against which the sea broke as upon the iron bound shores of a continent.</i></p>
<p>"Icebergs," <u>The New American Cyclopaedia</u> (1860), George Ripley</p>	<p><i>The edges of glaciers extending many miles along a precipitous coast have been seen to fall with terrific violence into the sea beneath, and at once be transformed into FLOATING ISLANDS of ice.</i></p>
<p>"Van Amburch & Co's Mammoth Menagerie, Great Moral Exhibition and Egyptian Caravan," <u>Warsaw Western New Yorker</u>, July 6, 1865</p>	<p><i>A pair of White Polar Bears from the icy regions of the North Pole. These savage, intractable creatures were captured on a FLOATING ISLAND of ice over one hundred miles at sea.</i></p>
	
<p><u>A Textbook of Physiography or Physical Geography</u>: (1868), Edward Hull</p>	<p><i>The FLOATING ISLANDS of ice, which enter the North Atlantic through Davis Straits in early summer, and are often a cause of danger to ships crossing between America and Europe, have their origin chiefly in the vast snowfields and glaciers of Greenland.</i></p>
<p>"A Gigantic Iceberg," <u>The Fifth Reader</u> (1871) Lewis Monroe</p>	<p><i>The small and distant ISLANDS, FLOATING on the smooth sea, in the light of a clear day, look like little floating fairy isles of sapphire.</i></p>
<p>"An Ice-Berg," <u>Logansport Sunday Chronicle</u>, October 3, 1875</p>	<p><i>The FLOATING ISLAND becomes gradually shrouded in mist and spume, streamlets everywhere trickle down its sides, and great crags ever and anon fall with a sullen plunge into the deep.</i></p>
<p><u>The Messenger of the Sacred Heart of Jesus</u> (1881)</p>	<p><i>As the mysteriously beautiful FLOATING ISLAND bore slowly down upon them, his good angel whispered to the Father to make a vow of some special devotion to the Mother of God on their arrival.</i></p>

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<u>Zell's Popular Encyclopedia</u> (1882)	<i>Solitary icebergs are also of vast dimensions and instances are given both in Arctic and Antarctic voyages, of FLOATING ISLANDS of ice several miles; in circumference, rising from 40 to 200 feet above the sea-level, and loaded with blocks and shingle.</i>
<u>The Cruise of the 'Antarctic' to the South Polar Regions</u> (1896), Henrik Bull	<i>There is, then, a fair possibility that the FLOATING ISLAND had its origin among the Balleny glaciers and ice-cliffs, or, at least, had stranded in their neighborhood for a sufficient time to receive its layer of ashes or stone powder.</i>
"Imprisoned in an Iceberg," <u>St. Nicholas Magazine</u> , December 1884, C.F. Holder	<i>Whether it was "There she blows!" or "Whale o!" they could not make out; but seeing the lookout pointing toward the FLOATING ISLAND, they turned that way. The vessel had suddenly passed a projection of the berg that showed them its broad side and snowy peak looming three hundred feet into the air, and near the top, frozen in the icy block, was the black body of an immense whale.</i>
"Icebergs," <u>Marshfield Times</u> , June 29, 1888	<i>The crew of the German discovery ship Hansa were compelled to abandon their vessel, crushed by ice, and took refuge on an immense floating mass of ice, where they remained for eight months. Their FLOATING ICE ISLAND was seven miles in circumference, and drifted south, until the poor fellows were able to make their escape.</i>
"An Editor Abroad," <u>St Louis Christian Evangelist</u> , September 12, 1889	<i>Instantly the engines were reversed, the helm put hard a-port, the ship obeyed, but still ground her side against the FLOATING ISLAND with such force as to shake every timber.</i>
<u>The Ocean World: Being a Description of the Sea and Some of Its Inhabitants.</u> (1891), Louis Figuier	<i>One year with another these floating icebergs accumulate with very striking differences, and it is only by a rare chance that they open up a free passage such as Captain Weddell had discovered. These FLOATING ISLANDS of ice have been met with in 3 5° south latitude, and even as high as Cape Horn.</i>
"Saved by an Echo," <u>Rochester Daily Republican</u> , September 6, 1892	<i>In a dense fog the usual signals were being blown to warn approaching vessels, when the captain distinctly heard an echo in the distance. This could rise from but two sources -- a cliff or an iceberg -- and he knew there were no cliffs within a hundred miles. Therefore it must be an iceberg, and the helm was put down to clear this great danger. In a few minutes the ship skimmed the edge of a great FLOATING ISLAND of ice, and the captain inwardly blessed the echo.</i>
"Icebergs," <u>Scribner's Magazine</u> , August 1892, N.S. Shaler	<i>The charm of these FLOATING ISLANDS consists, in part, in singularity and variety of forms, and in the beauty of coloration; but in larger part the effect is due to the weird loneliness and lifelessness of their crags and steepes.</i>
"Rounding the Horn. How Icebergs Delated the Passage of the Passage of Donna Castle," <u>Philadelphia Inquirer</u> , May 22, 1893	<i>"It was on March 27," said Captain Jones yesterday, in latitude 50.20 north, longitude 50.21, that a monster berg loomed up before us. It appeared like a huge FLOATING ISLAND, being fully 800 foot high and about half a mile long."</i>

<p>"A FLOATING ISLAND of Ice," <u>Watertown Daily Times</u>, February 12, 1895</p>	<p><i>A cake of ice of considerable thickness, about three-quarters of a mile long, and over half a mile wide, drifted down the North River yesterday. It swung around the Battery and was carried with the tide, settling over into the East River toward Brooklyn. It struck the Liberty Statue boat, which was lying at the Battery dock, and stove a hole into her port side, forward of the engine room.</i></p>
<p><u>Old Whaling Days</u> (1895), William Barron, describing an event near Cape Hooper in Davis Strait,</p>	<p><i>Taking a gun with me, I pulled towards the supposed land, and found it to be a large sconce of heavy ice, covered with gravel, sand, and large stones, some of which would weigh upwards of a ton This piece of ice must have been attached to the land under a perpendicular cliff... This large piece of ice (or, as it may be termed, a FLOATING ISLAND) was about one mile in circumference and twenty-four feet thick.</i></p>
<p><u>Great Achievements of the Century</u> (1898), James Buel</p>	<p><i>More dangerous than hidden shoals and sunken cliffs to the navigator are the FLOATING ISLANDS of ice when swung about and grind one another, or break up with a force that will crush any ship.</i></p>

A few 19-th century illustrations



And lest we assume that 20th-century journalism has moved beyond the idiom, a few snippets.

"Hard Lives of the Lake Erie Fishermen Who Supply the Winter Markets," Philadelphia Inquirer, January 12, 1902,

People must have their fish in winter as in summer, and so the winter fishermen of Lake Erie, hardy Bedouins of the white desert, face constant suffering and the imminent peril of life and limb to fill their little dogsleds for the market. The lake ports are full of men who lack an ear, a few fingers or a foot. The explanation is simple: "Lost on the ice overnight." Sometimes it is a more grisly fate, and the victim is not discovered until the ice breaks up in the spring and some FLOATING ISLAND touches the shore with its ghastly freight.

"Perils That Sailors Dread. Sailors Are in Great Danger in the Winter -- Ice Terror's Many Forms," Rochester Democrat Chronicle, February 16, 1902,

A man is always aloft, fifty feet above the deck to act as a pilot, for there he can see the fissures ahead and direct the steersman just where to poke the ship's nose in the ice field. Like a sparrow on a telegraph pole does this pilot seem. He calls his orders through a trumpet and the ship picks its way like a suspicious kitten, now dodging around this FLOATING ISLAND of ice, now pushing that aside, now backing away and coming on like a flying wedge for a dash on the solid barrier. Sometimes dynamite is resorted to, to break up a stubborn field when there is open water beyond.

"Boarded an Iceberg. The FLOATING ISLAND That Wrecked a Ship Saved Its Crew," Batavia Daily News, June 22, 1912,

Curious indeed was the experience of the crew of the German ship Hansa with an Iceberg. The Hansa struck an ice island in latitude 52 degrees a little before midnight in a freezing gale. The impact carried her bow far up on the berg and imbedded it firmly in the ice. Her back was broken by the force of the collision and before morning was wrenched away from the forward part by the battering seas and sank.

When the Hansa struck the boats were lowered, but only one escaped being swamped after pulling away from the doomed ship. It was soon found, however, that this boat was leaking and that no amount of balling would keep it afloat more than a few hours, so the mate in command of it made for the berg and succeeded in climbing up on it to a place of temporary safety. From the broken timbers of the Hansa's bow the castaways built a rude shelter and snared sea birds to eke out the scanty supplies they had been able to save from the ship.

The berg held together for eight months, and the Hansa's men traveled 750 miles before they were finally picked up to latitude 41 degrees, suffering from frostbites and hunger, but otherwise no worse for their long exposure.

"Into the Light," Brooklyn Daily Star, July 22, 1926,

I climbed the breathless heights of Mount Everest, far beyond the line where vegetation struggles and writhes and dies in the rare thin air; I was an arctic explorer, marooned on a cake of ice, with no companion save, a round-eyed wondering baby seal, sleek and black and eagerly flashing in the jade green water which lapped at the side of our chill FLOATING ISLAND for little silvery fish. I -- but why go on? It may sound ridiculous and fantastic, but it worked.

Utica Daily Press, March 8 1928,

When on the Arctic shore or when crawling on FLOATING ISLAND of ice, the walrus is awkward, but let him get into the water and he is at home.

"South Wind Blows About Ten on Ice," Buffalo Evening News, February 9, 1931,

Thirty-eight hours of physical effort that would tax the strength of an athlete, a day and night and another day without sleep and practically no food, then to be trapped for another night in the same predicament as the men you sought to rescue.

The FLOATING ISLAND of ice on which the party was marooned was drifting at midnight in the general direction of Woodlawn under pressure of a southwest wind.



"400 Fishermen Taken From Ice," Amsterdam Daily Democrat and Recorder, February 12, 1934,

Most of the men were anywhere from one to two miles out when a crack five miles long and 100 to 300 feet wide cut them off from a direct retreat to shore.

The break was found while the fishermen were on a peninsula of ice off Sturgeon Point, Athol Springs and Pinehurst, all south of Buffalo. Coast Guardsmen, pushing their boats ahead of them until open water was reached, were able to warn all of the men before the "peninsula" became a FLOATING ISLAND.

"Current Comment," Naples News, March 23, 1938,

Leader Papanin radio operator Krenkel, astronomer-magnetologist Fyodorov, hydrobiologist, Shirshov, the Russian adventurous scientists, were rescued from their temporary home on an Arctic ice floe, February 19th. They've occupied their abode on the FLOATING ISLAND for nine months, and in that time had floated 1300 miles from their starting place, 12 miles from the North Pole.

"On a FLOATING ISLAND, U.S. Arctic Drifting Stations," Science; March 18, 1966.

"Iceberg Threatens 'March of Penguins' Colony," NPR news, February 26, 2010,

An enormous iceberg in Antarctica plowed into a peninsula made of ice and snapped it off, creating a second gigantic iceberg. The new 48-mile-long FLOATING ISLAND of ice could make life difficult for the penguin colony made famous by the movie "March of the Penguins."

"Giant Antarctic Iceberg the Size of Singapore on the Move," Time, November 13, 2013,

Grant Biggs, the principle investigator on the project, told the BBC that if this current iceberg follows the trajectory of previous ones, it will bring the Singapore-size FLOATING ISLAND of ice into international shipping lanes.

T-3

The T-3 Ice Island was a 3 by 7 mile tabular iceberg in the Beaufort Sea, 125 feet thick, of which 10 was above the surrounding ice. Surrounded by ice floe, the iceberg was virtually indistinguishable at any distance.

Fletcher's Ice Island, code-name T-3, was sporadically occupied between 1952 and 1978 by United States scientists, whose base included huts, a power plant and a runway for wheeled aircraft. The Soviets operated six similar stations elsewhere. Because of the island's movement, it was necessary to operate from two resupply bases: Point Barrow, Alaska and Thule Air Base, Greenland.



Note the "floating island" in news items from the period.

"Giant Globemaster Lands Safely on FLOATING ISLAND Near North Pole," Elmira Star Gazette, September 18, 1953

"Navy Back at Sea," Troy Times Record, August 12, 1958,

The Navy blimp ZPG-2 arrived at its home base today after a scientific mission to the Arctic designed to test the usefulness of such lighter-than-air craft in research in polar areas. During its voyage it visited a 45-square mile FLOATING ISLAND of ice only 800 miles from the North Pole being used by American government scientists as an observation post.

"Blimp Goes Deepest Ever into Arctic," Binghamton Press, August 9, 1958,

A U.S. Navy blimp was on its way to a FLOATING ISLAND less than 500 miles from-the-North Pole today after penetrating deeper into the Arctic than any non-rigid aircraft ever had before.

The orange-and-silver blimp landed yesterday at Resolute Bay on Canada's Cornwallis Island, within the Arctic Circle, after soaring 1,000 miles in 22 hours with the help of a 10 mile-an-hour tail wind.

Its next scheduled stop was T3, a FLOATING ISLAND manned by scientists as part of the International Geophysical Year.

T-3's clockwise route, April 1952 to May, 1966. As shown by the arrow to right, sometime after July 1983, T-3 worked its way out of the Arctic ice pack via Fram Strait, drifted into the Atlantic and melted.



Inter-Island Sediment Transport

In an 1842 address to the Association of American Geologists and Naturalists, Benjamin Silliman suggest that icebergs may play a role in sediment transport.

In the case of a drifting island... Suppose an island of ice to be detached from the great southern barrier, having its base loaded with rocks, &c., and after drifting several hundred miles northward, to experience an overturn bringing these rocks to the surface. It then floats on for a considerable distance farther, till from the equilibrium being again destroyed, the rocky portion settles down and resumes its original position. These alternations may occur several times

Driven landward by the heavy westerly swell into the continental northern current, it is at length stranded on the coast of South America, and undergoes one or more overturns, bringing up at each time an additional amount of material. It then is forced off by a strong off-shore wind, and after drifting still farther north is stranded again, perhaps at a long distance from its first anchorage. New overturns follow, fresh materials are accumulated, but from waste, the whole mess becoming lighter, it is once more floated off, and pursuing a somewhat devious course toward the tropics, is gradually melted away.

Artificial Icebergs

Project Habbakuk was a British plan to construct an aircraft carrier out of pykrete, a composite of wood pulp and ice, 6:1 by weight, for use against German U-boats. Due to an Admiralty clerk's error, it was "Habbakuk" rather than the correct biblical reference, "Habakkuk."

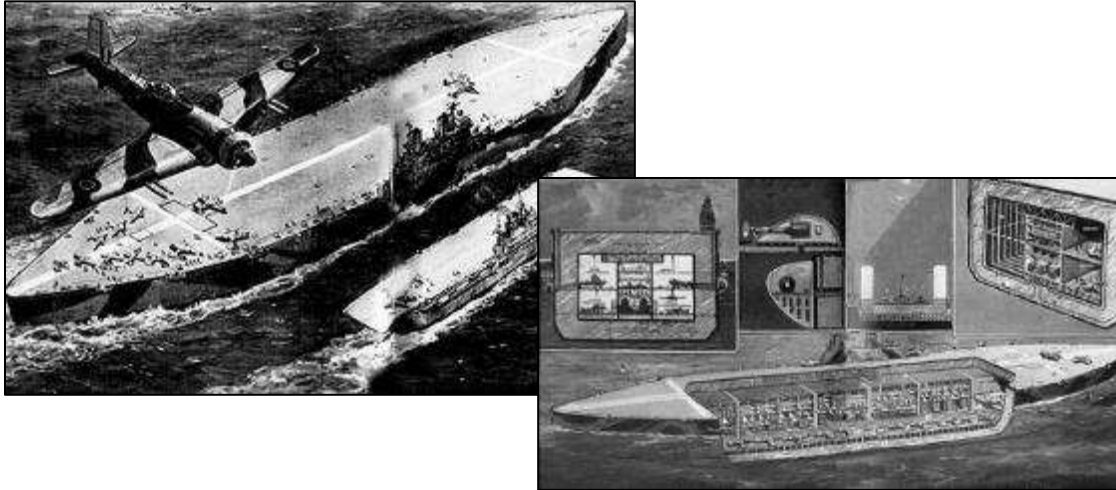
Pykrete is a super-ice, strengthened by mixing in 1 portion of wood pulp to roughly 6 portions of water, as the slurry freezes. Pykrete has high crush resistance: a one-inch column will support an automobile. Pykrete has a relatively slow melting rate due to its low thermal conductivity.

	Ice	Concrete	Pykrete
Crushing strength, MPa	3,447	17,240	7,584
Tensile strength, MPa	1,103	1,724	4,826
Density, kilogram/cubic meter	910	2,500	980

Pykrete can be manufactured for one percent of the energy required to make an equivalent mass of steel, molded by low-cost forms into any shape and planed just like wood.

A 7.69-millimeter bullet, fired into pure ice, will penetrate about 36 centimeters. Fired into pykrete, it penetrates less than half that -- about the same distance as if fired into brickwork.

Constructed from 40-foot blocks of ice, Habbakuk was to be 2000 feet long and 300 feet wide, with 200-foot vertical sides, of which 150 would have been below water. The vessel would displace 26 times that of the Queen Elizabeth, making it the largest artificial seaborne object in history. Its 40-foot-thick walls ("torpedo-proof") would enclose two decks of hangers for 200 fighters and 100 twin-engine de Havilland Mosquito bombers.



The hull would be insulated by a 9-inch, 27-layer composite shell of plywood and Masonite-type boards. The shell would be attached to the hull by 18-inch dowels embedded in the ice. Construction would require 300,000 tons of wood pulp, 25,000 tons of fiberboard, 35,000 tons of timber and 10,000 tons of steel.

The hull in the drawing is a misrepresentation, as pykrete is not the color of white of ice, but rather a light brown or tan, and in any case, the sides would be clad with laminate.



Twenty-six side-mounted 1000 horsepower variable-speed electric motors in underwater pods would propel the warship, a la the trolling motors used for bass fishing. A rudder over 100 feet high would also be needed. A diesel generator would power the vessel at 7 knots for 7000 miles.

We'll have more to remark on the modeling of the ice ship in Chapter 76, but here's the spoiler announced the end of 1943,

The large Habbakuk II made of pykrete has been found to be impractical because of the enormous production resources required and technical difficulties involved.

Fiction

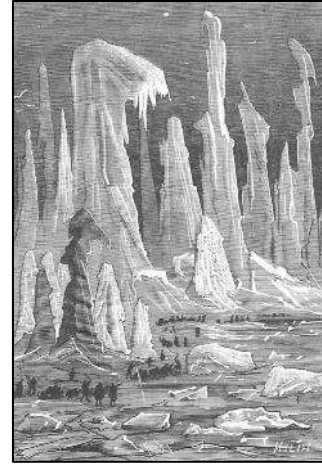
Icebergs are not infrequent in tales of oceanic adventure. Jules Verne included no less than four such encounters.

Twenty Thousand Leagues Under the Sea: (1873)

Some of these masses showed green veins, as if long undulating lines had been traced with sulphate of copper; others resembled enormous amethysts with the light shining through them. Some reflected the light of day upon a thousand crystal facets. Others shaded with vivid calcareous reflections resembled a perfect town of marble. The more we neared the south the more these FLOATING ISLANDS increased both in number and importance.

The Fur Country (1875)

The peninsula of Victoria, which the best maps of English America join to the American continent, had been torn suddenly away from it. This peninsula was in fact nothing but an immense piece of ice, five hundred square miles in extent, converted by successive deposits of sand and earth into apparently solid ground well clothed with vegetation. Connected with the mainland for thousands of centuries, the earthquake of the 8th of January had dragged it away from its moorings, and it was now a FLOATING ISLAND, at the mercy of the winds and waves, and had been carried along the Arctic Ocean by powerful currents for the last three months!



The Waif of the "Cynthia" (1885)

They related all that had befallen them—their fears and despair during the night, their vain appeals, their useless anger. The "Alaska" had been found in the morning to be almost entirely clear of the ice, and they had dislodged what remained with the assistance of their gunpowder. Mr. Bosewitz had taken command, being the second-officer, and had immediately started in search of the FLOATING ISLAND, taking the direction in which the wind would carry it. This navigation amidst floating icebergs was the most perilous which the "Alaska" had as yet attempted; but thanks to the excellent train

An Antarctic Mystery (1897)

From the 15th of December the difficulties of navigation increased with the number of the drifting masses. The wind, however, continued to be uniformly favorable, showing no tendency to veer to the south. The breeze freshened now and then, and we had to take in sail. When this occurred we saw the sea foaming along the sides of the ice packs, covering them with spray like the rocks on the coast of a FLOATING ISLAND, but without hindering their onward march.



A few floating-ice-island tales by other authors, beginning with Wisconsin's frozen Lake St. Clair (Chapter 53) in "A Night on the Ice," a bodice-ripper from Graham's American Monthly Magazine, July 1848, by "Solitaire." Edgar Allan Poe was the editor some years before

My companion, by every means he could think of, was forcing me back to consciousness; but I clung with the tenacity of death to my sweet dream. He dashed my body upon our FLOATING ISLAND; he pinched my flesh, fastened his fingers into my hair, and beat me into feeling with the power of his muscular arm.

At the Back of the North Wind (1871), by George MacDonald,

Some of the icebergs were drifting northwards; one was passing very near the ship. North Wind seized Diamond, and with a single bound lighted on one of them--a huge thing, with sharp pinnacles and great clefts. The same instant a wind began to blow from the south. North Wind hurried Diamond down the north side of the iceberg, stepping by its jags and splintering; for this berg had never got far enough south to be melted and smoothed by the summer sun.

After a little while Diamond went out and sat on the edge of his FLOATING ISLAND, and looked down into the ocean beneath him. The white sides of the berg reflected so much light below the water that he could see far down into the green abyss. Sometimes he fancied he saw the eyes of North Wind looking up at him from below, but the fancy never lasted beyond the moment of its birth.

"Wrecked on an Iceberg," The Standard Authors Reader (1883),

A strong breeze sprang up, which sent her at the rate of some seven knots an hour through the water far away from the iceberg. Before, however, she had run out of sight of that FLOATING ISLAND, the glittering summits were seen to lean forward, and, with a crash which could be heard by us at so great a distance, to fall prostrate in the water.

"A Case of Fate," Argosy, May 1900, by W. Bert Foster,

Held prisoners in a water washed cell of this circling isle of ice, swept whither the wind and the ocean currents pleased, threatened by the added danger of the disintegration of the vast mountain of crystal by the warmer water beneath, how slight indeed was the possibility of their escape!

"Think of it. The sun shines down this tunnel above us and into the crack here for a short time only. We should expect partial darkness for the rest of the day."

"Ah, but it does shine in upon us -- at least twice in the day," she said, with some satisfaction. "How long has it been between the appearances?"

"Four hours."

"There is but one explanation. Suppose, for instance, this shaft is surrounded by high -- ahem! - - rocks -- pinnacles of rock, perhaps. The sun shines clear to the bottom of the shaft -- which, we will say, is somewhat slanting -- some time during the forenoon. It could not penetrate to the cave again until the next day unless the shaft changed its position."

"But how?"

"If the shaft, within a space of four hours or so, had swung around half the orbit of a very large circle, the sun might shine in again, eh?"

"But how could it be so? Are we afloat? Are we not on solid land? Is this a FLOATING ISLAND?"

"You have said it," replied Laine, seriously. "We are on a FLOATING ISLAND. A FLOATING ISLAND of ice."

"An iceberg!" gasped the girl.

"And, following the nature of such phenomena, it is swinging in a circle as the winds and currents sweep it along. We are, my poor girl, imprisoned in a water washed cavity of this berg."

"Whitewash Tells of Ride on Iceberg," Oakland Tribune, December 14, 1938,

Polar Bear Once Lived on FLOATING ISLAND near North Pole

Mr. Whitewash, the jolly Polar Bear gentleman, finished the popcorn Nurse Jane Rave him. He licked the salt and butter off his paws and looked at Uncle Wiggily, and the animal boys and girls gathered around the rabbit gentleman.

There was a party in the hollow stump bungalow. Mr. Whitewash was tolling some adventure stories.

"So you want to know what J had to eat, do you?" asked the big, white bear gentleman,

"Yes," said Baby Bunty. "Tell us about the time when you lived on an iceberg at the North Pole with your mother bear."

"The Dueling Machine" (1969) a short story by Benjamin Bova and Myron Lewis,

He diligently set about combing the iceberg, determined to find Odal and kill him before their FLOATING ISLAND disintegrated. He thoroughly explored every projection, every crevice, every slope, working his way slowly from one end of the 'berg toward the other. Back and forth, cross and re-cross, with the infrared sensors scanning three hundreds sixty-degrees around him.

Desolation Island (1991) by Patrick O'Brian,

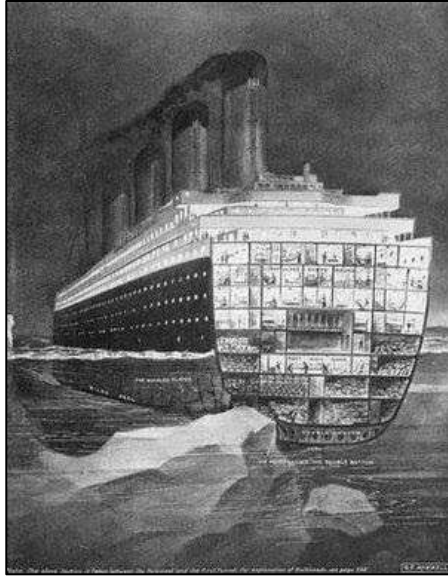
"Ice," thought Stephen as he stepped into the cabin, "and perhaps the greatest southern penguins, eared seals, the sea elephant... How I should love to see a mountain of ice, a FLOATING ISLAND.

Floating Island Meets Floating Island

The April, 1911 sinking of the Titanic with loss of 1,513 passengers and crew provides an intersection of two familiar metaphors:

The iceberg as a "floating island."

The great ship as a "floating island."



We'll cite three pieces to that effect, beginning with a once-held legal theory. From "Ship Captain's Power and Duty," Locomotive Engineers Journal, October 1911,

No czar has more power within his territory than has the captain of the great Atlantic liner on the high seas. He is on an island of his country's ownership, a FLOATING ISLAND.

"The Floating Islands. Atlantic Traffic and its Future," Living Age, February 1911, speaks to the vessel's magnificence.

Today, at floating city; tomorrow, a FLOATING ISLAND. No other word is spacious enough for the gigantic ships now coming into existence. Next midsummer the largest ship in the world will be ploughing the Atlantic under the flag of the White Star Line. This vessel, the Olympic, launched at Belfast two months ago, and her sister-ship, the Titanic, which is expected to take the water a few months hence, will each have the enormous tonnage of 45,000.

Breaking news of the disaster, too hopeful: "Lifeboats Crippled Vessel Steaming to Halifax," London Evening News, April 15, 1912,

The biggest ship in the world, the Titanic, has met with disaster on her maiden voyage. She collided with an iceberg last evening, 270 miles from Cape Race, and was reported in a sinking condition. Not till after two o'clock this afternoon was the tense anxiety in London relieved by the news that all the passengers had been put off in lifeboats, and that the liner Virginian was standing by her. The sea was calm.

Later, it was reported that the Titanic was still afloat, and making her way to Halifax. Only last Wednesday the Titanic, the pride of the White Star Line and the very last word in shipbuilding, sailed majestically from Southampton to New York, crowds of people watching her stately progress. "A FLOATING ISLAND", "a gorgeous hotel on the waves", "a town in motion", were some of the admiring phrases bestowed on her.

This mighty vessel dwarfed the Oceanic and the New York, both huge liners in their day. The very suction caused by her screws caused the seven mooring ropes of the New York to snap like threads.

Photos purported to be of the iceberg.



From the steam trawler Etonian two days before the disaster



From the cable ship Minia which raced to the scene.

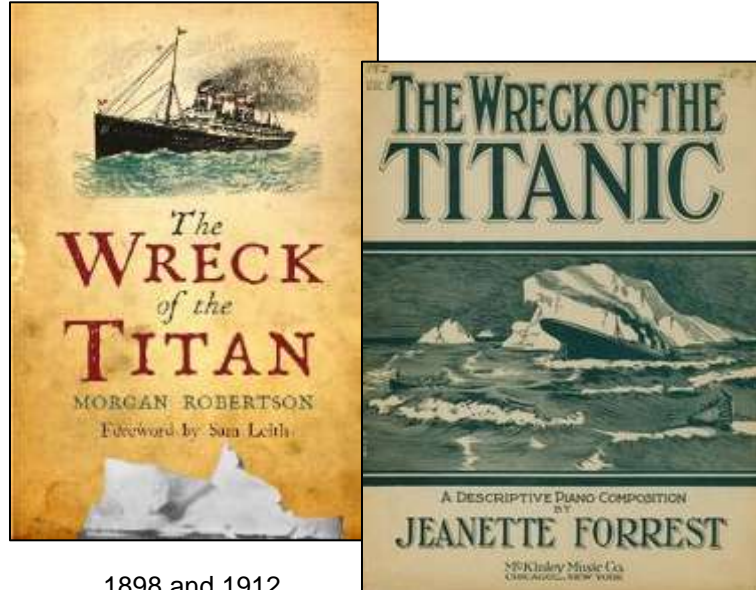


From the liner SS Prinz Adalbert the day after the disaster

Fact foreseen by fiction.

Morgan Robertson's The Wreck of the Titan, or, Futility (1896) is about a great luxury liner sunk by an iceberg

And he was adrift on a FLOATING ISLAND of ice, with the temperature near the freezing point, and without even the rude appliances of the savage.



1898 and 1912

Metaphoric Icebergs

Two quotes from Ernest Hemingway, the first from Death in the Afternoon (1932),

The dignity of movement of an iceberg is due to only one-eighth of it being above water. A writer who omits things because he does not know them only makes hollow places in his writing.

The second, from an interview with George Plimpton, "The Art of Fiction No. 21," Paris Review 18, Spring 1958,

I always try to write on the principle of the iceberg. There is seven-eighths of it underwater for every part that shows. Anything you know you can eliminate and it only strengthens your iceberg.

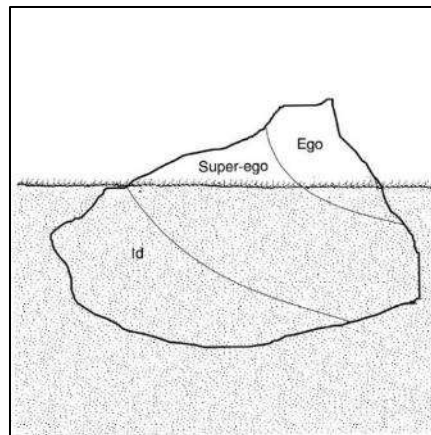
The idiom "tip of the iceberg" for the small, noticeable part of a problem, the total size of which is much greater, is largely a 20th-century addition to English usage, no doubt advanced in popular use by the tragedy of 1911.

From Interim Hearing: Foreign Investment Trends in California, Interim Hearing: Foreign Investment Trends in California (1900), California Legislature Committee on International Trade and Intergovernmental Relations

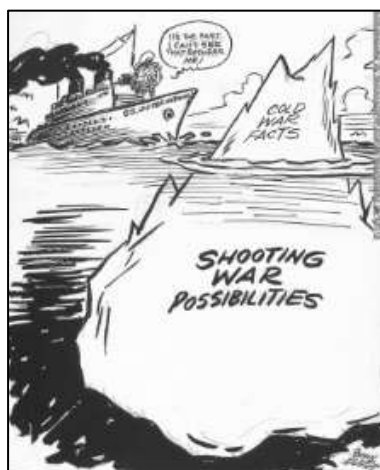
Transportation is a problem which inevitably finds its way to your bottom line. But that is just the tip of the iceberg. There are numerous issues which affect the quality of your life here that should also concern you.

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To the right, metaphoric application to the field of psychology.



Below, political cartoons of unseen perils.



Legal Status of Sea-Borne Ice

Floating islands of ice are permanently on the move, mixing with each other and crossing jurisdictional boundaries. As attaching ownership would create political and legal chaos, most international jurists reject such claims, the unexecuted Chilean Presidential Decree of 1940 claim to pack-ice, being an example.

The idea of territorial acquisition, especially the larger floes and icebergs, has had some adherents, however, one being Rene Waultrin, "Le Probleme de la Souverainete des Poles," Revue Generale de Droit International Public 16 (1909).

We have to do with icebergs sufficiently extensive to be compared with islands, probably as impermanent as islands of the volcanic origin, but just as these islands regarded to be indefinitely permanent... there is nothing to prevent us to recognize them as a permanent ground, set in a lasting motion perceivable only to those who observe it.

Geographically unsurprisingly, perhaps, Soviet law likewise has positioned itself in favor of limited acquisition. W. Lakhtine, in "Rights over the Arctic," American Journal of International Law (1930), links the status of floating ice with the theory of polar sectors.

Floating ice areas should be treated from the legal point of view on a par with polar high sea, while ice formations which are more or less motionless should have the legal status of polar territories. Polar states acquire sovereign rights over such ice formations within the boundaries of their sectors.

Russian jurist Korovin, interpreting the decree of the Presidium of the Central Executive Committee of the USSR, 1926, on the incorporation of lands and islands situated in the Arctic Ocean, stated that the rights of the Soviet Union extend to the entire polar area. The Soviets never advanced the claim in international court, however.

From "Floating Island," Lockport Union Sun Journal, March 14, 1962, regarding the American research station on iceberg T-3, discussed earlier in this chapter,

One of Uncle Sam's arctic ice islands has strayed off the reservation. It's not much as a piece of real estate, but this particular island, populated by six polar bears, 11 American scientists and a marooned American journalist, could become important because it has drifted into waters claimed by the Soviet Union.

Russian-manned ice islands have intruded into American waters in the past without incident, and Washington is hopeful there'll be reciprocity now. It will be a test of whether Russia and the U.S. can keep the cold war's troublesome tensions away from scientific research in the arctic.

Although it seems unlikely the Kremlin would make this oversized ice cube a new hot spot in the cold war, we advise those 11 scientists aboard to keep cool. Let Washington worry about the Kremlin. You just keep an eye on those polar bears.

Law

U.S. v. Escamilla dealt with the question of criminal jurisdiction over T-3, where a researcher was shot and killed in 1971. While the ice island was in Canadian waters at the time, only American citizens were involved and the United States was the only state in a practical position to maintain order,

Two problems, however, related to the exercise of American jurisdiction, the first being the basis. Was the island a vessel? Could it be assimilated to land? Was it a new category? The second problem dealt with potential concurrent jurisdiction. While the United States neither claimed sovereignty over the island nor recognized such claim by others -- a position similar to the one held in relation to Antarctic claims -- it wished to avoid a dispute with Canada. The quandary was dodged by a waiver on the part of Canada embassy.

The Canadian government continues to reserve its position on the question of jurisdiction over the alleged offence but would not object to having the drifting ice formation in question treated as a ship for the purposes of the particular legal proceedings concerned in order to facilitate the course of justice and if it is considered necessary for the purposes of the legal proceedings in question the Canadian Government hereby waives jurisdiction.

The broader question of legal regime remains unresolved.

Residents

Chapters 42-45 deal with creatures to be found on floating islands, but here we'll note those particular to islands of ice. Residents include the penguin, walrus, polar bear and seal, the first in the Antarctic, the other three in the Arctic,

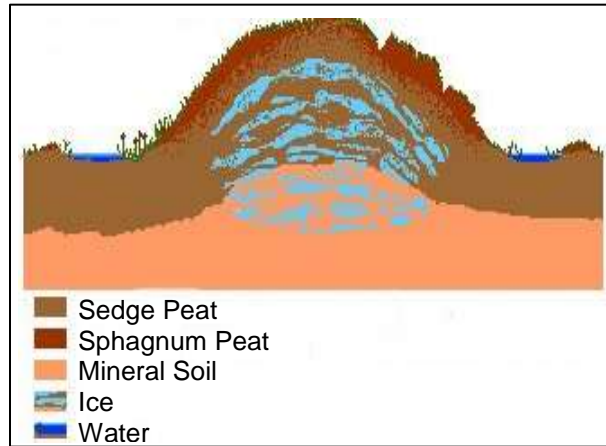


Palsas

Palsas are low, often oval, frost heaves occurring in polar and sub-polar peat bogs and wetlands, which contain permanently-frozen lenses of segregated ice and peat or mineral soil. Palsas can be several meters in height and are generally less than 100 meters in diameter. Large palsas tend to be less conical than small ones.

Palsas initiate where the winter freezing front penetrates more rapidly than in surrounding areas, possibly due to reduced thermal insulation due to thin snow cover, and a core of frozen soil persists through the summer. As the surrounding water-saturated peat warms in the summer, its densified water wedges into the pulsa, lifting the overlayer.

The elevated soil surface (especially if organic) will tend to dry and the dry peat's thermal insulation help keeps the interior temperature lower than that of adjacent ground, exacerbating the lateral inflow from the thawing surroundings.



By the same freeze-thaw manner, summer precipitation can lift "palsa plateaus."



Palsas are frequently described as "floating," ("like a cork" in one reference), but in reality, the uplift is the cumulative sum of numerous ice lenses, each rarely individually thicker than a few centimeters.

Towing and Iceberg

Below, a proprietary scheme for harnessing an iceberg and a photographic representation of an iceberg under tow. Proposals to this end have been put forth for two centuries, but without success.



And Onward into the Hollow Earth

On this topic, we must choose between noting a passing reference or chronicling the bizarre history to which it alludes. We'll opt for the former, but for those interested, the saga of "the celebrated Captain Symmes" is pursued in *Underground Rivers* by the author. From "New and Interesting Projects," *Mirror*, May 1, 1824,

A plan for blowing up and dissolving the ice in the Arctic Ocean, with the exception of a field of a mile square, on which a colony is to be established, and the floating island, towed like a steamboat into the Pacific Ocean. It is to be confessed that this is a somewhat hazardous project, but its daring and improbability of success are the very reason why it is sure to meet with the readiest support. A promise has already been made to the celebrated Captain, Symmes, not to approach within thirty feet of the opening at the pole, to the center of the earth, which he claims as the first discoverer.

CHAPTER 61

LOOK FOR A TRASHCAN



This chapter deals with the relationship between floating islands and rubbish from two perspectives:

The micro perspective, noting "floating island"-themed merchandise marketed for our unquenchable consumerism, and

The macro perspective, the global pollution that is said to be "floating islands."

Both perspectives are somewhat dismal.

Merchandise

To categorize manufactured items as "junk" is, of course, somewhat subjective. As noted in "Rubbish," Chambers's Journal, September 20, 1879,

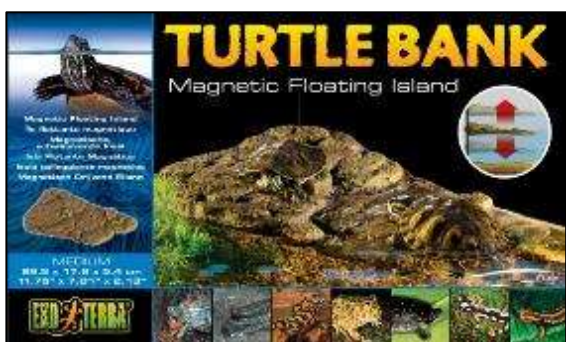
Truly, as one man's meat is another man's poison, so one man's rubbish is another man's treasure.

That said, there are on the market, an onslaught of "floating island" products of questionable quality, marginal aesthetic, environmentally problematic, and destined for trash bin after their novelty has worn off. Though we'll have objectors, we realize, we'll call such items "rubbish."

We'll confine ourselves to items explicitly advertised to be "floating islands," ignoring the bushels of like products advertised not with those words.

Let us begin at perhaps an odd starting point for those of us who don't delight in turtles, but seemingly a must-have for home aquariums.

SUDO Original Turtle Floating Island from Taiwan



The Exo Terra Turtle Bank "allows turtles easy access to a dry basking area for maximum exposure to heat and UVB lamps." Available in 3 sizes.

Apparently every well-loved turtle should have one.



The Home Safari offering.

Bath time plastic for the younger set, this one featuring Gilligan, the Captain and Mary Ann on an island with a hut, palm tree, boat, raft and treasure chest.



Below, the Mini Lala Oopisi and Dora the Explorer products.



Scores of recreation inflatables are on the market, inevitably bearing smiling models of petite stature. Not all such puncture-prone plastic products are labeled as "floating islands," but many seem to be.





We've no doubt that any number of other brightly-colored, short-lived consumables fly the "floating island" banner, but we really don't need any of them.

And now to the macro.

The Pacific Gyre

Oceanic "gyres" are locations where wind and sea currents cause material entrapped within the current to concentrate. In the center 5000 square-kilometers of the Pacific gyre between Hawaii and California float millions of small and microscopic pieces of plastic.



Above left: an oft-posted unattributed photo of the "Pacific Gyre Island of Trash," which in fact is not as advertised. The debris are too large -- it takes up to a year for trash from China to reach the center and 5 years from the United States. Above right: floating particles from the Pacific gyre, most pieces smaller than a pinkie fingernail. As the vast majority of gyre particles are almost microscopic and dispersed in the order of 1 piece/cubic meter of seawater, the sea surface does not appear to be polluted to the casual eye. The concentration has increased significantly over the past 40 years. The elevation of the trash photo suggests wash-up on a beach near a disposal site.

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The refuse dynamic is a complex, as illustrated by "Density of Plastic Particles found in zooplankton trawls from Coastal Waters of California to the North Pacific Central Gyre," Proceedings of the Plastic Debris, Rivers to Sea Conference, 2005, by C.J. Moore, G.L. Lattin, A.F. Zellers.

In the nearshore environment, where suspended sediments are prevalent, plastic bags and objects may accumulate sediments, making plastics that would otherwise float, sink. As soon as a plastic object enters the marine environment, it begins a fouling process which includes the creation of surface films, followed by the attachment of diatoms, algae, bryozoans, crustaceans and other organisms. At different stages of fouling, the associated organisms may make the plastic object more likely to sink or float. Floating plastics that become fouled and sink below the photic zone may lose their fouling organisms when they are deprived of sunlight. The organisms may be consumed or slough off and the object may then float back to the surface.

Should this fouling cycle repeat itself, a sort of 'yo-yo' effect could take place, with plastics sinking and rising indefinitely. Adding to the uncertainty of where to sample for plastic particulates is the fact that significant mixing can occur due to wave activity at the surface.

Salt and sun eventually degrade the material into a persistent stringy, toxic jello-like substance which remains within 10 meters of the surface. At least a million seabirds and 100,000 marine mammals and sea turtles are thought to perish annually from ingesting the polymers.

Occasionally, a trash sighting is more dramatic. Returning from a 1997 Los Angeles-to-Hawaii sailing race, for example, oceanographer Charles Moore came upon an especially-repulsive spread floating in the North Pacific Gyre. As described in "Trashed, Across the Pacific Ocean, Plastics, Plastics, Everywhere," Natural History, November 2003,

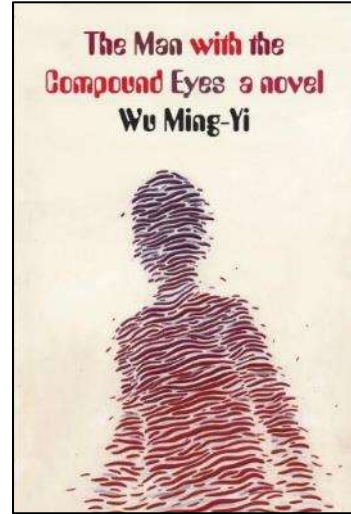
As I gazed from the deck at the surface of what ought to have been a pristine ocean, I was confronted, as far as the eye could see, with the sight of plastic. It seemed unbelievable, but I never found a clear spot. In the week it took to cross the subtropical high, no matter what time of day I looked, plastic debris was floating everywhere: bottles, bottle caps, wrappers, fragments.

From "A Comparison of Plastic and Plankton in the North Pacific Central Gyre," Marine Pollution Bulletin, December 2001, by C.J. Moore, S.L. Moore, M.K. Leecaster and S.B. Weisberg,

The potential for ingestion of plastic particles by open ocean filter feeders was assessed by measuring the relative abundance and mass of neustonic [floating] plastic and zooplankton in surface waters under the central atmospheric high-pressure cells of the North Pacific Ocean. Neuston samples were collected at 11 random sites, using a manta trawl lined with 333 μ mesh. The abundance and mass of neustonic plastic was the largest recorded anywhere in the Pacific Ocean at 334 271 pieces/km² and 5114 g/km², respectively. Plankton abundance was approximately five times higher than that of plastic, but the mass of plastic was approximately six times that of plankton. The most frequently sampled types of identifiable plastic were thin films, polypropylene/monofilament line and unidentified plastic, most of which were miscellaneous fragments. Cumulatively, these three types accounted for 98% of the total number of plastic pieces.

The press dubbed this floating junkyard "the Great Pacific Garbage Patch," a timely topic for fiction writers.

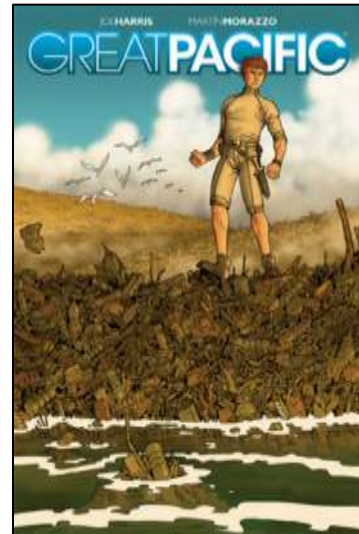
The Man with the Compound Eyes (2011) by Wu Ming-Yi, in which the protagonist finds himself floating amidst the Great Pacific garbage patch. Through ingenuity he manages to survive on the floating island of plastic until it collides with Taiwan.



Great Pacific, by Joe Harris, Image Comics, November 2012, a synopsis,

The series follows Chas Worthington, thrill-seeking heir to one of America's largest oil fortunes, who throws his plush life of wealth, power and pleasure aside when he decides to settle the infamous Great Pacific Garbage Patch and develop his own fledgling, independent nation upon it.

Chas will have to survive in the junk and waste-strewn dead zone, battling the elements, deadly marine life and animals mutated by the pollution, along with other threats which might challenge him for resources, including hostile island natives and even the United States Navy. He will build his new country, forge treaties with other ones and fund development and transformation of his own plastic island which recent estimates put at about twice the size of his home state of Texas.



As for why Harris sets his comic on the mythical trash island, he allows himself “license to be fantastic...and to shine perhaps a hotter spotlight on this than might be warranted.” His garbage island is equivalent to the mutating radiation of comic books of years past, an expression of fear about the future.

I'm Not a Plastic Bag (2012), by Rachel Allison, focuses on environmental activism, with photos of beach cleanups and entangled wildlife, but no photos of what the North Pacific Gyre actually looks like. As for why the author chose to portray the problem as a solid trash island,

I was in the story trying to figure out a way to visually communicate & make it [the floating garbage] a character, something that [the reader] could communicate with and be inspired by science. I hope that the fact that it's so whimsical communicates that it's not real, just inspired by the real thing... It speaks to both emotional ways and scientific ways give it a more balanced view.

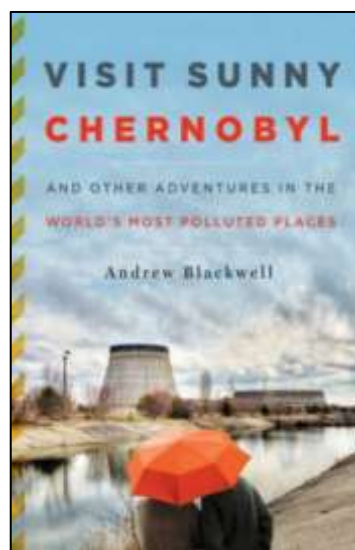


"The Eighth Continent: Searching for the Great Pacific Garbage Patch" in Andrew Blackwell's Visit Sunny Chernobyl (2012) explains the harm done by the floating-garbage-island myths.

You come to depend on the problem you're fighting. That we were so focused on finding the Garbage Patch in a concrete and spectacular form was tragic -- particularly because it isn't a visually spectacular problem.

The Great Pacific Garbage Patch doesn't actually look like much -- unless you're paying attention. The plastic confetti are invisible unless you scrutinize the surface of the water. And the millions of plastic bottles and laundry hampers and snarls of old fishing tackle are not clumped into a single mass. Yet the Garbage Patch is indeed a problem of vast scale and implications.

This conflict between the reality of the problem and its non-visual nature is at the root of the myth of the plastic island. We hunger for a compelling image to help us understand the issue



But depending too much on spectacular imagery can actually limit our understanding. We create islands where none exist, and then waste our time searching for them. We become Ahab's without a whale.

The Tsunami of 2011

The Japanese tsunami of 2011 swept some 5 million tons of debris into the sea, of which about three-quarters soon sank. Two million tons of debris are not inconsequential, of course, but the press was quick to hype the story. "Japan's 'Toxic' Monster Creeping towards U.S.," Fox News, November 1, 2013, by Maxim Lott,

An enormous debris field is creeping toward the U.S. in the wake of the massive earthquake and tsunami that shook Japan in 2011, killing nearly 16,000 people and launching 1.5 million tons of floating objects into the sea.

That most concentrated part of the junk field is easily broader than Texas and centered approximately 1,700 miles off the Pacific coast, between California and Hawaii, although the National Oceanic and Atmospheric Administration (NOAA) hasn't published more precise

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estimates. The agency estimates that the trash overall is scattered across an area in the ocean about three times the size of the continental United States.

The debris ranges from pulverized particles to entire docks that washed over from Japan, to intact boats, motorcycles, soccer balls, traditional Japanese flooring, and even some Japanese sea creatures never seen on the U.S. West Coast. "High windage" items reached the Pacific Northwest as early as winter 2011. Smaller debris is "sailing" here on the tides -- NOAA estimates that the widely scattered detritus may show up intermittently along shorelines for a long period of time, over the next year or more.

"We found an abandoned boat, a tire, and a tatami mat -- that's traditional Japanese flooring made of woven reeds," Stiv Wilson of the 5 Gyres Institute, which monitors plastic pollution out at sea, told FoxNews.com. Gyres was on an expedition to the "North Pacific Garbage Patch," an area with few ocean currents where tons of plastic garbage accumulates, and that's where he found the Japanese debris.

"We found a fishing vessel that was barely above water. It had Japanese characters on it and was made of fiberglass. On the front of the boat we found a rope that was ripped, so the tsunami wave probably hit it and tore it from dock. Then the wave must have hit it against something else, because the stern and the motor were missing."

"We have been seeing more and more," Glen Spain, Northwest regional director of the Pacific Coast Federation of Fishermen's Associations, told FoxNews.com.

The next wave of debris will likely hit shores soon, Chapman noted.

"Massive Toxic Japanese Tsunami Island of Trash Headed Toward U.S.," Buzzflash at Truthout, November 5, 2013,

As our numerous commentaries on Fukushima and its perilous implications to life on planet earth have indicated, the nuclear industry is high-risk. Anti-nuclear advocate Harvey Wasserman warned again of the nuclear power threat in a BuzzFlash at Truthout commentary posted today, "Pro-Nuke Scientists Should Go to Fukushima."

Now The Independent UK reports that an island of trash, some of it presumed toxic from the Fukushima radiation leaks, is floating across the Pacific, headed toward North America:

An enormous floating island of debris from Japan's 2011 tsunami is drifting towards the coast of America, bringing with it over one million tons of junk that would cover an area the size of Texas.

The most concentrated stretch -- dubbed the "toxic monster" ... - is currently around 1,700 miles off the coast, sitting between Hawaii and California, but several million tons of additional debris remains scattered across the Pacific.

If the rubbish were to continue to fuse, the combined area of the floating junkyard would be greater than that of the United States, and could theoretically weigh up to five million tons.

Even accounting for a bit of sensationalism in the projected size of the giant bobbing debris field, it is widely assumed that a significant percentage of the trash has essentially been soaked in radioactive water. In short, more radiation fallout from Fukushima is likely headed our way, and if so in gigantic fashion.

When the corporate world talks about globalization, this is not the kind of interconnectedness that they want people to think about: a noxious undulating junkyard floating toward us.

The Independent, November 6 2013, 2014,

The "toxic monster" is coming! Texas-sized floating island containing one million tons of junk from Japan tsunami drifting towards U.S.

Chapter 61 -- Look for a Trashcan

The most concentrated stretch of rubbish- dubbed the 'toxic monster' - is currently sitting between Hawaii and California

An enormous floating island of debris from Japan's 2011 tsunami is drifting towards the coast of America, bringing with it over one million tons of junk that would cover an area the size of Texas.

The most concentrated stretch -- dubbed the "toxic monster" by Fox News -- is currently around 1,700 miles off the coast, sitting between Hawaii and California, but several million tons of additional debris remains scattered across the Pacific.

If the rubbish were to continue to fuse, the combined area of the floating junkyard would be greater than that of the United States, and could theoretically weigh up to five million tons.

Among the numerous items consumed by the trash island are boats, houses, electrical appliances and consumer products -- all dragged away from the coast of northern Japan in the aftermath of March 2011's devastating tsunami.

Some of the debris may have already crossed the Pacific, however, with reports of Japanese fishing vessels washing up on the shores of Canada as long ago as winter 2011. If that proves to be the case, the levels of toxic junk already littering U.S. beaches is likely to be high.



Above left: An impression of a "Texas-sized" floating island of trash. Crunching a few numbers, such an island would require 22 trillion empty 2-liter soda containers floating side-by-side, more than a billion tons of plastic. Above right: "Radioactive waste from Japan arriving on American shores." Occasional debris did make it to beaches in the western Pacific, but little survived the 7000-mile Kuroshio (Japanese) Current arc to North America, none of which proved to be radioactive.

A factual report on the event was released by NOAA, but without the readership-garnering exaggeration of Fox News. From NOAA's Marine Debris blog, November 5, 2013,

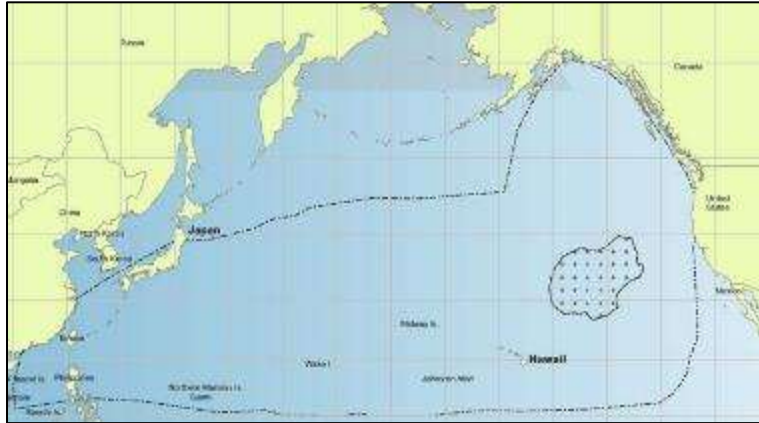
There is no solid mass of debris from Japan heading to the United States.

At this point, nearly three years after the earthquake and tsunami struck Japan, whatever debris remains floating is very spread out. It is spread out so much that you could fly a plane over the Pacific Ocean and not see any debris since it is spread over a huge area, and most of the debris is small, hard-to-see objects.

A significant amount of debris has already arrived on U.S. and Canadian shores, and it will likely continue arriving in the same scattered way over the next several years. As we get further into the fall and winter storm season, NOAA and partners are expecting to see more debris coming ashore in North America, including tsunami debris mixed in with the "normal" marine debris that we see every year.

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NOAA model showing a vast, but dispersed, field of debris from the tsunami north of the Hawaiian Islands and east of Midway Atoll.



Inland and Nearshore Accumulations

Better reflecting what might be envisioned as a "floating island of trash" are mats of buoyant refuse accumulated in rivers or bays, in some cases due to the waterbody's failure to flush itself, and in other cases due to wash from catastrophic flooding.

To the right, an oft-posted dramatic illustration purported to be the Great Pacific Garbage Patch, but as with the earlier photo of the elevated-island, incorrectly attributed.

The photo is from Manila Bay, where nearby garbage dumps are regularly wash into the water.



Corregidor



More than 150 million people live upstream from China's Three Gorges Dam and an unfortunate amount household refuse is dumped upstream. Three Gorges Corporation spends about \$1.5 million per year to clear the floating consequence.



A rubbish island three times larger than that at Three Gorges and 60 centimeters thick lodged under a bridge in Jilin Province.



Putting Trash to Use



A Nice Idea

Blissfully conceptual in nature, the Lady Landfill Scraper, an Eiffel Tower flipped on its head, is intended to float around the ocean, collecting garbage and converting it to fuel.



Conclusion

Are there floating islands of garbage?

Indeed there are regions of buoyant refuse, but only rarely would one call them proper "islands."

CHAPTER 62

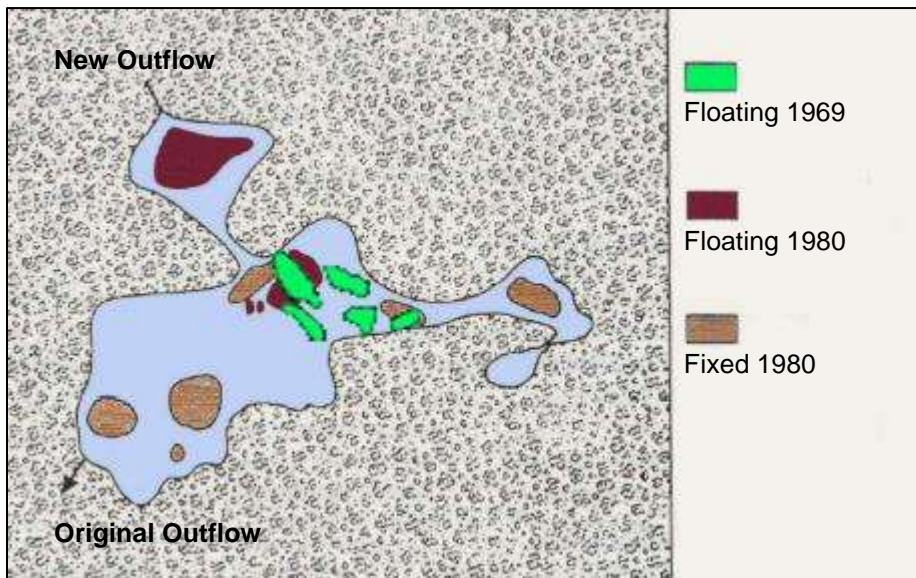
WATCH FOR KANGAROOS

While kangaroos are yet to be sighted on floating islands, if such a marsupial is in the vicinity of such an island, the island is surely in Australia, which means that there are more floating islands to visit.

Victoria

The state of Victoria offers a variety of floating islands, one being Pirron Yallock, once home to Australia's only floating peat islands.

Pirron Yallock was an intermittent swamp drained by a channel excavated at its northern perimeter in 1938. The drying encouraged the enlargement of a peat mat on the depression floor. Transformation from swamp to lake was dramatic, occurring in 1952 when rainfall was 61 percent above average. Peat that had been isolated by fire broke away from the rocky floor as the water rose, breaking into islands 2 to 30 meters in diameter. Roadway re-alignment in 1963 completely blocked the original southern outlet, further enhancing the depression's ability to retain water.





Two consecutive days, undated



20-minute interval, April 1980

The islands floated uninterrupted until a drought in 1982 lowered the water level sufficiently to ground the islands. The lake has further diminished since the 1990s, and the islands now seem firmly attached to the bed, unlikely to float again.

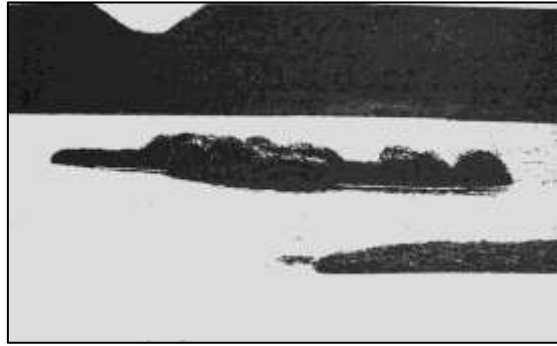
Chapter 66 discusses the local belief regarding island movement as a forecaster of weather.

"Floating Islands in Victoria," *Nature* 3, April 6, 1871, describes an encounter with an entirely different kind of floating island. The Gippsland lake system lies within in the palm-studded piedmont along the Victorian coast, separated from the sea by a narrow sandy ridge with a single navigable opening.

As one of the Gippsland Steam Navigation Company's Steamers was recently crossing Lake Wellington, the man at the wheel suddenly observed land right in the track of the steamer, and apparently only a short distance from the straits separating Lakes Wellington and Victoria. He called the captain's attention to the at-range sight, and on coming up close, the land was discovered to be a small island, about thirty yards in length by twenty broad. It was covered with a rich coating of luxuriant grass, and small trees, tea tree, and bush shrubs, appeared to be growing in profusion.

From what portion of the main land this floating island came, is of course, matter of conjecture, but it is known that a portion of the soil at Marley Point, on the southern shore of Lake Wellington, became detached recently, and floated miles across the lake with some twenty or thirty head of pigs aboard. As long as the wind drove it in that direction, the island drifted toward M'Lennan's Straits, but a change of wind brought it back again, after a three days' trip, within a mile of the spot from which it had broken away, We believe it is the opinion of the district surveyor, Mr. Dawson, that the area of the Roseneath Run, west of Lake Wellington, has been increased some twenty on thirty acres by the addition of drift islands.

Vegetated floating islands, most likely torn loose by storms, ran aground the lee-side bays of Lake Victoria during the 1969-70 filling, from time to time to be redistributed by strong winds and changes in water level.



Another variety of island, one appearing to be pure mud, can suddenly appear and almost as suddenly disappear, but though it does not float, per se, it's sometimes described as if it did. From "Lake Phenomenon, Island Suddenly Appears," Traralgon Record, May 22, 1928,

The extraordinary phenomenon which should prove of more than of slight interest to geologists has occurred in Lake Victoria at a place south of Pelican Point about nine miles from Payneville. As a result of a huge marine disturbance it is estimated that an area of about 2000 cubic yards of earth has been hurled up above the surface of the lake, forming an island 60 feet long and 30 feet wide. The new island which is about 30 feet off the foreshore on the south side of the lake is composed of slimy black clay and fibrous mater resembling decomposed marine matter, and stands about four feet cleat of the water. The lake at this point is about 12 feet deep. Two giant fissures extend from end to end of the island. From these fissures there is unmistakable evidence of escaping gas. Samples of the gas ignited when a math was applied to them.

In January last a disturbance of major proportions took place when a small island about three feet above the water was thrown up. This island has nearly disappeared.

"Jack-in-the-Box Island Reappears for Third Time," Evening Standard, December 28, 1936, remarks that the island of 1928 rose, sank, reappeared, sank again, and rose once more.

Such islands were active 50 years later, per "Meteorite, New Island Mystery in Victoria," West Australian, February 4, 1977, on the sudden rising of a 120 by 20 meter island of mud in Lake Victoria, attributed to marsh gas

New South Wales

Following intense rainfall in August 1998, a 144 hectare mass of peat floated from the swamp into the Wingecarribee Reservoir, as reported in Wingecarribee Swamp and Special Area Plan of Management 2000,

Some 200 mm of rain fell in single day in 1998. Similar events had occurred previously without serious consequence, but in this case, increased mining of peat had allowed the peat to dry. In addition, there was a physical weakness in the peat, along the line where dredging had occurred. This combination of circumstances caused the relatively dry peat to "float like a cork," as groundwater upwelled from the Kangaloon Range above the swamp. The body of peat floated and in the process dislodged the dredge, which itself floated down through the swamp and into the Wingecarribee Reservoir.



Floating islands of dislodged peat and vegetation in Wingecarribee Reservoir



"The Barrage" - a wire and steel containment designed to keep the islands from blocking the sluice gates.

Patricia Vorst discusses the formation of peat islands in Thirlmere Lakes in Thirlmere Lakes, N.S.W.: Geomorphic Environment and Evolution (1974).

*The islands vary in diameter from 0.5 meters to about 5 meters, with thicknesses of not more than 1 meter. Surface appearances are variable; some bear the remains of aquatic sedges and their rhizomes, and roots, stems, and sometimes the whole plant, of the water lily, *Brasenia schebri*; others have flat, bare surfaces, while still others are colonized by herbs, grasses, sedges such as *Juncas sp.*, and swamp plants such as *Polygonium strigosum*. The islands exhibit an "iceberg" effect, whereby the greater proportion of their mass (up to 95%) is below the water surface, but in spite of this they are relatively easily moved about.*



Peat Island with Reed and Water Lily Remains



Reed Barriers on Peat Island



Flat, Bare Peat Island



Vegetated Peat Island

The islands tend to congregate at the northern and southern ends of the lakes, along the line of greatest fetch of the wind.

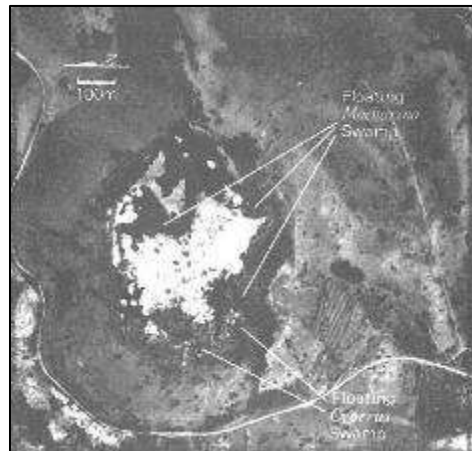
Peat islands of different ages suggest periodic lake level fluctuations. Exposed peat on the lake margins suggests fluctuations of 2 or 3 meters. Vorst notes that "forest species on the perimeters of the lakes are becoming submerged," indicating that the lakes were at their highest levels in some time. Tree stumps beyond the reed margin in water up to 4 meters deep speaks to earlier conditions.

Surrey Jacobs, et. al. mention floating islands up to 15 meters in diameter in "*Ludwigia peruviana* (Onagraceae) in the Botany Wetlands near Sydney, NSW," *Australian Journal of Marine and Freshwater Research* 45,1994.

Queensland

A littoral floating vegetation mat at Lake Euramoo, a volcanic crater lake, is comprised of waterdropworts and the pan-tropical wetland fern *Dryopteris gongyloides* with some *Eleocharis equisetum*. This mat forms part of a marginal zone up to 30 meters wide and has likely persisted for several centuries.

Bromfield Swamp, North-East Queensland



Northern Territories

Mats suspended over free water of up to 3 meters deep on billabongs on the Finnis River floodplain extend as far as 65 meters from the shore and show distinct zonation of plant assemblages. The mat vegetation is low in stature but the substrate of living and dead plant material can reach 130 centimeters.

Recent loss of such mats has been dramatic. Approximately 30 percent of the Finnis was covered by floating grass mats in 1963/64, whereas in 1978, the extent was only 5 percent. The loss appears to be largely attributable to the introduced feral water buffalo, and, to a lesser extent, cattle. Both species graze on the young Phragmites, though trampling might be more

destructive. A victim of the process is the crocodile, whose nests float away with the surrounding mat.



A billabong covered by grass. The center-right, lighter area is free floating pistia in various stages of grass colonization



Infestation on the Finnis River

CHAPTER 63

IF IN NEW YORK, DON'T LOOK FOR THE EMPIRE STATE BUILDING

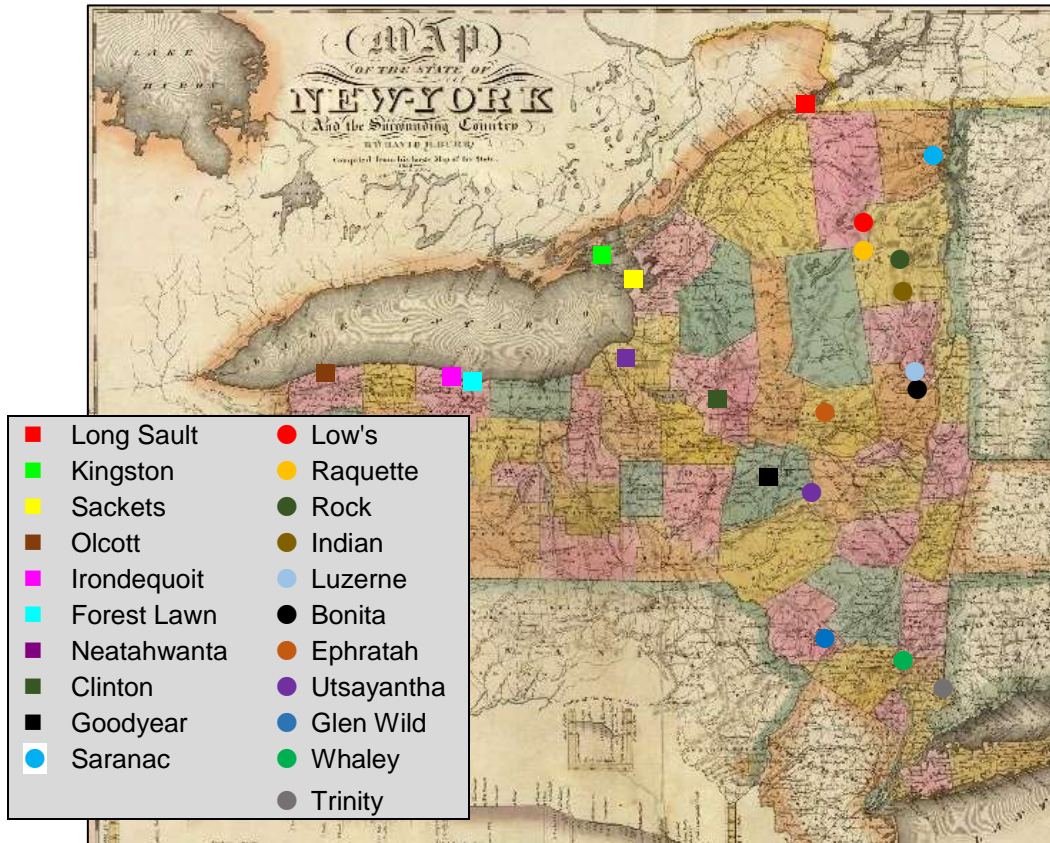
New York is not about the Empire State Building. New York's a diverse state, inundated with floating islands.

New York visits from other chapters,

Picnickers	Chapter 68,
E.H. Harriman's Property	Chapter 33,
Long Island and Manhattan	Chapter 16
Raquette Reservoir	Chapter 82.

And there are so many more! New England's peat provides the material. Damming of rivers promotes the loosening. Small-town newspapers preserve the record.

We'll need a map.



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Glen Wild Reservoir

Not to be confused by the reservoir of the same name which supplies New York City, this Glen Wild was flooded in 1930 by the damming of Great Sacandaga Lake above Amsterdam.

"City's Floating Isle. This Freak Of Nature May Be Dispensed With," Amsterdam Daily Democrat and Recorder, January 20, 1902,

When the new reservoir was building, a question arose as to what disposition should be made of this mass of refuse in the center of the region it was proposed to flood. By some it was believed that it was of sufficient solidity to remain attached to mother earth and never cause trouble, hence nothing was done. When the great dam was completed and the reservoir began filling, the island took and has since maintained a position on the surface and the trees which were supposed to hold it in place either gave way or dragged over the bottom of the lake, for the island has now shifted its position and is anchored, whether temporarily or otherwise is not known, along the east shore. There is little likelihood of the floating island ever causing any damage to the reservoir, its dam and embankments, but the decaying timber of which it is largely composed, discolors the water, and while this has no deleterious effect, it is deemed advisable to remove the mass if possible.

Superintendent Snell is of the opinion that the island, which is believed to be about six feet in depth, can be torn apart and removed, but it is realized that this will be a herculean task and will cost many thousands of dollars.

"A Floating Island. Freak of Nature in the Big Amsterdam Reservoir at Glen Wild Which Is Causing Trouble.," Gloversville Daily Leader, January 21, 1903, describes the island.

A six acre heterogeneous combination of decaying timber, forest leaves, shrubbery, moss, etc., which has risen to the surface of the great artificial lake

"Plenty of Water at Glen Wild, the Source of Amsterdam's Supply," Amsterdam Evening Recorder and Daily Democrat, June 9, 1905,

A small floating island of vegetable growth in Glen Wild Reservoir -- the lone survivor of a diminutive archipelago -- was consigned to destruction at the hands of the ruthless dynamiter.

"In Common Council (Official Proceedings)," Amsterdam Evening Recorder and Daily Democrat, July 17, 1912 public works committee,

We would recommend the removal from the Glen Wild Reservoir of the floating Island therein. Its continued existence constitutes a menace and it should be removed in its entirety.

Lake Luzerne

Richard Weston, A Visit to the United States and Canada In 1833: With a View of Settling in America, including a Voyage to and from New York (1836),

There was on my nephew's property a large lake of some miles in extent, with many islands studded in it, one of which was a floating island; sometimes appearing here and sometimes elsewhere. He remembered its formation, which was occasioned by a number of spars and saw-dust from the saw-mills on the two streams that emptied themselves into the lake, being collected together. This island had increased in magnitude till it was above a mile in circumference; trees were on it of considerable height, and the whole island covered with thick brushwood and impervious.

The margin of his kind of floating island was sandy and gravelly. I used to take the boat and spend hours on it, acting the part of another Robinson Crusoe, and had nearly formed an acquaintance with an otter, which used to come and look at me without molestation.

Lake Bonita

"Mount McGregor," Harper's Weekly, July 14, 1883,

Of the lakes, the largest and most beautiful is Bonita, a mile west of the hotel, and reached by a heavily shaded road. The lake is encircled by forest-clad hills, and on its sparkling surface rest a number of the curious floating islands or bogs common to most Adirondack lakes. They are covered with sphagnum mosses, which late in the season rival the autumn foliage of the trees in the richness and beauty of their red, yellow and purple tints.



1883 and Today

Saratoga: Winter and Summer (1885) by Prentiss Ingraham,

Lake Bonita contains several curious floating islands, anchored by the tenacious roots of long weeds. When there is the slightest breeze, these miniature islands sway gently to and fro, as if moved by some magical power, and one can easily people them in imagination with a race of fairy spirits.

"Outlooks and Trails," Mt. McGregor Optimist, May, 1924 mentions the floating islands in Lake Bonita.

The lake has a sandy bottom, is rimmed on three sides with woodland, and its "floating islands," which still may be seen along the southern shore, were an attraction to boating parties when Mount McGregor was enjoying the height of its social splendor in the late years of the nineteenth century.

Goodyear Lake

"Are Removing Island," Cooperstown Glimmerglass, August 5, 1915,

Colliers Light, Heat & Power Company Busy at Goodyear Lake

The floating island which has been in Goodyear Lake for several years and which recently floated up against the dam much to the inconvenience of the Collier's Light, Heat and Power Company is now being cut into sections and a considerable portion has been drawn around the point into a bay where it is being anchored adjoining lands owned by the company.

Another part has been drawn farther up the lake, although its more definite disposition has not been announced. It is believed that in a short time the entire island will be safely removed from the zone where it might cause damage to the plant and the dam.

"Lights Went Out When Floating Island Hit Colliers Dam," Cooperstown Glimmerglass, July 6, 1919,

Otsego Lake has its sunken islands and Goodyear Lake, where the electric power for the village of Cooperstown is generated boasts of its floating islands. One of these floating islands becoming tired of its native haunts Sunday afternoon cruised out of a little bay and started over

the dam on its way to Binghamton, causing the Cooperstownians to use bad language during the evening as they groped their way about the dark houses and streets.

At one o'clock an island floated up in the vicinity of the dam and the dirt clogged up the pumps at the plant, necessitating the shutting down of the machinery. The pumps were taken apart and late in the afternoon

Monday morning at an early hour the plant at Colliers was again shut down while the pumps were taken apart and the dirt removed. As soon [as the water recedes an effort will be made to draw the island from the dam and anchor it in some convenient spot where it will be unable to cause the residents of Cooperstown any further trouble.

Lake Neatahwanta

"A Floating Island. Curious Phenomenon Witnessed at Lake Neatahwanta Yesterday Afternoon." Oswego Daily Times, March 26, 1903,

A curious sight was witnessed by many persons yesterday afternoon. A piece of land had broken loose from the bank on the west side of the lake and impelled by the strong wind had been blown across the water on the east side of the lake a short distance south of Steams' Hotel. The land was about 125 feet in length and about 75 feet wide and was covered with hundreds of small trees, and some large trees. Following this, some seven other pieces of land, each being about 25 feet long. It is a little over a mile from the east shore and this large floating island was blown over in about an hour.

"Part of Farm Sails Away," Utica Herald Dispatch, March 30, 1903,

When first discovered it contained half an acre, but considerable was lost on the journey. The island was covered with small trees from ten to twenty feet high. The theory is that the high water had worn a channel around the mainland and the high wind detached it from the bank, the trees serving as sails.

"That Floating Island. Hundreds of People Witness Curious Sight on Lake Neatahwanta -- Various Fairy Tales Started" Oswego Daily Times, March 30 1903,

Several amusing stories are connected with the floating of the land over the lake. Some people had started the story that there were a number of cows on it; that there were also cords of split wood piled on it; that there was a little log hut on the island, etc. All these stories created much amusement but were entirely dispelled when the island was seen.

Nothing probably will be done to remove the island, but when the water goes back from the land which is flooded it is believed by that time that the trees will have taken root and it will then be a hard task to remove them from the east shore.

"Floating Island in Lake Neatahwanta. Residents along Shore Greeted with a Unique Spectacle -- Mystery Cleared," Utica Herald Dispatch, June 23, 1908,

A good sized island, which had apparently been formed during the night, and located at about the middle of Lake Neatahwanta, met the sight of the early risers in the vicinity of the lake Saturday morning. The island was about three-quarters of an acre in extent and was completely covered with underbrush and small trees.

At first the observers were baffled, but it was soon noticed that the island was not a fixture, but was slowly moving toward the eastern shore of the lake, where it ran aground about 10 o'clock.

It was found that the island had formerly been a part of a peninsula projecting into the lake at North Bay, and the high water had evidently lifted: it to such an extent that the connection with the shore was broken and it floated away before the wind.

The island seems to be formed of peat, in which the roots of the trees and shrubs are firmly imbedded, and while light enough to float, is so formed that the investigators who reached the

island in boats as it approached the shore were able to land and walk around apparently without danger of a ducking.

Trees of Lake Neatahwanta's floating island

"Made a Floating Island," <u>Syracuse Herald</u> , June 21, 1908	<i>Trees of considerable size and number remained in their upright position during the transit and seem as soundly rooted as their kind on that portion of terra firma which has not shown migratory tendencies.</i>
"Floating Island Keeps Moving," <u>Oswego Daily Times</u> , July 10, 1908	<i>The trees and shrubs with which the island is covered do not seem to suffer because of the wandering habits of the mass in which they are imbedded and are still green and to all appearances, growing.</i>
<u>Fulton Times</u> , July 18, 1908	<i>The freak is heavily timbered and it may be necessary to blow it up with dynamite to remove the annoyance.</i>

Fulton Patriot, July 16, 1931,

We have been informed on what would appear to us as good authority that the removal of the island which appeared in Lake Neatahwanta a few years ago as a floating island and which is now lodged at the outlet into Tannery Creek, would be means of creating a natural current cleaner for the lake and that, then, a beautiful bathing beach along the park shore could be created, thus forming swimming facilities for the children.

"**Lake Utstayantha**," The Even Body's Album, A Humorous Collection of Tales, Quirks, Anecdotes and Facetiae, November 1, 1836,

So prone are we not to trace things to their source that few are to be found who know that the river Delaware takes its rise from the small and beautiful lake above named.



It is noticed by no geographer, except Morse, in some of his early editions:

It is an isolated sheet of pure water, surrounded by hills and mountains, supported by numerous cold springs, from many of which, situated in the bosom of the lake, the water ascends with a boiling motion, throwing up white sand, mixed with decayed wood and vegetables.

One of these, near the middle of the lake, is of great depth, the bottom not being reached by a lead and line one hundred feet long, it contains a floating island, attached so slightly to the bottom, that pieces several yards square, have been cut off and drawn away by the aid of a small boat.

"Another Floating Island," Farmers' Register, November 30, 1842, describes an island near **Clinton**, the reference to Flat Rock suggesting nearby Cranberry Lake, but an entirely different Cranberry Lake than the one viewed from the Harriman Mansion (Chapter 33). "Cranberry" tends to be frequent in the naming of geographic formations associated with floating islands in the eastern United States.

The lake in which the island is found lies in a deep gorge or rotten gulf of high table mountains, equally noted through the surrounding country for its huckleberries and its rattlesnakes, and

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called the Flat Rock... A number of pines were growing on it at the time of the visit of Mr. Wood, some of which were five or six inches in diameter. The surface is covered with the productions peculiar to marshy grounds, and though the soil is so soft that a sharpened pole may be thrust completely through, yet stray cattle have been discovered on it at various times.

Strictly speaking, it is not an island, but a peninsula, and this will explain the apparent inconsistency contained in the last sentence. However, that the peninsula, or island, (whatever the reader may please to term it,) floats, and is disconnected from the bottom, is demonstrated from the fact, that the wind will cause it to change its position, varying some days many rods from the preceding. Were the isthmus, that acts as an anchor, severed, it would undoubtedly float on, with trees for sails, a complete floating island.

"Scale Insects of Importance and List of the Species in New York State," Bulletin of the New York State Museum 46:9, June 1901, describes **Little Bog Pond**, near Saranac.

This little pond was a woodland gem. The picture of it presented herewith gives but a poor idea of it; for the fine coloration of fringing vegetation, of forest background, and of water and sky are necessarily absent from the picture.

Its vegetation showed a beautiful zonal distribution. Farthest out was the zone of the very abundant yellow water lilies. Next came a very broad zone of sphagnum, floating at its outer edge over water 5 feet or more in depth, with here and there a detached and floating island.



Treading on the floating island of **Low's Lake**, February 2013,

Walking on the "floating island" in the middle of Low's Lake- a wilderness canoe area in the Adirondack Park. The thick growth of shrubs and small trees broke away from the upper part of the lake in the 1800s and has floated east with the wind.



During the early 20th century Mohawk Hydro-Electric Company dammed at the outlet of Peck's Pond near Ephratah, raise the water level by 20 feet to form **Peck Lake**. Stumps and scraps from the timber cutting continued to float around the lake for years. A half-acre of sod and brush broke

loose from the bottom and became a floating island which moved at random, eventually attaching to the shore just east of Rock Island and still visible into the 1950s.

Whaley Pond resulted from a damming in the late 19th century. From James Smith's History of Dutchess County, New York (1882),

Whaley and Little Ponds, in the western part of the town, form the source of the Fishkill. The former is the largest of these ponds, and contains some natural curiosities, in the shape of floating islands, densely covered with verdure.

Whaley Pond, 1911



Whaley's floating islands no longer exist.

"Of General Interest," Decatur Weekly Republican, January 29, 1885, on an intermittent floating island in **Trinity Lake** and the locals' interest, or lack thereof.

Situated one and a half miles north of Poundridge is a pretty little sheet of water called Trinity Lake. It is the source of supply for Stamford, Conn., fourteen miles away. There is a singular phenomenon connected with this lake which is not generally known, except to a few residents of this locality. It is what is called a floating island, a good-size body of land, which has for several years appeared at regular intervals near the center of the lake, and, after remaining upon the surface of the water for several days, sinking again to the bottom, about forty-five feet. No one has yet taken the trouble to investigate the phenomenon, and the country people have become so accustomed to it that they think little about it.

Indian Lake, formed in 1845 when a loggers' dam united three natural lakes and enlarged in 1861 and 1898, was reported to have floating islands, but once more, they are only a memory.

Rock Pond was created with the damming of Lake Durant to impound water for the rafting of logs down the Hudson. The flood-killed trees were cleared by the Civil Works Administration in the 1930s and a new dam was constructed by the Civilian Conservation Corps. From Victor Schmidt's "The Floating Island," Adirondack Life (January-February 1985), on the pond's floating island,

This past July we found it at the bridge again, but near the opposite end. It gets around.

And its travels are beginning it take a toll; it seems to be getting smaller. I suppose pieces of it break off from time to time and float away. Even so, it is still more than 30 feet long and 15 feet wide -- a floating miniature jungle of plants from sphagnum moss to bog asters. And among the plants we found pearly shells leftover, I suspect. from a raccoon's clam dinner.



1985



Today

St. Lawrence River

Clinton Courier, July 26, 1956,

A gantry crane operator at Long Sault dam reported a "body" floating downstream.

Safety engineers on the St. Lawrence project and state troopers of Massena searched in vain and stated the object may have been a small "floating island." Many of these can be seen in the river since the start of construction, ranging in size from two to three feet long, some even carrying trees along with them.

"St. Lawrence River Ripples," Rome Daily Sentinel, September 24, 1878,

A floating island passed down the St. Lawrence the other day during a storm. It contained nearly two acres of meadowland, with hay in the winrow and some bunched up ready to draw in. It measured seven feet in thickness.

Lake Ontario

"Floating Island Will Be Removed from Olcott Harbor," Tonawanda News, July 12, 1973,

Technicians from the U.S. Corps of Engineers this morning were surveying the work to be done in Olcott Harbor to remove a "floating island" which is clogging the mouth of Eighteen Mile Creek.

A spokesman for the Buffalo District Corps of Engineers said funds have been approved for the job and bids will be accepted "probably next week" to begin work the next week on removing the "island."

The "floating island" is vegetation that apparently broke loose from a marsh upstream in Eighteen Mile Creek and floated down to Olcott Harbor, he said.

Although the work will be awarded to a contractor, the U.S. Corps of Engineers will oversee the entire operation, according to present plans.

Plans also call for removing the island by truck to a dump site to be provided in the Town of Newfane.

Chapter 53 mentions the hoisting of Old Glory on an island floating off of Piltneyville, approximately the same location as "Tale of the Comet on Irondequoit Bay," Greece Press, July 16, 1943.

The most peculiar thing happened at the bay last Friday that this writer has seen happen there in some time. A floating island of cattail 300 feet square blew off the great cattail field at the north end of the bay and came floating up bay, lodging in front of the cottages just north of the Birds and Worms. The cottagers did not like this so Sunday afternoon about 25 row boats with

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Chapter 63 -- If in New York, Don't Expect to See the Empire State Building

a few outboard motors mixed in, put their noses against it and pushed it until they got it started with the help of a south wind. Then down the bay it came past Point Pleasant and the Algonquin Yacht club. People came out with cameras to get a record of the strange sight.

Skipper Sweet had his buoy for mooring his boat carried away by this "Floating Island" and had to bring his boat up to the club for mooring. Skipper Mahon put his yacht in the front yard of his former home. The Bay was littered with roots from the "Floating Island" and racers from the Algonquin had to keep removing them from both the rudder and centerboard.

Baldwinsville Gazette Farmers Journal, June 21, 1904, takes place near Webster.

A floating island, 40 x 44 feet, nearly covered with rushes and weeds, has drifted in from Lake Ontario at Forest Lawn. The origin of the wanderer is unknown. Many, however, think it is a piece of Canada, which has been torn loose from the mainland by a storm.

"Watertown-- Island Voyage," Syracuse Herald Journal, August 13, 1951, regarding Sackets Harbor,

A floating island in the eastern Lake Ontario, especially near the shores of Sackets Harbor and vicinity, is no uncommon sight these days. The other day one was detached from low land near Dexter, journeyed down Dexter Bay and moved past Sackets Harbor. The island was held together by a mass of roots. Others have also been seen in that vicinity this summer.



In A Treatise on Limnology (1957-93), George Hutchinson mentions a 100-meter-long floating island in Kingston Harbor, around 1951. It's Canada, not New York, but just across border.

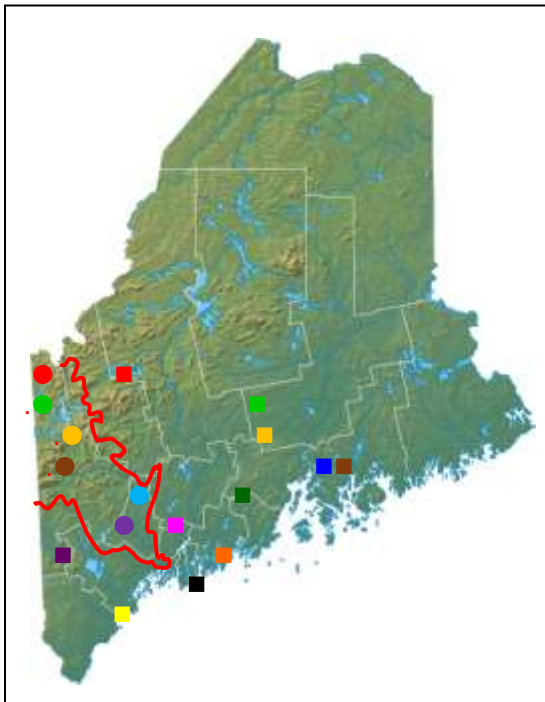
Reflection

Who needs Times Square or the Radio City Music Hall? We've enough to see with New York's floating islands.

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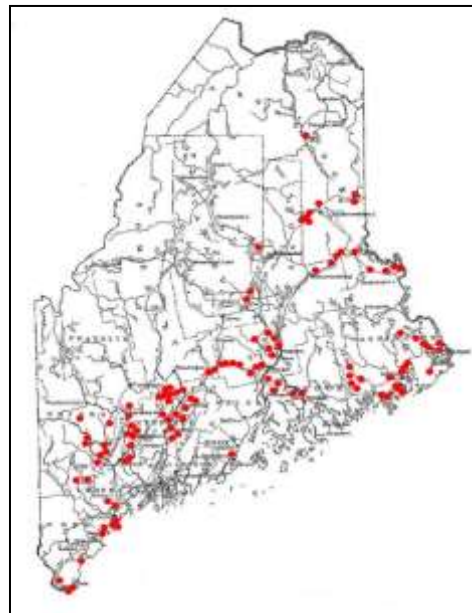
CHAPTER 64 REMEMBER THE MAINE

We harken not to William Randolph Hurst's newspaper-selling battle cry in homage to a warship, but to an American state resplendent in floating islands, for which we provide a map showing only the ones discussed, a fraction of the complete count.



■ Flagstaff	Androscoggin Basin
■ Waasoockeag	● Parmachenee
■ Corundell, Ch. 59	● Umbagog
■ Ellsworth, Ch. 59	● Norway
■ Toddy, Ch. 59	● Annabessacook, Cobbossee
■ Liberty	● Sabattus
■ Eddington, Ch. 32	● Lewiston
■ Rockland	
■ Winnegance	
■ Highland	
■ Kennebunk	

Maine's floating islands tend to be peat formations. The map of tested peat sites from The Occurrence and Uses of Peat in the United States, United States Geological Survey Bulletin 728 (1922), by E.K. Soper and C.C. Osbon, shows peat deposits in the eastern and southern parts of the state. The report adds, however, that the northern and western regions contain many uninvestigated deposits in heavily-forested swamps. Recent assessments suggest that peatland constitutes 3 or 4 percent of Maine's total land area.



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Androscoggin Basin

The Androscoggin basin snakes into New Hampshire, and then back across Maine. The basin's collection of floating islands has been well noted over the years.

Farrar's Illustrated Guide Book to Rangeley, Richardson, Kennebago, Umbagog, and Parmachenee Lakes (1880), by Charles Alden and John Farrar, Lake Parmachenee,

Toward the northern end, and above Indian Field Point, there is a chain of three wooded islets extending down in a line; and above these there are numerous curious floating islands, some of an acre in extent, which rise and fall with the lake surface.

Lake Umbagog, its size markedly increased with the construction of a dam in 1853, straddles the New Hampshire-Maine state line. Floating Island National Natural Landmark, an 860-acre spread of floating peat, lies in Harper's Meadow, where the lake empties from its northwestern corner into the Androscoggin River.



Harper's Meadow

William Brewster's "The Birds of the Lake Umbagog Region of Maine, Part 1," Bulletin of the Museum of Comparative Zoology, 1924, estimated the floating bog to be 100 acres, but as shown by photography over recent years, the coverage changes rapidly.



May 1999

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September 2003



October 2007



August 2008



September 2009

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November 2011



September 2013

Downriver, tall tamaracks and conifers, stand above remnants of shore-line timber booms, evidence of an era in the 1800s when the Androscoggin was jammed with 2,500-chord islands of fallen timber bound for the mills.

Brown Company
woods operation,
Berlin, New Hampshire



Further downstream, Rockland County Journal, August 2, 1890,

There is a real floating Island in Norway Lake, Me. It has an area of one and one-eighth acres, formed of a quagmire made up of a mass of roots, weeds and fibers and a growth of small trees. It has for years been a breeding place for hens, ducks and other birds.

"Anybody Want to Buy an Island?" Lewiston Evening Journal, June 8, 1978,

There's a stray island parked on Charles Phillips' sandy beach.

Phillips would like to find out who owns the half acre of reeds that floated onto his property, carrying redwing blackbirds, frogs and turtles on its back.

It's pretty hard for him to toss a fishing line into Annabessacook Lake with a 150-by-100-foot swamp in the way. A lot of islands pry themselves loose and float around the tranquil lake nestled in the verdant marshland about 10 miles west of Augusta.

"But nothing this large. They've always been fairly small -- 10 or 20 feet in diameter. They were nothing compared to this. This is gigantic ... Heck, this is big enough for a house lot," said Thomas Gordon, executive director of the Cobbossee Watershed District.

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'No one in state government is charged with taking care of a problem like this. No one is assigned the job of rounding up stray marshes,' he said.

"Balloons Not All That's Afloat," Star Journal, August 24, 1996,

The largest he had ever seen measured about 50 feet by 20 feet on Annabessacook Lake in Winthrop.

"Slate Plucks Floating Land Mass from Lake," Sun Journal, October 22, 2005,

A floating excavator tore apart a football-field-sized floating island Friday that was threatening to flood Route 126.

The island was a mass of peat, soil, bushes and roots that appeared to have broken off from alongside the Cobbosseecontee Stream, according to Herb Thomson of the Maine Department of Transportation.

State crews made an impromptu barge lashing two boats together to hold a road excavator. The barge slowly began ripping the mass of vegetation apart, letting pieces float downstream where they were plucked from the stream by a crane and trucked away.

"We wouldn't normally become involved in something like this, but it did pose a serious threat to one of our transportation facilities," Thomson said.

The pieces removed from the river were taken to a local farm and ground up. They'll be used as mulch fertilizer.

"Island Floats," Lewiston Journal. September 1. 1988

Homeowner Adrienne Plamondon, 80, expresses her concern over the floating island, in the background, that has appeared in front of her lakeside home on Little Cobbossee Lake in East Winthrop yesterday. A local official said the one-acre land mass is apparently a chunk of wetland that became detached from the mainland and is moved when the wind picks up.



"Floating Island in Androscoggin," Happy Days: A Paper for Young and Old, September 4, 1909,

One of the peculiar relics of the high water on the Androscoggin came ashore on the Lewiston bank of the river above the falls Friday. It was a regular floating island which came drifting down and into shallow water. It was of quite respectable size and on it were trees, several of them being described as being six or eight feet in diameter.

"Chunk Breaks Away From Floating Island in Sabattus Pond," Sun Journal, July 8, 2013,

The land in and around Sabattus Pond sometimes gets restless.

On the northeast side, a large clump locals call the Floating Island sometimes undergoes a transformation. Little pieces break away and head across the pond like birds leaving the nest.

"Some of those chunks are small; some of them are quite large," said Royce Coburn, who witnesses the phenomenon from his home on the west side of the pond. "This one is one of the largest I've seen."

Chapter 64 -- Remember the Maine

Indeed, the chunk that came drifting across Sabattus Pond on Friday afternoon looked like a tiny continent roaming all by itself. The mass is mostly wild grass, with roots dangling below the water, Coburn said.

Coburn estimated the transient island to be 30 feet long and perhaps 15 feet wide. It's large enough to put up a lawn chair and maybe have a barbecue, but Coburn said he's never seen anyone try.

"Balloons Not All That's Afloat," Star Journal, August 24, 1996

There was the Loch Ness Monster, the Bermuda Triangle and now the mysterious floating island on Sabattus Pond.

Residents along the pond awoke this week to discover what appeared to be a large and decidedly smelly chunk of land floating about.

Pat Powers, who is from Walpole, Mass., and owns a camp along the pond, initially spotted the mossy mass about 400 feet away Thursday morning.

The island, which measured as big as 50 feet by 50 feet according to some neighbors, floated right by Powers' camp, she said.

Tim Concannon, Powers' son-in-law, had to retrieve his dog, who hopped onto the mushy mass in pursuit of what Concannon thought might have been a small animal.

Finally, it came to a halt at a nearby beach, but, by morning, there was no trace of it.

According to St. Pierre, this isn't the first time such an island has appeared on the waters of Sabattus Pond.

About 15 years ago, one resembling an actual island with trees, grass and stumps floated right past her camp



Other Sites

And that's just the Androscoggin drainage a small portion of Maine. We've many other places in which to look for floating islands.

Maine Farmer, February 8, 1873,

The Reporter says that there is a floating island in Flagstaff Pond, which, from its appearance, must contain several acres. The drivers of lumber are obliged to hitch to it to prevent its floating down and obstructing the free outlet of the pond, when the logs are driven past the village of Flagstaff into the Dead River. Trees of considerable size are growing upon the island and it is really quite a curiosity. It is supposed to have broken off of a large bog that extends across the upper end of Flagstaff Pond.

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Sheboygan Press, December 19, 1917,

A section of land became detached from the shore at Dexter, Me., during recent severe storms and has become a floating island in Lake Waasoockeag. The land bears many trees.



Floating Island on Little Lake Waasoockeag

"Maine's Floating Island," North Adams Transcript, August 8, 1899,

The town of Liberty has a floating island which is quite a natural curiosity. The island contains about 100 acres. It does not float around for the reason that there is not space for it to do so, but it rises 10 or 12 feet during the freshets of fall and spring and falls back to solid pasture land during the drought of summer. Spruce trees 50 feet tall grow upon it.

"Allen Afield: Choose a Favorite -- or Several -- from Central Maine's Bass Ponds," Portland Press Herald, June 12, 2011, deals with the same.

This water has floating sphagnum islands that grow carnivorous plants, exciting for an amateur botanist. I can cast a fly close to the edge of these islands while gawking at pitcher plants, growing a couple feet away.

When a good-sized man gets onto one of these floating masses for a closer look, the ground sinks around the feet ever so slowly. If folks aren't paying attention, water eventually rises over shoes or even 10-inch boots.

History of Thomaston, Rockland, and South Thomaston, Maine (1865) Cyrus Eaton

As late as 1839, during a violent storm of rain and wind which occurred Aug. 31st, a point of land containing about half an acre, covered with a thick growth of cat-tail flags whose roots were usually a foot or two submerged, by some means became detached from the adjoining land at

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the upper part of Wheaton's mill-pond, and floated majestically down the same amid the wonder and admiration of the crowds which collected in spite of the rain to witness the novel scene. This floating island finally brought up against the land on the north of the bridge, after a voyage of about a quarter of a mile, and remained there some time an interesting object much frequented by delighted boys and curious observers.

"A Week on Five Islands (2006)", S.D. Roberts, a 2013 web posting describing Winnegance Creek.

An odd observation was the "floating islands". As I pushed off one of these approximately 8' in diameter mounds of dirt, grass, and cattail, I was shocked when it moved. The girls could have easily used one of these as a raft and it's likely my weight would have been supported as well. When I later asked the proprietor of the rental shop about the ones on Winnegance Creek, he explained how he spends a lot of time rounding up and corralling them so they don't block up the waterway. He spoke of them as a farmer would of woodchucks and crows.



"To Dynamite Floating Island at Kennebunk," Biddeford Daily Journal, March 12, 1937,

Several dynamite blasts and three days' work will be required by the road crew to dislodge a half acre of bushes and refuse which washed away from the margin of the Mousam River and banked up against the bridge on Route 7, in Sanford.

The "floating island," so-called, was a peculiar formation, Selectman Roscoe C. Butler stated last night, formed of waste materials from the mills, such as sticks, refuse, bushes and cat-o'-nine-tails. The state road department agreed to pay one-half of the expenses necessary for the work.

The Day Book., September 25, 1916,

A piece of bog in the western cove of Highland Lake, Bridgeton, Me., about large enough to make a little island, has broken off and is floating around the head of the lake. Trees from 12 to 14 feet are growing on this floating island and it is proving a menace to the many craft on the lake.

Maine's National Natural Landmarks featuring bogs, and year of designation


Appleton Bog Atlantic White Cedar Stand, 1984

Well-developed hummock-and hollow peatland supporting virgin Atlantic white cedar.



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<p>Carrying Place Cove Bog, 1989</p> <p>Coastal raised plateau bog. one of only six such fully-featured peatlands in the United States.</p>	
<p>Colby-Marston Preserve, 1973</p> <p>Sphagnum mat exceeding a thickness of 40 feet in deep kettle hole.</p>	
<p>Crystal Bog, 1973</p> <p>Crystal bog, an undisturbed, sphagnum bog. Geologic features, including several eskers are characteristic examples of glacial formations.</p>	
<p>No. 5 Bog and Jack Pine Stand, 1984</p> <p>Diverse boreal vegetation associations and well defined, surficial glacial features.</p>	
<p>Orono Bog, 1973</p> <p>Classic, northern sphagnum bog having flora zonation from lowland and bog to upland forest. Floating boardwalk.</p>	
<p>Passadumkeag Marsh and Boglands, 1973</p> <p>Bog and marsh communities partially bounded by eskers.</p>	

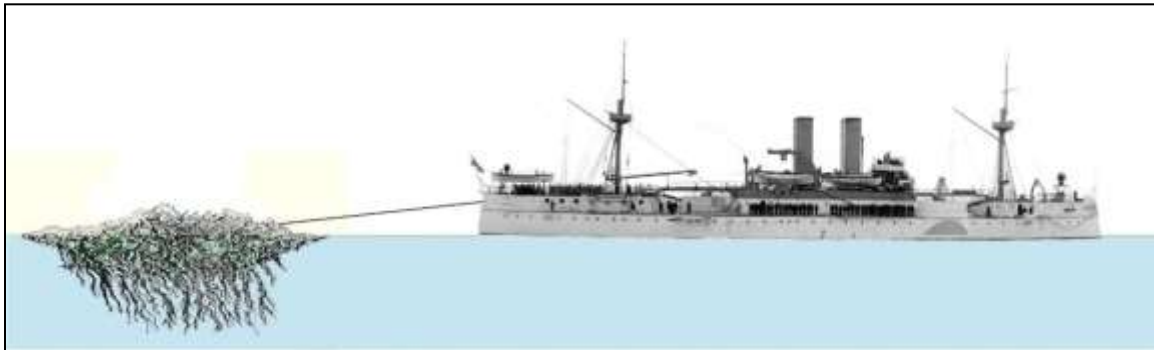
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Penny Pond-Joe Pond Complex, 1973
Kettle-hole bogs and ponds.



Alternate History

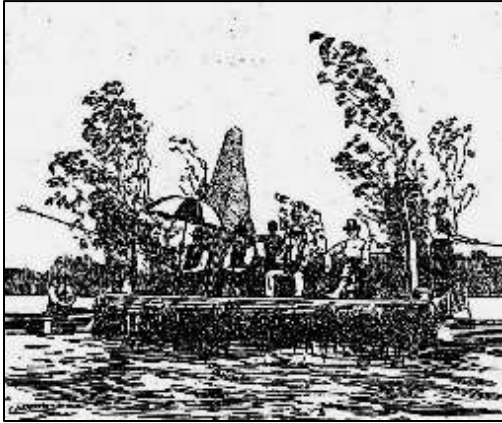
Below, the USS Maine tows an island loosened from the Main coast to Havana for rum making, arriving on February 16, 1898, one day too late to blow up and initiate the Spanish-American War.



CHAPTER 65 RECREATE

A floating island of enjoyment, what could be more pleasant? It's the making of dreams. But as our first examples show, not all dreams work out as dreamed.

The Floating Island Company



According to Frank W. Flanders, a Michigan boat builder, artificial floating islands would revolutionize the way in which Americans vacation. Flanders "invention" drew wide interest from the press just before the turn of the century. We use quotation marks, however, because as will be seen, he may not have invented anything.



The illustrations are taken from period newspapers, probably non-penned on observation, but rather on the text.

We'll quote from the following news items, but same copy appeared in scores of papers.

- (1) "Floating Islands. This Man Would Organize a, Company to Build Them," Biloxi Daily Herald, October 20, 1899
- (2) "Islands That Will Float. An Invention of a Michigan Man Makes Moving Archipelagoes One of the Possibilities of the Future," Fort Wayne News, May 30, 1900 -- (2).
- (3) "Have a Floating Island. Michigan Inventor Will Build One While You Wait," Sausalito News, October 21, 1899
- (4) "Floating Island, the Newest Summer Idea. A Company Has Just been Formed to Turn them Out Any Size or Shape Desired -- Millionaires Can Own an Archipelago," Salt Lake Tribune, July 16 1899

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- (5) "Have a Floating Island. Michigan Inventor Will Build One While You Wait." Kalona News, October 20, 1899

Man claims that nature made the mistake when she constructed islands and set them up in American lakes and rivers of anchoring them too securely to one place. An original minded individual on Lake Michigan is going to show nature that the ideal islands should be made to move from place to place at the will of the lords of creation. (1)

The great disadvantage of an island is that it always remains in the same place, and the few genuine floating is that exist in the world are naturally unpleasant places to visit when pleasure only is to be considered. In the case of his invention, however, everything is different, and his floating islands will be ideal creations in every sense of the word. In fact, so certain is he that they need to be seen but once to be popular that he has organized The Floating Island Company, and by next summer, if not before, movable archipelagoes will probably be one of the features in the list of summer enjoyments. (2)

Frank W. Flanders, of Sturgis, Mich., has invented a floating island not the kind that mother used to make [See Chapter 84 regarding Mother's] but a real live Island, that can be towed from place to place to suit the convenience of its proprietor. (5)

Uses

Fish, like human beings, have certain places where they feed and rest, and when these feeding places are located the islands can be anchored over them and visitors can have the assurance that they are in the vicinity of good fishing grounds. (1)

As these islands can be built of any size, it is believed that they will prove to be very desirable places from which to shoot or fish. Instead of sitting all cramped up in a boat on one of these islands it will be possible for a large number of people to shoot or fish at their ease, and if the island is built large enough to permit of the erection of a house upon it, nothing could equal it as a place in which to spend an afternoon or a hot summer's day. (2)

It bears the weight of one tree and a large number of bushes and shrubs, while a good sized tent erected on it affords protection from the weather for 6 persons at night. (3)

Mr. Flanders also holds that the floating island has other uses than those of mere pleasure. For instance, he insists that the invention is destined to revolutionize the art of life saving in times of accidents at sea. If the invention was to be used for such a purpose it would have to differ in countless ways from the craft that is used for pleasure alone, but, upon the same principle of construction, it would be possible to build an island that would be easily capable of supporting at least 50 people, and, at the same time, be so arranged as to be launched from the deck of a ship without much trouble. (2)

The Advantage of Mobility

The fortunate owner of an island who invites his friends to stay a few weeks and finds the people of the neighboring mainland not to his taste can remove himself and his guests from that locality with as little trouble as a yachtsman who has merely to weigh anchor and steam away. (4)

At one time they could be anchored off Newport, and if for any reason that city by the sea became unpopular, it would only be necessary to summon a tug, and the island could be towed without least trouble to Bar Harbor or any other fashionable resort by the ocean. (2)

When the wind is not blowing too hard, it can easily be moved about with a rowboat and can be anchored in any place desired, or on the other hand, it could be drawn into shallow water, after which it would require no more than two men to move it high and dry upon the beach. (2)

Of course, such islands would not have the speed of a steam yacht, and yet they would prove a popular adjunct to that form of conveyance. In other words, the yacht could be used when

speed was required, and the island could be brought into play at such times as comfort only is needed to be thought of, while the fact that they could be carried along with the steam yacht from place to place makes it possible to have them always at hand when needed, an advantage not possessed by the average island of natural construction. (2)

Appearance

For the roving: landsman who has hermit-like proclivities, the floating island will be a boon and a blessing in several kinds of color. (4)

Of course you will not be limited as to verdure. You can have any number of plants you desire, if you wish to buy an island, or can place any other such restriction upon your order. In short you will be absolute monarch of all you survey. (5)

Is intended to at once begin making them on a large scale, of any size, shape or variety of verdancy. (1)

Safety

It is constructed so that its platforms are high and dry above water, where no wave can splash. It has no rocking motion and is perfectly stable. Though it floats upon air-tight casks, there is no danger of their puncturing. (5)

"The islands are so constructed," said Mr. Flanders, "that the platforms are high and dry above the water, being at least 3 feet above the level of the lake so that no wave could splash on, rock, or disturb the island in any way." (4)

Such an island as this, however, would easily bear a small cabin and will remain perfectly stable even when the water is rolling quite high. (2)

Nothing can tip or sink them. (1)

For timid ladies and children, they cannot be beaten. (1)

In short, it is possible to use it for any purpose conceivable where a stable and safe float is demanded. (3)

The floating island as a refuge for the very rich has been both a theme of literature (Chapter 11) and legal schemers (Chapter 53). Flanders had his potential clientele identified

If you are a millionaire you can have an archipelago of your own, if you choose, where you may summer or winter free from the vulgar gaze, but still in reach of any water resort in the world. (5)

It will then be possible for the millionaire to possess a movable archipelago, each island of which has its house and other facilities for the comfort of its inhabitants. (2)

It will be possible for some millionaire with the means to satisfy large ideas or order an entire archipelago of islands moored off Newport, Bar Harbor or any other fashionable lake or ocean resort, thereby changing the appearance of the vicinity so that the oldest inhabitant will fail to recognize it. (1)

When the millionaire owner of an archipelago of floating islands tires of one locality he can have his island removed anywhere he pleases for the cost of towing, thus adding to the floating island residence the attraction that has heretofore belonged exclusively to the houseboat. (1)

The millionaire class is not the only ones that will profit from this new invention. Large islands with extensive archipelagoes might be beyond the means of those whose purses are not heavy, but as smaller island are to be constructed, the man of limited means will be able to possess himself of one without much trouble. (2)

Reporters were led to believe that a full-scale prototype had undergone testing.

When your correspondent interviewed the inventor of the floating island, Mr. Frank W. Flanders, the latter gave the following description of the new idea in movable habitations, and also supplied a photograph of one the first islands constructed as a model to test the practicability and utility of the idea. (4)

He has built one such now, and has it anchored in a little lake near his home, where he can spend day after day upon it, either for the purpose of work or recreation. (5)

"The photograph of the experimental model I have given you shows a party of 7 or 8 fishermen enjoying themselves fishing under the shade of boughs and umbrellas. This island is 12 by 16 feet in size and 19 persons have been supported on it without reaching its capacity." (4)

"It is anchored where the water is 20 feet deep and remains perfectly stable without any rocking motion while the waves are rolling quite high." (4)

The island that Mr. Flanders has built as an experimental model is 12 feet by 16 in size. On it, 19 persons have been supported without taxing its capacity. (3)

An island that is 12 by 16 feet in size will easily support 20 or more people, and while this is the largest one that he has yet constructed, he is perfectly confident that they can be built of any size. (2)

Reporters were informed of the test after the fact, it seems, as no newspaper, national or in the region of Sturgis, appears to have witnessed the demonstration. Though there is mention of a photograph, only the two sketches shown at the beginning of this section were ever printed.

There is a novel principle involved in its construction which will not be explained until letters patent are secured which will fully protect the inventor. (4)

Mr. Flanders believes, that his floating island idea can be used for saving life at sea, as with the principle of construction that he is trying to secure a patent for an "island" capable of easily supporting 50 people could be launched from the deck of a ship and could not be overturned by wind or waves. (4)

He proposes to make islands to order when letters patent are issued at Washington for his invention, (5)

Contrary to such assertion, however, no application was ever filed with the U.S. Patent Office.

So what can we conclude regarding Frank W. Flanders?

It is doubtful that he had a patentable invention. A raft on drums is not a "novel principle." It's telling that he didn't bother to file patent claims.

It seems doubtful that a 12 by 15-foot prototype was successfully tested. Flanders would have wanted the publicity.

Flanders' floating island would not have been as stable as advertised. As a boat-builder, he would have known this.

Flanders appears to have understood fishing, but it seems to have been for gullible investors.

For the Hunters

"Great Shooting Along the Roanoke River. Steering the Flocks Toward the Guns of the Ambushed Hunters -- The Floating Island Method," Monticello Republican Watchman, February 27, 1889,

The "floating island" method is simply a counterfeit of the well-known Susquehanna sink-box, although the native makes his contrivance out of a raft of light lumber, and having numerous

holes in the boards constructs a dense ambush of bushes and twigs, and floats at will right into the midst of the unsuspecting flock.



Susquehanna Sink-Box



Floating Island Method

The Great Lake Michigan Bathing and Fresh Air Resort Company

Two clippings from the Chicago Daily Tribune tell the story.

"May Build Floating Island. Company Plans Unique Resort off Devon Avenue, Asks the War Department. U.S. Officials Refer the Matter to Mayor Busse," March 27, 1910

A plan to construct a floating island amusement resort 1000 feet off the Lake Michigan north shore came to public attention yesterday when Maj. Thomas H. Rees of the United States Engineering Corps wrote to Mayor Busse about it. Whether the scheme is to go through depends upon this city authorities.

The corporation which plans the resort is the Great Lake Michigan Bathing and Fresh Air Resort Company, whose representatives in negotiations with the government engineering officials are Bowater, Arnold and Bowater, stock and bond brokers.

The scheme is to build the island by four anchors 1000 feet off a shore point between Devon and North Shore Avenues,

1910 Map, the proposed site offshore of today's Loyola University



The letter of Maj. Rees to Mayor Busse reads as follows:

"March 1910 -- Honorable Fred A. Busse, Mayor. City of Chicago -- Dear Sir. A corporation called the Great Lake Michigan Bathing and Fresh Air Resort Company through their fiscal agents has made application to the War Department for permission to build and utilize a floating structure for amusement purposes -- bathing etc. -- said structure is to be anchored by four anchors 1000 feet from shore between Devon and ore Avenues.

"Before taking any action in this matter, I desire to submit it to you in order that the proper city authorities may have opportunity to express their views on the proposition if they are in any manner interested therein.

"I will suspend action until April 1, awaiting your pleasure.

"Respectfully. Thomas H. Rees, Major Corps, of Engineers"

The letter in all probability will be referred to the city council committee on harbors, wharves and bridges. Pending action by the Chicago authorities, the federal action will be held off by Maj. Rees. John H. Pierson, representing the resort company will confer with Mayor Busse tomorrow relative to a permit,

The "island," W.A. Bowater explained, would be built of steel glass. It would be 215 feet long and 175 feet wide and on each side a bathing beach 45 feet wide. Promenade decks around each floor, 25 feet wide, are planned.

Among the features of the "island." Mr. Bowater explained, would be a roof garden and vaudeville theater, the bathing belches and bathing pools, restaurant, winter garden, aeroplane station and skating rink.

The corporation is organized under the laws at South, Dakota, and its authorized capital stock is \$500,000. Five months would be required to build the Island.

Five days later, "War on Floating Island, North Shore Citizens Say They Won't Allow Proposed Resort. Want Peace and Quiet. Thank City Officials for Efforts in Their Behalf,"

"Peace and Quiet" as the motto of Rogers Park was the slogan of the combined improvement associations of the north shore in an onslaught make last night upon the project of a floating amusement "island" in the lake off Devon Avenue.

"We will pour out the last drop of our blood before we will permit such an invasion," said the Rev. J.R. Rotswinkle, pastor of the Church of St. Ignatius, who represented the religious element of the opposition and enunciated the watchword of the meeting.

"Are we who have sought the retirement of the north shore for our residence to be disturbed by the maudlin songs and revels of an amusement resort?" asked Father Rotswinkle. "A man's house is his castle, and we will resist this incursion to the last ditch. We are not going to have any floating abode of noise and ragtime anchored out on the lake in front of our residences."

Letters from Officials Read.

Letter from Mayor Busse, Maj. Thomas H Rees, chief engineer of the war department for the Chicago district, and an unofficial opinion from the corporation counsel's office, all of which foreshadowed the prohibition of the enterprise, were read by Aid. Winfield P. Dunn.

"I can tell you," said Aid. Dunn, "from conversations I have had with the mayor and consultations with Corporation Counsel Brundage that there is little likelihood of the outrage by the Great Lake Fresh Air Resort Company being permitted.

"I don't think the plan is feasible. We have sudden storms on the lake and a structure anchored a thousand feet off shore would be a public menace."

City Controls Part of Lake

Aid. Dunn read an opinion from Assistant Corporation Council Clyde L. Day in which the jurisdiction of the city was stated as extending 3000 feet from shore, or in case of menace of water pollution, to 5000 feet.

In 1910, the final decision would have rested with the mayor, and Busse was a vote seeker. "Noise and ragtime" were fine within the Loop, but not on the North Shore.

Breakwater Chicago

Ideas, especially those having to do with making money, persist, however. Breakwater Chicago, 300 feet long and 100 feet wide, would feature three restaurants, a swimming pool, shops and a spa. Proposed to be anchored 1-1/4 miles east of Lake Shore Drive and Erie Street during the summer, Breakwater would be pulled by tugboat toward shore during the winter months.



From the 2014 Kickstarter description,

During the summer months, Breakwater will be anchored in an existing anchorage zone just inside the outer breakwater. While anchored offshore, Breakwater will only be accessible by boat. Accommodations will be available at Breakwater for private boaters to tie-up with our vessel, providing a great destination for boaters in Chicago and from surrounding states. Water taxis will also be available to shuttle non-boating guests to and from our location, making Lake Michigan even more accessible, with or without your own boat.

Pan-American Exhibition

"Sidelights on the Pan-American," Buffalo Evening News, April 22, 1899,

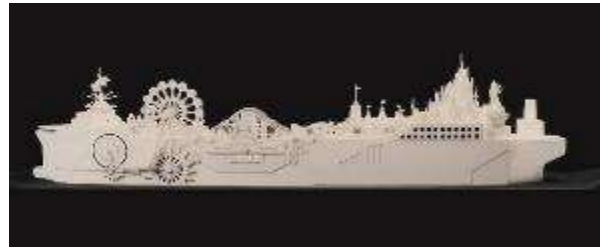
Thomas Cary suggests that a floating island be built if the Exposition is held at the Front.

"It would attract a great deal of attention," said Mr. Cary. "I want to see a large one, but if there can be nothing better, let it be a small one. I would rather see an old scow converted into one than not to see any.

"I would build an immense floating island, with immense trees all over it, several feet of earth and mud, bushes, and all that. Then there could be a place of amusement on it, a theater, or a hotel."

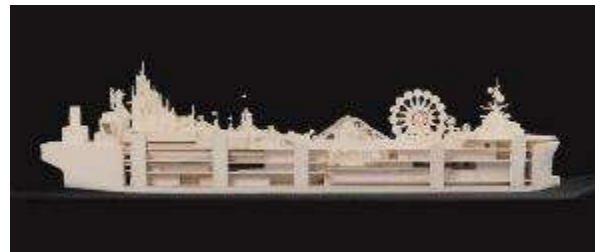
S.S. Disney

A concept known Disney planners as the "Floating Theme Park," but unofficially, the "S.S. Disney," could bring the theme park experience to places could not able to support a full, year-round park.



The island of entertainment would be built within a converted supertanker.

The ship would have stay approximately two and a half months in each port and then travel for a week or two to the next destination. The ship would not return for four or five years, so we would not over-saturate the market.



Port side with shell removed showing the 5 major decks

On the top deck would be the Orbitron, Casey Jr. Train, a large Ferris Wheel, Alice in Wonderland's spinning Tea Cups, Dumbo, and a Fantasyland Carousel under a glass dome. At

the stern would be It's a Small World, a water ride in other Disney parks, but an Omni-mover ride here.

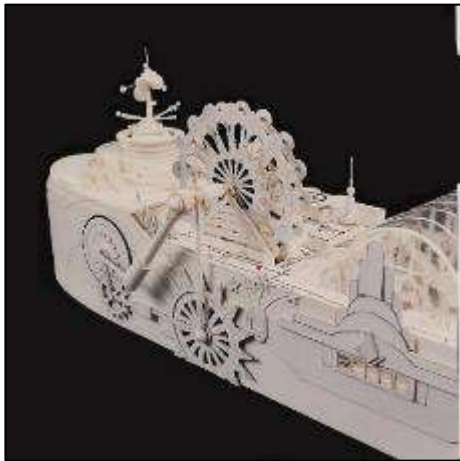
Turn right from the glass-canopied entrance to Fantasyland; turn left to Tomorrowland. Frontierland and Adventureland attractions were not needed.

Other attractions included an Aladdin and a Little Mermaid dark rides, Roger Rabbit's Car Toon Spin, Toon Town area with Mickey house, Indiana Jones roller coaster, Star Tours, 20000 Leagues under the Sea and a 3D movie theatre. Six restaurants would serve fast food, as the management didn't want people to sit and eat for an hour

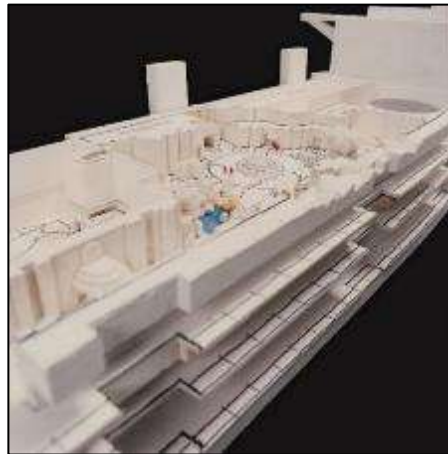
Tickets would be for one of two shifts, 10,000 guests in the morning/early afternoon and another 10,000 in the late afternoon/evening.

The pilot house and bridge wings would be incorporated into a themed facade, allowing the ship's crew could see everything.

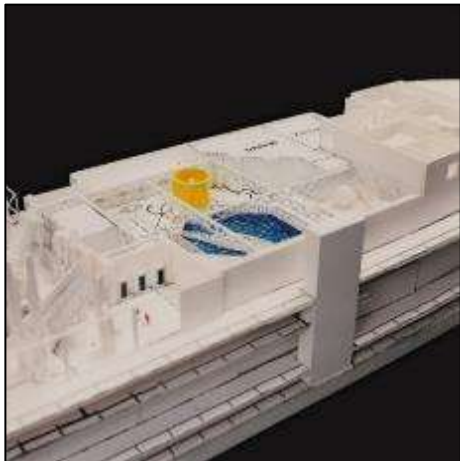
As it is not safe to launch firework from the ship, a barge could be used to launch the firework from a safer location



Ferris wheel exterior armatures would be stowed while sailing.



Main deck removed. Toon Town area. Grey disc, spinning tea cup.



Main deck removed. 20,000 Leagues under the Sea area interactive area. Yellow cylinder, giant aquarium.



It's a Small World Omni-mover in front of pilot house.

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But the corporate strategic planning group didn't want a floating theme park; it wanted a cruise ship. Now that Disney has multiple land-sited parks, the time for this floating island has passed.

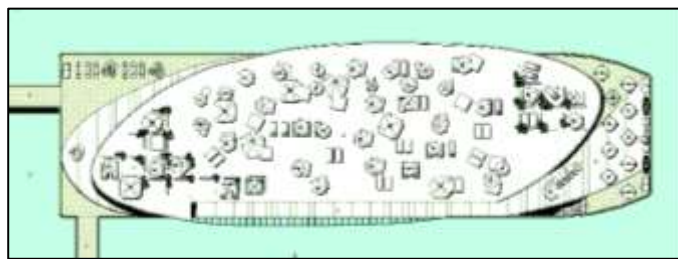
Flanders', Disney and the Great Lake Michigan Bathing and Fresh Air Resort Company saw recreational potential in floating islands, but as we have seen, success wasn't to follow.

Manhattan

Built in 1952, New York City's Pier 57 was designed by Emil Praeger, designer of the floating piers for Allied landings in World War II. Pier 57 is supported by three buoyant concrete boxes built in Haverstraw, New York, and floated down the Hudson.



Below are two proposed attractions, a floating pool in the East River and a floating beach park on the Hudson.



Brooklyn

"Hurricane Sandy: The Truth Is Stranger than Fiction," Brooklyn Magazine, October 30, 2012, describes a floating island turn-about.

Perhaps one of the most eerie pictures was that of Jane's Carousel in Brooklyn Bridge Park, partially submerged in the East River, its lights still on, a glowing, floating island in the dark waters. But there are many other haunting images that will stay with us long after all the waters have receded.



But enough of such difficulties. Some projects have worked well.

San Francisco

Forbes Island, a ferro-cement floating structure, roughly 100 by 50 feet, was launched as a residence in 1980 in Sausalito, but forced to move by regulations. Now moored in San Francisco Bay, the island, with its 40-foot lighthouse, is a restaurant and tourist attraction at Pier 39.

Featuring live palms, a sand patio, a waterfall and a thatched Tahitian room It's the only floating island in the world," developer Forbes Thor Kiddoo grandiosely misinformed the San Francisco Chronicle staff writer, August 22, 2010



Prague



Proposed swimming pool

Seoul

An artificial island complex was central to an ambitious 2007 plan to develop the Han River bisecting the capital city of South Korea. Three floating islands, ranging in size from 4000 to 35,000 square feet, cost more than \$120 million. The islands float on an airbag pontoon system tethered by automated moorings that dynamically responds to wind, wave, tides, and river discharge. The largest island, able to support facilities up to 6,400 tons, is harnessed to a 500 ton concrete block.



Inaugurated in June 2011, the project was fraught with fraudulent construction work and corruption and shuttered that same year. According to the deputy mayor,

The Floating Island will be recorded as the most problematic project invested by a private sector firm.

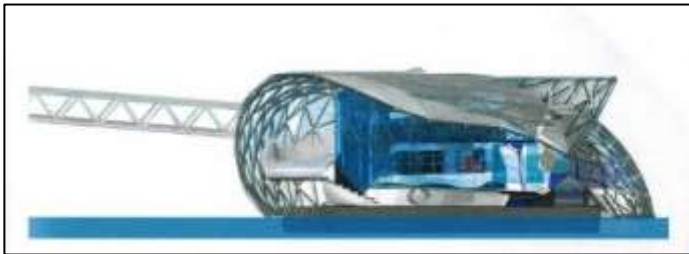
In 2013, the government announced renegotiated terms of operation and will revitalize the project by transforming it into a cultural complex within a year.



Chapter 76 describes how the three islands were modeled in the laboratory.

Austria

The Murinsel in Graz was constructed as a floating island on the River Mur in 2003. The \$5 million seashell-like deformed 155-foot-diameter double geodesic dome floats on pontoons free to rise and fall with the river's ebb and flow. The structure is tied to bank-side moorings by two hinged and ramped footbridges. Steel-latticed glass represents deep marine cities of the future.



India

"A Floating Cricket Stadium," Archi-Tech Design Competition, Tech-Fest 2012, IIT Mumbai, by Piyush Laiswalo, Aayush Bhaskar and Siddharth Rath, proposes floating stadium for Goa, sailable on occasion to Mumbai.

We sought inspiration from nature, the rudder fin of a humpback whale and the propulsion technique of an octopus.

We propose the propulsion mechanism found in octopuses and many other cephelopods. Water would enter into large funnel-shaped cavities. which expand. and then contract, expelling a large jet of water. The energy driving this mechanism would be derived from non-conventional energy sources.



While the mechanical concept remains begs for a whiff of realism, the facility itself represents an attractive vision of the future.

Japan



Floating Restaurant, Yokohama



Amusement facility on 130 by 40 by 5 meter platform, designed to resemble the Parthenon. Includes a 3D theatre, an aquarium and marina, Hiroshima

Awaji Island Fishing Pier, Hyōgo, 101 by 60 by 3 meters.



Singapore

The Marina Bay Floating Platform is a sports field made of steel, 120 meters long and 83 meters wide. The platform can bear 1,070 tons.



Hong Kong



Jumbo Restaurant

Thailand

The Archipelago Cinema, designed to float on the sea, premiered at the inaugural edition of the Film on the Rocks Yao Noi Festival.



The Philippines

"Inflatable Island." Subic Bay, 3,400 square meters of inflatable slides, towers, bridges, human launchers and Tarzan swings.



Germany

The 2003 International Exhibition of Gardening in Rostock employed three pontoons on the River Warnow: Desert Island, Green Island and Flower Island.



Berlin's 105-foot-long floating Arena Badeschiff (that's German for "bathing ship") floats in the River Spree,



Austria

The Floating Opera Stage "Seebühne" is constructed on Lake Constance every other year for the Bregenzer Performing Arts Festival.



Golf

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"Athletic Women," Philadelphia Inquirer, February 18, 1900,

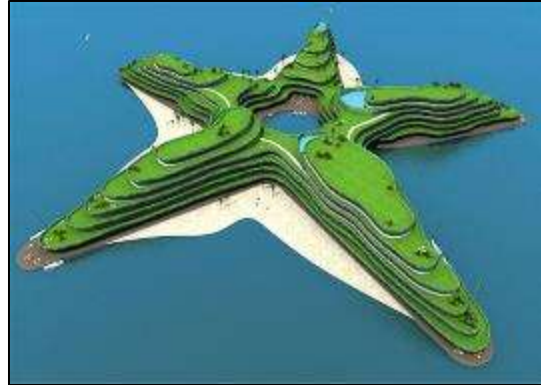
A golf course down South includes among its features a floating island, which is in the center of a small pond, and until the Charleston earthquake, a few years ago, was as firm as the continent itself. But somehow, after the shake-up, its moorings became loosened, and now it floats with-all the nonchalance of the delicious dessert it typifies. This floating phenomenon is a perfect heartbreak to the golfer who plays upon these links. Nothing short of amphibious caddies are required, for the golf balls have a way of taking to the water like ducks and It takes uncommon aquatic skill to rescue them. Some of the caddies tremendously object to this wholesale dousing, and while they hunt like good fellows of terra firma, they draw the line at diving. This hesitation isn't altogether due to an innate dislike for water, but the youngsters fear that at any moment the floating island may veer in their direction and submerge them forever. "Consider the caddies of the field, they toll not, neither do they spin," says the song. Neither, it seems will they dive.



Golfers are allowed two attempts to land on the 15,000-square-foot floating hole 14 of Idaho's Coeur d'Alene Resort. The \$1 million green floats on 104 30 by 10 by 3.5-foot polystyrene-filled concrete cells staggered in two layers and topped with 4 inches of pea gravel, 14 inches of sand on and Penncross creeping bentgrass sod. The green is irrigated directly from the lake.

Anchored to the lake bottom by pile-pinned metal plates, the green can be located 95 to 200 yards from shore by a one-inch cable powered by electric winches.

When constructed, the zero-footprint solar-powered 18-hole golf course in the Maldives will be expected to attract a wave of big spenders. Luxury accommodations will overlook the greens, fairways and the surrounding reef. Underwater tunnels connecting the holes will allow golfers to experience the reef. Cost is expected to be \$520 million.



The star option

Other conceptions,



The course may make a better nesting environment for turtles than one on solid land, as this one lacks lighting which can cause disoriented females to crawl inland after laying eggs.

And we're not just speaking of fairways floating in place. We've a century's worth of ideas for seafaring tees.

"New Luxury for Coronation Tourists," New York Herald, April 13, 1902

When wireless telegraphy makes it possible to have a stock ticker in every stateroom, with a theatre at one end of the ship and grand opera at the other; with cycle and automobile tracks around the main deck and golf links on the hurricane deck, it will not be necessary for the ordinary passenger to change very much his mode of life in making a transatlantic trip, and instead of little to do save to lie on deck and stare at the rolling waves, with the dull hours relieved only now and then with a passing sail, a school of porpoise or a game of whist, he can pursue aboard this floating island of steel the same offices and pleasures which make life endurable to him on land.

"Mobile Homes Offer Posh Living on the High Seas," New York Times, April 26, 2002

The World may be large as ships go, but it's only about a 10-minute stroll from prow to stern. You can break your walk with a visit to the pool, the library, the casino, the tennis court, the art gallery, shops or the golf range. When at anchor, golfers can drive biodegradable balls, which dissolve after four days in the sea, at a green on a floating island trailing behind the ship.

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CHAPTER 66 FORECAST

Let us speak of what is yet to come, perhaps the weather, perhaps the market, perhaps the twists and turns of politics. To do this, we'll track a floating island.



A freely-floating island moves by one of two engines, the current of the water or the impetus of breeze. Divination from island movement is thus divination from the movement of the water under the island and/or the wind blowing upon it.

Current follows a predictable direction. River channels flow down-slope. Ocean currents circle in established arcs. Lakes drain toward an outlet. Where behavior remains the same, there's no basis for divination. It's like a prediction based on an apple falling upward or downward.

Wind, on the other hand, alters direction, often unexpectedly. Austromancy is the prediction of future events based on the observation of wind, not uncommonly by tossing chaff into the air.

Ancient Greeks practiced wind divination in the sacred grove of Dodona, dedicated to Zeus. In his Theory of the Planets (1318), Thadeus of Parma, like Roger Bacon and other authors of his day, recognizes knowledges based on earth, water, fire and air -- geomancy, hydromancy, pyromancy and austromancy. The Black Arts of the 15th century added necromancy to the list, as well as axiomaticity -- exactly what it sounds like -- and other magical arts, but our interest is confined to a wind-driven island on the water surface, a type of weathervane, in other words.

We'll not consider prognostications associated with the rising and sinking of peat islands (Chapter 48), Bio-gasses generated in summer cause islands to emerge; as the decompositional processes wane with colder weather, the island again sinks. If the price of corn falls soon after an island rises in July, it's likely because corn is harvested in August.

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Weather Prediction

We note in Chapter 19, Jan Paulette's observation in Locke and Porttipahta Dammed Reservoirs (1965) that peat in Swedish lakes sometimes seems to float at the onset of bad weather, hypothesizing that a drop in atmospheric pressure expands the volume of entrained gas. While such correlation seems physically unlikely -- the gas doesn't expand that much -- the fact that it's even suggested speaks to our propensity of seek phenomenological patterns.

Association between island movement and weather would seem reasonable where a change in wind signals a change in weather. In some regions, for example, a change from southwesterly to northwesterly gusts can signal the arrival of a cold front.

From Dylan's "Subterranean Homesick Blues,"

*You don't need a weatherman.
To know which way the wind blows*

Observing an island float in a particular direction, we perhaps don't need an austromancer to suggest if a raincoat may be in order.

Christian Rast mentions in Dissertatio Historico-Physica, de Insula Natante Gerdaviensi, Vulga Schwimmbruch (1707) that the residents of Gerdauen predict the weather by the movement of a floating island. The claim is repeated in Universal Geography, Or, A Description of All Parts of the World, on a New Plan (1829) by Conrad Malte-Brun,

Gerdauen is built at a short distance from a lake, remarkable for a floating island, which by its motions indicates the state of the atmosphere, and the inhabitants call it for that reason, the almanac of Gerdauen.

A System of Geography, Ancient and Modern (1812) by James Playfair predates Malte-Brun by 17 years, but is probably more up to date.

Gerdauen, a little town, with two seats, on the Omer, built in 1325, about five leagues east of the river Alla and nine east northeast of Bartenstein, near the border of a lake containing a floating island which is gradually decreasing.



Gerdauen, in today's Russia, we regret to report, no longer has such an "almanac" floating island.

Bill Hitchings, in "Waltzing up the Isle," Melbourne Sun, February 19, 1976, mentions the local theory that movement of the islands on Pirron Yallock (Chapter 62) foretells the weather.



"Floating Islands" ECOS Magazine 50 (1986) likewise discusses Pirron Yallock.

According to local legend, you can foretell the weather by observing changes in their position.

Chet Van Duzer remarks in Floating Islands, (2004),

Mr. Cliff Ward, on the basis of twelve years of observations, claimed to be able to predict the weather from the positions of the floating islands at Pirron Yallock, Australia

The timber-covered banks on the northern side of Pirron Yallock provide more protection from wind than the lower and comparatively more open opposite shore. If wind is the main influence on the movement of the islands, they would more generally be expected move along northern side of the basin, and this has been noted. A light wind would first move the smaller islands, but as the wind continues to rise, the larger islands would follow, shouldering aside the smaller ones. If the wind suddenly changes, the islands careen off the far shore or each other, ending up nearer the less-frequented southern side.

Pirron Yallock's island trajectories thus can reveal a good deal about the wind patterns, and from that, something about the forthcoming weather.

Wyman Guin's "A Man of the Renaissance" Beyond Bedlam (1964) is a short story set in a seascape of meter-sized to kilometer-sized islands that drift between latitudes. As latitudes tend to be characterized by seasonal patterns, it makes sense that the location of Guin's islands might be seen as a predictor of weather.

Market Prediction

As noted by Lawrence Klein in The Making of National Economic Forecasts (2009),

Wind should not be an explanatory variable in the econometric model; therefore, the forecast should not change with the wind direction.

Chapter 66 -- Forecast

But economists -- even of the Nobel Laureates, of which Klein is one -- can at times be wrong, and the Welch have a fairy tale and novel to counter Klein's skepticism.

A market forecast derived from the floating island of Llyn-y-Dywarchen (Chapter 51) is recorded by D. Parry-Jones in Welsh Legends and Fairy Lore (1953).

Local people believed that "if it floated towards the north the markets would rise, if to the south they would fall."



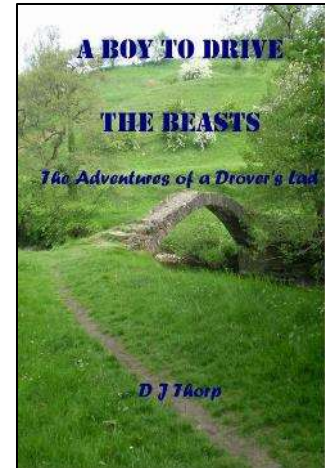
D J Thorp includes a similar prognostication in A Boy to Drive the Beasts, The Adventures of a Drover's Lad (2014).

"Mynydd Mynyllod," he said, pointing to the high ground just above them. "You can just see the tip of the lake over there. We'll let them have a good drink while we study the markets."

Sam remained puzzled. He could see nothing at all remarkable about this small lake, except for its isolated position up in the hills, nevertheless, he followed Ambrose to the marshy lake shore where he stood leaning on his stick, staring intently at the ruffled waters for several minutes.

"That's good," he said at last. "The Bala prices should be up this week."

"How can you tell that?" asked Sam, "just by looking at the water?"



"Ah, but I wasn't looking at the water, I was looking at the island -- the floating island just over there."

Sam followed his gaze towards what looked to him like amass of floating vegetation.

"See," went on the drover, "it's over on the Bala side of the lake today, that's a sign that the market prices there will be good. If it was drifting the other way -- towards Corwen -- then the prices would be better there."

Sam looked at him doubtfully, but Ambrose was clearly serious.

Regarding the wind, Klein is of one persuasion; the Welch are of another, why Thomas Carlyle calls economics "the dismal science."

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Political Prediction

More consequential than the price of a commodity would be the fate of a political entity, Japan's Lake Ohnuma (Chapter 25) once having been such an indicator. In 739 A.D., the priest Gyouki counted 66 islets, naming each after a province of Japan. During the Edo Period (1603-1868), the fortune of a province was divined by the movement of its namesake islet.

It is still said that no island will move if a wicked one is looking at it, and one who witnesses the islets move is thus validated.



But are we being too narrow?

Could movement of a floating island be the consequence of other than current or wind?

In Chapter 29, we discussed Austria's Hautsee, in which mermaids and water spirits were once believed to direct the floating island, and thus foretell fate. Not wishing to interfere with ordained future -- a hackneyed conundrum in today's sci-fi genre, but not when the island grounded in 1834 -- superstitious locals cut it free.

Until, however, we identify forces other than wind that drive islands back and forth, a weathervane will probably do just as well as an island in forecasting the future.



CHAPTER 67

AVOID SWIMMING UNDER IT

The Feat

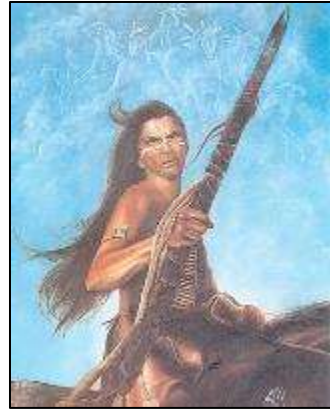
Vermont's 200-acre Lake Sadawga was named for Chief Sadawga of the Sokokis, who, as folklore has it, swam under its floating island without taking a single breath.

A romantic rendition of a Sokoki warrior.

The island is roughly 25 acres, substantially smaller than the report of the San Francisco Call, July 27, 1890.

The island contains 100 acres and actually floats upon the water. One can easily pass entirely around it in a boat ... one of the most remarkable freaks of nature and one of the greatest curiosities in the world.

The March 1911 Technical World Magazine reported the island to be 75 acres



Were the island circular, at 25 acres, its diameter would be 1180 feet, twice the world record for underwater swimming without fins. Were the island 100 acres, its diameter would be four times the record.



And distance aside, a sub-island transit would be through a tangle of roots (Chapter 22)

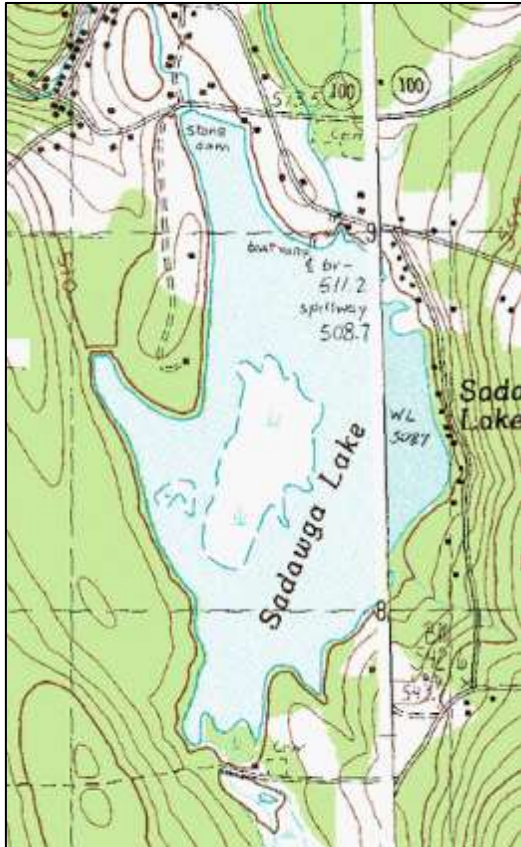
Any free-dive passage will prove fatal for swimmers less than legendary Chiefs.

None the less, the island's worth a chapter -- more than that, even, as more can be found in

Chapter 37 regarding walking,
Chapter 68 regarding picnicking,
Chapter 36 regarding fishing, and
Chapter 62 regarding towing.

The Island

Sadawga's floating island is the remnants of a sphagnum mat once connected to the shore that floated some 6 to 8 feet to the surface when the lake dammed in 1880, tore free and re-rooted itself nearer the lake's center.



The island, with its convoluted passages and interior islands, is today a spectacle for kayakers and botanists. Cranberries, sheep- and bog-laurel and cotton grass cover the island's more-solid portions. Bladderwort emerging from the water surrounding the mat captures tiny swimming fauna.

To the right, an emergent mat with little soil content, Such uprooted patches, rarely exceeding a few hundred square feet, are blown about the larger lake until they break apart.



Early Observations

"A Wonder in Vermont," [San Francisco Call](#), July 27, 1890, circa-1840 reminiscences of Judge Hosea Ballou, as interviewed by the [Boston Globe](#),

"This floating island, as you call it, is known to the people about here as the swimming island. I have known it for considerably more than half a century, and I have watched it with deep interest. When the dam was raised last year I was curious to see whether it would be submerged, or would rise with the water. I thought perhaps it had become attached to the shore, and that the roots of the tamarack trees might have grown down into the mud, and become so firmly attached that it would not rise. But as the lake was raised the island came up with it, and has just the same appearance now that it had fifty years ago, only it is larger."

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"Then you have noticed that the island has increased in size during the fifty or more years that you have known it, have you, Judge?"

"Oh, yes, it is much larger now than it was when I was a boy. I should say it then covered something like fifty acres and the tamarack trees on it were small."

"How many acres do you think it contains now, Judge?"

"I don't know that anybody has measured it lately, but I should say that it contained over a hundred acres and had about doubled in size during the last fifty years."

"I noticed as Mr. Crozier and I drove round on the east side of it that there were smaller islands which seemed to be broken off from it and were swimming about independently. Do you know when they were detached from the main island?"

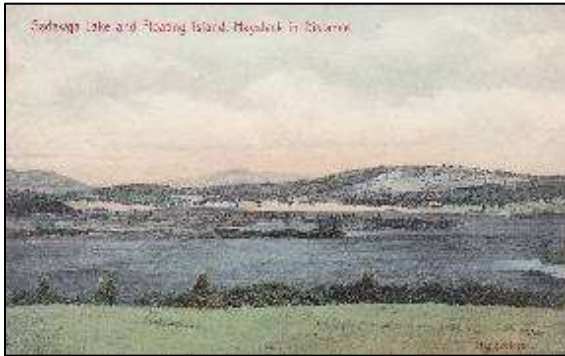
"No, I cannot tell you exactly when. I know sometimes when there has been an exceedingly strong wind from the west or south for several days that parts have been broken off from the island. I think the last piece broke off about ten years ago. I presume you noticed that one of the smaller islands containing about two acres had quite a forest of tamarack trees upon it. My impression is that the trees so caught the wind, acting something like sails, that this smaller island was torn away from the other part of it by the force of the wind."

"A Floating Island," Guernsey Magazine, April 1881,

The fact that it really floats on the water was made evident last year. At that time a stone dam was built at the outlet of the lake over six feet high, which raised the water a little more than six feet. When the gates were shut, and the water for the first time began to rise in the lake, there was great curiosity to see whether the island would be submerged or rise with the water. It took about forty-eight hours for the water in the lake to rise to the top of the dam, and it was then discovered that the island presented exactly the same appearance that it did when the water was six feet lower. There is no part of the island that has ever been more than two or three feet above the surface of the water. Therefore, if it did not float when the lake was raised six feet by this new dam, it would have been entirely submerged.

Since the water was raised this great mass of land has floated about more readily than it previously did. Portions of it, containing from one to three acres, have been broken away from the main island, and go swimming around independently. There are four such pieces. Three of them are close together, and already fifty or sixty rods to the north-east of the main island. Sometimes they are five or six rods apart. Then, again, they will be all in a cluster, the smaller ones floating around faster than the larger ones, as the wind carries them more easily.

Early 20th-Century Postcards



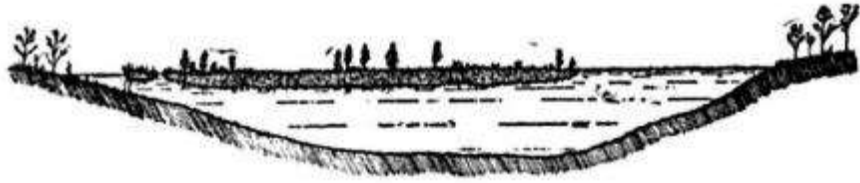
"Floating Islands" Bulletin of the Geographical Society of Philadelphia, January, 1914, by Sidney Powers, represents one of the first scholarly articles on the subject.

In Sadawga Lake there are several floating islands, the largest of which covers about fifty acres of water. This lake was dammed in 1886, raising the water about ten feet. Before this date it was only a small pond, about the size of the present island. At the side of this pond was a bog consisting principally of cat-tails and sphagnum. Apparently this mat was but loosely attached to the ground, for when the water rose, it also rose as a body. At present the water is used to supply power to a mill and therefore in dry summers the islands settled down on the bottom, but when the lake is full, there is six feet or more of water under all the islands. Since 1886 pieces of the large island have broken off. Some of these have drifted ashore, while others remain near the main island, evidently held in place by the roots of the alders, which must be at least four or five feet long. In 1911 in a storm, several large masses of the sphagnum were separated from the large island and blown ashore.

The sphagnum on this island is found growing to some extent among the cat-tails, but on the outer end of the main island there are none of the latter. Pitcher plants and the low shrubs listed above grow abundantly with the moss. Black spruces and larches growing in the sphagnum on the new outer edge of the island attain a height of twenty and forty feet respectively. Since they grow over the deepest part of the lake they cannot be connected with the bottom. The trees continue to live on the smaller islands, after they are blown to the shore. The mat of sphagnum is two and a half to three feet thick.

In "Floating Islands, "Popular Science Monthly, September, 1911, Powers provides a cross-section.

The large island grew out from the shore and was broken off by high water. It is now attached at the east side.



The main floating island is the horizontal profile in the upper right. Elsewhere are three smaller islands.



From "Geology of a Small Tract in South Central Vermont," Fourteenth Biennial Report of the Vermont State Geologist (1924) by George Hubbard,

There is considerable peat in this pond, but owing to its repeated increase in size none is now above water. It has a small so-called floating island. This is not an island free to migrate over the lake, but to rise and fall where it is with the water. It consists of roots, stems and other vegetation (with some highly organic soil), which is attached to the bottom by long stems so it cannot leave its moorings, but can float and rise and fall as lake-level changes.

Hubbard points out, in effect, that Power's illustration omits the root tethers, without which, the island would crash from one shore to another.

In 1925, a large piece of the mother island broke free in a gale and lodged on the east shore.

In 1933, high water and winds broke off a 3-acre section which floated about for some time before piecewise anchoring, also on the eastern shore, spoiling the approach to cottages.

The floating island was recognized to be a natural resource worthy of legal protection in 1937. From "Bill to Protect Floating Island," North Adams Transcript, February 6,

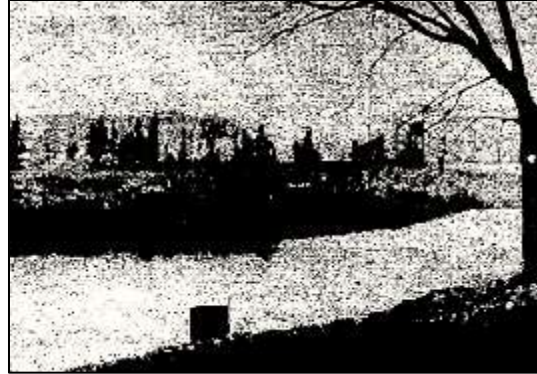
In Sadawga Lake in Whitingham, Vt., Provides Penalties for Damaging it.

A bill designed to protect the famous "floating island" in Sadawga Lake in Whitingham, Vt., was introduced in the Vermont House yesterday.

The bill, introduced by Rep. Fordyce E. Hager of Whitingham by request, provides a fine of not more than \$100 and not less than \$25 for anyone convicted of damaging the island or changing the water level in such a way as to injure it.

"Floating Island Set Loose by Storm Draws Sightseers to Lake Sadawga," North Adams Transcript, November 28, 1950,

Section of Whitingham's famous Floating Island in Sadawga Lake is shown in its new location near the dam alongside Route 8 and in front of the Lake Sadawga house where the gale winds lodged it Saturday after it had broken loose from the main Island. Scores have driven to the lake to see the phenomenon which has occurred twice before in a quarter of a century.



Before and after a strong wind, 1950



"Section of Floating Island Breaks Away," North Adams Transcript, November 9, 1953,

A piece of the floating island in Sadawga Lake was seen floating Saturday morning. It started from the eastern shore and was came to rest in a shallow part of the lake.

"Section of Floating Island Goes for a Sail," North Adams Transcript, May 8, 1954

A small piece of the floating island in Sadawga Lake broke loose and floated about the lake Wednesday evening. After a few hours it went back up the lake and attached itself to the big island again.

The Legal Wrangle

In 1956, Houghton Sawyer, and a sixth-generation Sadawga sawyer at that, opened the gate at Sadawga dam, "his" gate, as he would have put it. "Stubborn Yankees in Tussle Over Tax Bill," Ocala Star Banner, July 30, 1956, begins the story.

Cottage owners along Lake Sadawga and Houghton N. Sawyer were an odds today because the lake no longer exists.

Sawyer drained the water from the 220-acre lake he has owned for 30 years. He said he no longer felt up no paying the tax bills.

A thin trickle of brook water winds through a mud flat where swimmers and boaters held sway a month ago.

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Chapter 67 Avoid Swimming Under It

Mud prevents recovery of boats now anchored on the lake bottom. And the insects are nothing to write home about.

Sawyer says there is an easy solution: he'll close the gates, refiling the lake if the cottage owners will help him foot the \$150 annual tax bill.

Some of the townspeople don't see it that way. Selectmen E.J. Roberts of Jacksonville, who happens to be Sawyer's first cousin, says Sawyer is "just being ornery."

"He figured that if he let the water out, people would rush to him and get on their knees and beg him to sell it," Roberts said.

"I figured I had to do something dramatic," said Sawyer. "But you know how those stubborn Yankees are."

"Their Lake is Gone," Bennington Evening Banner, July 31, 1956,

Armand Beauchemin, left, and Wilfred Bresbois stand only inches above what was once the water level of Lake Sadawga in Whitingham. At their left is a grounded "floating island" which once toured the pond driven by winds.



Response came quickly. "Sawyer Told to Close Gates and Refill Whitingham Lake," North Adams Transcript, August 24, 1956

Lake Sadawga's famous Floating Island may soon be flowing again -- if it rains enough.

As things now stand, it will take more than closing the gates to refill the lake and refloat the Floating Island. Only the main channel and a few shallow pools remain since Mr. Sawyer first opened the gates in June and practically drained the pond in what he admitted was an effort to help persuade the cottage owners to help pay the taxes on the lake. The cottagers made no overtures, however, and Mr. Sawyer closed the gates July 23, but he said that he had "made his point."

Although the gates have been closed a month, there has been no noticeable change in the water level because of the drought. Cemetery Brook, Lake Sadawga's main inlet, has been reduced to a mere trickle, and the dry weather and winds have been blamed for reducing the water level still further by evaporation.

Atty. Agostini said "no action has been brought by anybody," but he revealed that representatives of the Vermont Fish & Game Commission had been to Whitingham late last week to inspect the lake and talk with Mr. Sawyer.

A national new story, it was. "A Stubborn Yankee Yanks a Plug," Life Magazine, November 5, 1956.

Houghton Sawyer is a sixth-generation Vermonter and every bit as stubborn as could be expected. He owns the water rights to pretty Sadawga Lake at Whitingham, Vt. but ever since the family power plant shut down, he has had to pay what he felt were high taxes on the rights and made not a penny on the lake. This spring he opened the flood gates and lowered the water level 12 feet, shrinking the lake by four fifths, leaving cottages on the banks high and dry and killing fish.

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He was, said Sawyer, preventing a flood and repairing gates. A likely story, cried the outraged cottagers. He was trying some sharp trading. He wanted to capitalize on the rights, they said, and was demonstrating the lake's value. Sawyer refused to let the lake refill. The cottagers fired off a petition to the state water conservation board, which came and held a meeting in the town hall. Afterward Sawyer allowed he would negotiate over the rights. But he had riled too many other stubborn Yankees. The cottagers, hopeful the board will countermand Sawyer's action, are waiting for the decision and angrily contemplating their shrunken lake.

From old shore, cottager looks at ponds left by drying lake.



"Second Hearing on Whitingham Lake," North Adams Transcript, December 11, 1956

Sawyer is now thinking of the lake on terms of a source of water for town fire protection. He feels the town should buy the rights and set up a pressurized hydrant system using lake water.

Ever creative in justification, Sawyer explained to the Vermont Fish & Game Commission that draining the lake was in the interest of both dam safety and hydropower. From "Lake Sadawga Decision Expected Within Two Weeks. Six-Hour Hearing on Dam, Water Level Conducted by State," North Adams Transcript, August 15, 1958,

Mr. Sawyer again drained the lake, this time he said for the purpose of installing a new screen in the sluice gate and cleaning the racks as the first steps toward resumption of again generating his own power for his three-man chair stock factory. He has not produced his own electricity for seven years.

Sawyer reasserted that the lake was not a natural waterbody, a claim blatantly erroneous.

Dr. Dahl testified that his surveys showed that the original lake was created by glacial action thousands of years ago. Prof. Countryman stated that extensive peat deposits around the natural basin, near the Floating Island, bore out the finding. John E. Ceruti of Montpelier, a state hydraulic engineer, displayed a chart of the lake soundings which, he said, revealed a natural dam forming the basin.

Defeated in the facts of the matter, Sawyer appealed to the Vermont Supreme Court, where he prevailed on the basis of jurisdiction.

Back on top -- at least for a short duration -- Sawyer was ready to negotiate.

North Adams Transcript, January 7, 1964

Houghton Sawyer pulled the plug again in Lake Sadawga in Whitingham and it has not only upset cottage owners around this man-made body of water but ice fishermen are being drenched by high fountains of water when they cut holes to fish. A "low flow" law would compel Sawyer to keep the plug in when water is drained to the point where it endangered the life in the pond.

Sawyer seeks to sell rights to Lake Sadawga to the state for \$50,000. Southern Vermont legislators say the state is being given much larger bodies of water more suited to development by property owners who wish to be rid of .responsibility of maintaining their lakes and ponds.

Sawyer sold the water rights to the State for \$50,000, a hefty markup from the original \$150 tax dispute, or the water rights' \$500 assessed value. While the press bemoaned the transaction as extortion, the State justified the payment based on the market price of a comparable lake. The

headline in the April 27, 1964 North Adams Transcript concludes the tale: "\$50,000 Price Tag. Vt. Buys Sadawga Lake Ending Feud over Level."

Arguments that seem not to have been raised by the State:

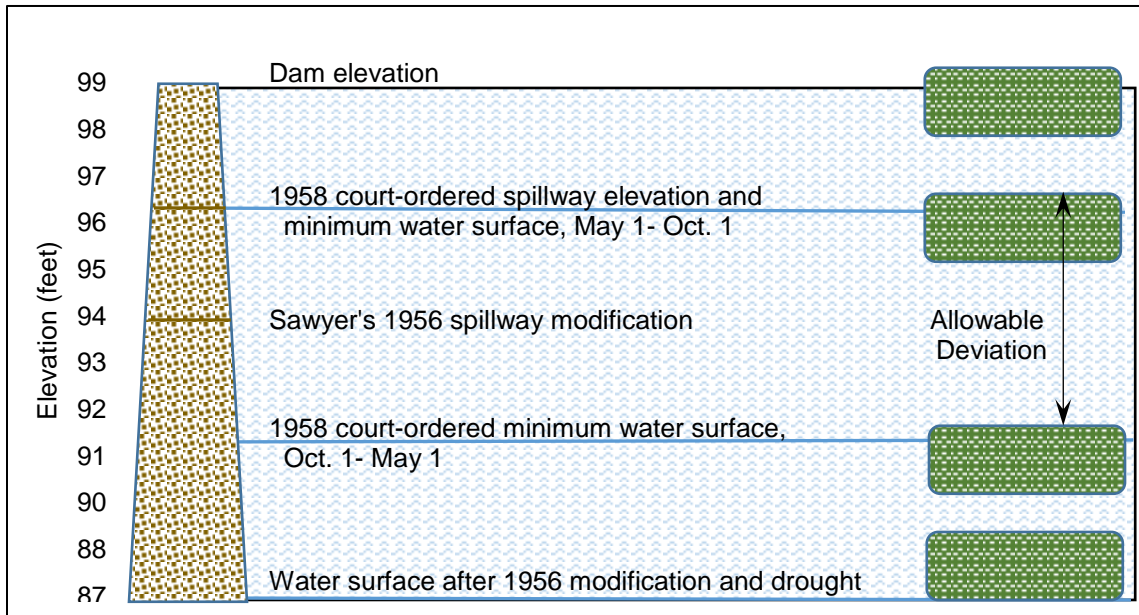
The lake was navigable.

The lake was not artificial.

The lake was a natural features said to be unique to America

But thinking was different in the early 1960s and Yankees enjoy a tussle worthy of cracker-barrel retelling.

Pertinent elevations



Subsequent History

Sadawga's floating islands are today owned by the State of Vermont. The lake level is maintained at elevation 96.2 feet May through September and at no less than 92.2 feet for the remainder of the year.

The mother island remains anchored to the lake bed, rising and falling with the season. Children islands still stray as the wind directs, though perhaps not with the frequency of past decades.

A few clippings:

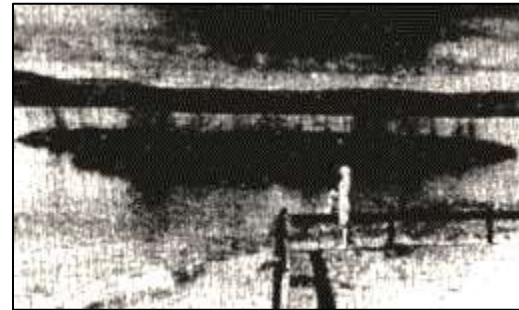
"Floating Island on Move Again," North Adams Transcript, June 1, 1966

After floating around in Sadawga Lake in Whitingham, Vt., over the weekend, the small island beached in front of camp of Girardo Bolognani Sunday. Island broke off from large main island, visible in background, and is second to come to rest in front of camp.



"Floating Island Breaks in Two," North Adams Transcript, May 13, 1969.

Mrs. Donald R. Boyd and daughter Naomi, 4, look at 200-by-100-foot section of floating island that broke off from main part, in background, in Lake Sadawga in Whitingham, Vt. Section in foreground was torn away by 40-mile-an-hour wind and drifted more than 300 yards toward boat docking area Sunday.



Marine Research

Sadawga isn't the only floating island to have challenged the best of divers. Jacques Cousteau was inspired to build his own. "Island for Divers," Binghamton Press, December 17, 1962

Underwater explorer Yves Cousteau launched a floating island yesterday to serve as a base for hi teams of divers. The island will be towed to a site between Nice and the island of Corsica. Divers will descend into the water through a 150-foot communications tube. They will live on the floor of the sea for long periods in a pressure cylinder Cousteau tested earlier this year.



As reported in "6 Crewmen Missing in Floating Island Fire," Binghamton Press, February 21, 1965, however, disaster ensued.

Six crewmen apparently forced off sea researcher Jacques Cousteau's floating Mediterranean island by fire were missing last night in heavy seas;

Maritime sources said a French ship last night reached the structure. 125 miles off the French Riviera and found no signs of life. The 225-ton island bore traces of fire and its two lifeboats were gone.

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Chapter 67 Avoid Swimming Under It

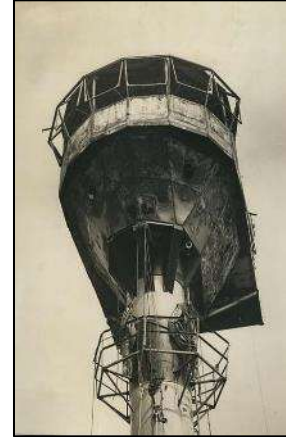
A tubular structure -- 220 feet tall and 11 feet in diameter -- the island floats vertically with only 50 feet protruding from the water. On the top end is a helicopter landing platform. It is anchored to the bottom of the sea with a 7,000-foot nylon line.

The floating island was built in Nice and towed to its present position about a year ago for underwater studies.

"6 Frenchmen Saved as Fire Hits Artificial Floating Isle. Scientists in Dinghy Rescued by Tanker after Abandoning Tube in Mediterranean," Toledo Blade, February 22, 1965

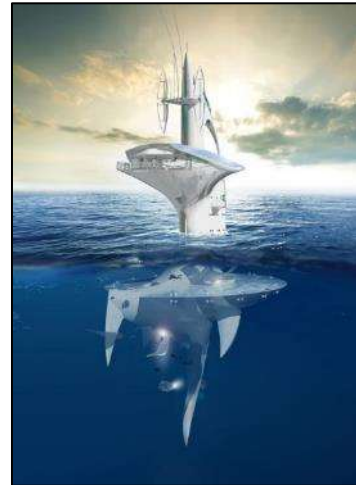
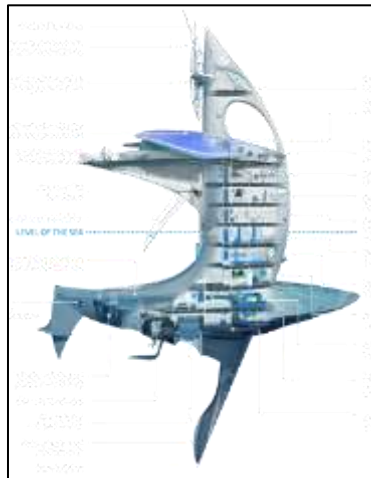
The six men, four scientists and two maintenance crewmen, were aboard the artificial island, a floating laboratory designed for marine research by French underwater explorer Jacques-Yves Cousteau, when it caught fire.

After attempting to fight the blaze for several hours, the men were forced to abandon the island, a 55-yard steel tube floating vertically in the water and surmounted by a platform and living quarters.



Fire Damage

SeaOrbiter, a conceptual observation vessel, is a yet-more futuristic version of Jacques Cousteau's loss, and one presumably more attractive for divers.



If We Must

Floating island for SCUBA divers, Great Barrier Reef



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CHAPTER 68 PICNIC



What better place to enjoy a picnic than upon a floating isle! We've a number of such islands where picnickers have feasted, though in some cases, the fact may be buried within the references.

Onota Lake, Massachusetts

"Bought a Floating Island," Boston Evening Transcript, August 14, 1902

The deeds have been recorded at Pittsburg transferring a tract of land containing about 'three-quarters of an acre from Edward L. Parker to Alvah N. Slawson, at private figures and the deal a novel one. The property in question is known as the "floating island," and is located at times in different parts of Onota Lake. As near as can be learned the island was originally a part of Mr. Parker's farm on the west shores of Onota Lake, and about fifteen years ago became detached and started on a junket about the lake.

Occasionally it would float to the shore and remain a few days and different persons owning property along the lake front would claim the strip as soon as it had annexed itself to their holdings. One man went so far as to tie stout ropes about the trees on the "island" and shore, hoping that, the elusive land would take root or become firmly wedged to his farm, but a strong wind one night broke the letters and sent it adrift again.

Mr. Slawson, the new owner, has built a cottage on the "island," the structure having been put together in sections and it is made ready for occupancy in twenty-four hours. The strip, it is thought, is held together by the roots of the numerous trees, but it is predicted that it will soon fall apart, as it has been gradually growing smaller, and is covered in place; with water during each spring and fall.

"Natural Ships on English Lakes," Camperdown Chronicle, November 11, 1902

The original owner from whose territory it broke away in the first instance has just made a bargain of it to an adventurer who has now built a small bungalow on it, where, with pots, kettles and goat, he intends to live a Robinson Crusoe life daring a part of each year.

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"Floating Island Sold," Fort Wayne News, April 6, 1903, on wooded one-acre island which had wandered around the lake for 43 years

Albert Parker has sold his floating island in Onota Lake in the Berkshires to Albert S. Lawson, who says he has now securely anchored a valuable piece of property that has been wandering about Onota since 1860. Originally a part of the old Parker, it consists of about one acre, heavily wooded and has been the object of several lawsuits over its ownership

For a time the island would be next to a certain shore and the abutting owner would lay claim, only to awake some morning and find that it had migrated toward his neighbor's property. The island is a favorite resort for picnic parties.



c. 1908

"Around Berkshire. Lake Still Has Floating Island," North Adams Transcript, September 6, 1966

There's still a small floating island in Onota Lake. On the complaint that it presents a hazard, Mayor Remo Del Gallo inspected it by boat.

The island was once over three acres in size, but over the years has diminished until now it is only 15 or 20 feet in diameter.

Years ago it was secured by piles driven into the lake bottom. It is located near the old road under the lake, a good distance from shore.

Del Gallo doesn't know what, if anything, should be done about then island. The complaint was brought by H. Arthur Chaiffre. Dal Gallo says that Chaiffre fears children landing on the island might step into the water, thinking it shallow, and drown. The water is about 10 feet deep there, Del Gallo said.

Early records show few invasive weed problems. The paper mill that owned the water rights drew down the lake annually, allowing the bed to freeze and invasive Eurasian watermilfoil to die. Today, the lake is mesotrophic, meaning that it has medium levels of nutrients, but is en route to eutrophication due to runoff linked to development. Drawdown curtailed in the mid-1980s, leaving harvesting as the primary method of vegetation control, but harvesting failed to check the growth. Fluridone treatment began in 1999. As for the famous frog, see Chapter 45.

Lake Orion, Michigan

From "A Sinking Island. The Story of a Queer Freak of Nature. Dr. C. Henri Leonard's Theory," Richmond Dispatch, November 28. 1897,

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The cottagers have named a strange spot in the vicinity the "floating island," but this is something of a misnomer. It is really a sinking and a floating island. During several months of the year it lies submerged in about twenty feet or more of water, then for the balance of the year it is out of water, and picnics can be held upon it, if so desired.

"A Picnic on Sinking Island."

It is used as a hunting place, when out of the water, by some of the boys of the summer resident families, waterfowl being shot from its surface.



Member» of my family have rowed over the spot when the Island has chosen to sink out of sight, and have endeavored to reach its submerged surface with a 7-foot oar, but could not do so.

The island approximates an acre in extent. It is, of course, very wet for the first week or so after arising from lake's depth, but as the season wears along, it becomes dryer, and, as before, can be used for picnic purposes. I would be afraid of its stability under a large load, though I have been told by one of the old residents that one season the people tried to hold it down by pouring on its sunken surface fourteen wagon-loads of large stones, rowing them over the lake's surface to the place where the island was known to lie submerged; but, like Banquo's ghost, the island would not down; it makes its entree into air every year just the same.

Sadawga Lake, Vermont

The noted floating island of Sadawga is discussed in Chapter 67, but here we'll note the reference to picnicking in "Vermont's Floating Island," Galion Inquirer, June 13, 1890.

The island is larger than any farm in the neighborhood, containing over 150 acres. Its peculiarities lie in the fact that it daily shifts its position, being first on the north, then on the south and again on the east or west borders of the lake. It is known as "the floating island," and has kept up its aberrant voyage since time out of memory. It has many trees upon its surface, some of which are from twenty to thirty feet in height, besides an immense thicket of cranberry bushes. It is rare that a portion of the island breaks oil and sinks to the bottom, and its stability has made it a favorite resort for picnickers and others seeking an outing.

Pratt's Pond, New Hampshire

"Mason, N.H.," Fitchburg Sentinel (Massachusetts), September 8, 1891,

About 75 people from Mason and Greenville held a picnic at Pratt's pond, Sept 3. The four row boats on the pond were in constant as all who wished had plenty of boat riding; there was also croquet, ball playing, seesaws and hammocks in the grove, and seats and tables for the convenience of the diners.

Lake Tiorati, New York

"Floating Island is On a Cruise," Reno Evening Gazette, August 22, 1946, mentions picnics on a lake discussed in Chapter 33.

For the first time in three years "the floating island of Lake Tiorati" is off on a summer cruise, much to the pop-eyed amazement of vacationers.

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The little island, an acre in size and home to several families of wood mice and birds, is meandering along at the rate of several hundred feet a day.

Even the most convivial picnickers are inclined to take the pledge when they wake up from a nap under the trees in Palisades Interstate Park and find that the island which stood just off-shore isn't there anymore.

From American Weekly, March 23, 1947,

Floating islands have always been a subject for myth and superstition, and no doubt to many an enchanted couple, Lake Tiorati's mass of roots and grass has loomed shimmering and roseate, as in a fairy tale book.

They exist mainly in fiction, rather than fact. Yet there's one within 50 miles of New York City that's been drifting around its lake for more than 20 years.

The island has sometimes caused no little consternation to Bear Mountain visitors unacquainted with its roving habits. There are stories of picnickers who settled down upon it while it touched the shore and found themselves well out toward the middle of the lake when they came to pack up after lunch.



Scotts Pond, Rhode Island

When the 45 mile Blackstone Canal was opened in 1828 connecting Worcester, Massachusetts to Providence, Scott Pond and Cranberry Pond were raised 17 feet to make the canal level to Ashton Dam on the Blackstone River. At the south end of Scott Pond, three locks dropped the canal into the Moshassuck River Valley.

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Scotts Pond 1831 and today

The raising caused a mass of vegetation to rise as a floating island. "Scott's Pond," The Original 1:1, May 1829, indicates that that the island was about an acre and had cranberry plants, one maple tree, and one pine tree

"A Floating Island," Arizona Sentinel, June 6, 1874,

A pond in Lonsdale, R.I., has a floating island like those found on Georgia lakes. It is a quarter of an acre in extent, and to put it nautically, draws six feet of water. It has been accumulating for twenty years, and its soil is so solid that it maintains a, thick growth of trees twenty-five feet high. Picnics are held on this island, and romantic lovers go there. The wind blows it from point to point in the pond, sometimes moving it with considerable velocity. In the neighborhood it is the subject of many superstitions, one of them being that sweethearts who vow fidelity upon it will never be faithless.

The island still floated in the early 1900s.



Sauk Lake, Minnesota

From "Floating Islands Menace a Bridge," Minneapolis Journal, August 28, 1906,

About a thousand persons gathered in the park to see the uncanny sight of the old Ashley picnic grounds coming into town. While this occasions no alarm it will be a great expense to the city.

American Island, South Dakota

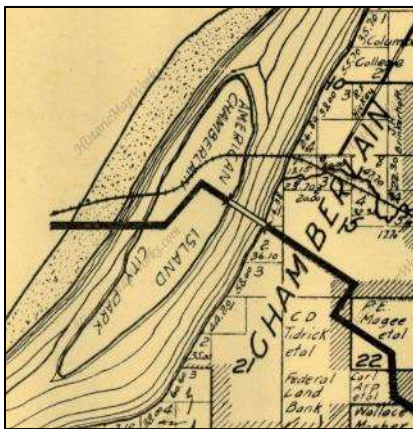
In 1804, Lewis and Clark camped on the west bank of the Missouri River below what would be later known as American Island, approximately 2-1/2 miles long by 1/2 mile wide, at Chamberlain, South Dakota.

Passed an island about the middle of the river at 1 mile this island is about a mile long and has a great proportion of red cedar on it.

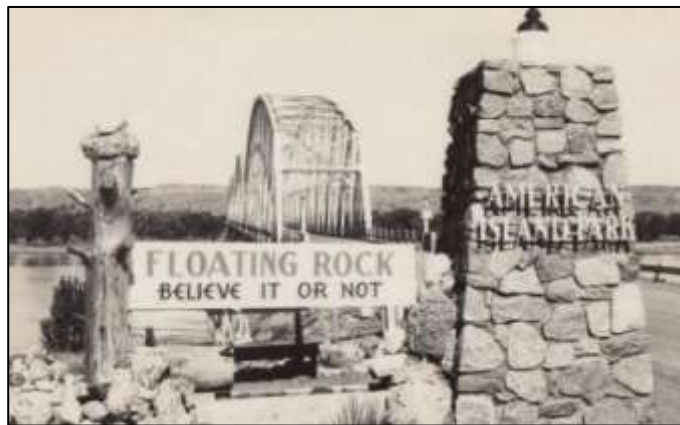
The channel on the island's west side was closed in 1911 by a railroad fill. The island was connected to the west bank by first a pontoon bridge, then a railroad bridge, and finally a highway bridge in 1925, the inauguration of which included a reenactment of the Custer massacre in which 5,000 Indians sham battled 250 soldiers from Fort Meade.



A public park in the island constructed by the Civilian Conservation Corps included a 150 x 100-foot pear-shaped swimming pool, a 9-hole golf course, a half-mile race track, a baseball field and picnic ground. Chautauquas were held under a great tent until an auditorium was constructed. Williams Jennings Bryan spoke in 1918.



1930



1940

Competition of Fort Randall Dam in 1953 flooded the island, and with it picnics thereon.

Los Angeles, California

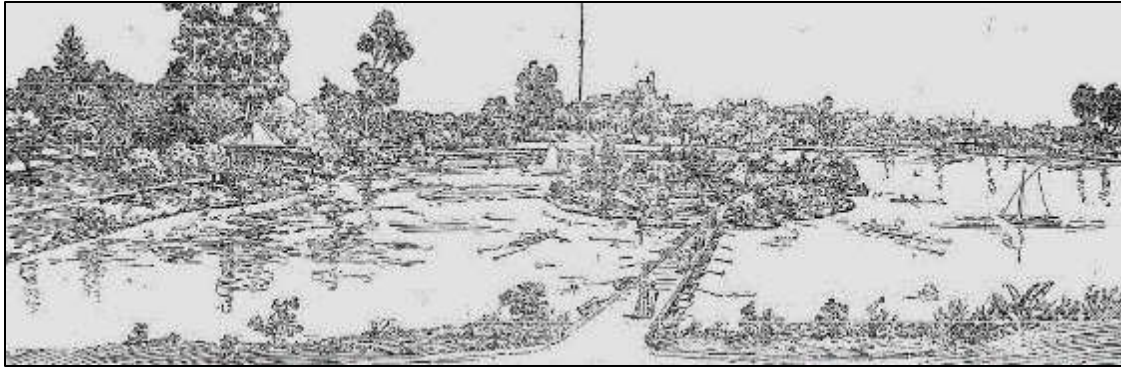
Picnics have long been enjoyed in what was once Westlake Park in Los Angeles. From "Holds Moonlight Picnic," Los Angeles Herald, July 26, 1904

Delightful Gathering by W.C.T.U. at Westlake Park. The Los Angeles Young Woman's Christian Temperance union held a delightful moonlight picnic at Westlake park last evening. Dinner was served at 6 o'clock when a large company of young people gathered around the table.

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The lead paragraph of "An Isle that Floats for Lovely Westlake," Los Angeles Times, May 7, 1911, speaks to the mystique of floating islands.

In contemplation of the Westlake possibilities, the vision arises of the mystic and enchanted Delos, a floating island, the smallest of the Cyclades, noted in mythical lore as the birthplace of Apollo and Diana. There is something peculiarly fascinating and mysterious about floating islands, for an uncertainty and lack of fixing produced a charm which solid Mother Earth scorns to wield. The question arises, is a floating island practicable? Such islands have been, both natural and created by man. What has been may be again. There are various practical problems to be solved, but is this not true of every innovation or weighty project?



The park in question is the modern MacArthur Park, known for its befuddling "cake out in the rain" lyrics. The lake was split in 1934 by the extension of Wilshire Boulevard. There indeed is an island, but it's one that's solidly seated.



St. Omer, France

A bit more of Hector Piers's description of St. Omer (Chapter 21),

Our ancestors, amazed as they watched them maneuver here and there on the water of the lake like tractable boats and laden with curious people who sometimes visited the islands to indulge in the pleasures of a picnic, regarded them as a small swans' nest in the midst of a vast pond, considered it regrettable that they had not been discovered by the ancients, and looked upon them as an eighth wonder of the world.

A Bit of Nautical Poetry

In "Floating Island," The Portsmouth Herald, July 26, 1906 by Wallace Irwin, a sea captain has his crew detach an idyllic tropical island, a veritable "picnic party out to sea" from its foundations so that they can tow it home.

*"Speakin' of adventures," said the pirate to the pilot,
"Mongst the South Sea Islands is the most I ever seen:
Pollywows' and willy wows and waterspouts -- a high lot
As ever scuttled of a ship or turned a skipper green.*

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*"On a sultry mornln' we was floatln' in the tropics,
Sailin' of the 'Dainty Dot' a halfmast schoonerette.
Crew was talkin' polyticks and other lively topics,
Captin' he was swiggl'n' tea to keep his whistle wet.*

*"Suddenly acrost our bows we seen a little island
Pebbly beach and palmy hills and everythin' complete.
Monkeys, parrots, cannibals a-skippin' thro' the highlands,
Oranges and cocoanuts and lots o' things to eat.*

*"'Blow me ears!' the Captin' cheers, 'that surely do look pleasant!
Picnic party out to sea -- we want for nothin' more;
Bein' in no hurry, lads, we'll linger for the present,
Tie the vessel to a tree and take a week ashore.'*

*Cordingly we done that same and scrambled on the beach, sir;
Cannibals, a-waitin' for us, awfully perlite;
Brought us figs and ostrick eggs, as much as they could reach, sir.
(They was dark complected, but they treated of us white.)*

*Well, be gum, we felt to hum on that there desert island;
Some of us caught paroquettes or clumb the cocoa trees;
Some of us lay in the shade and slept or talked a while, and
Watched the friendly cannibals a-chasin' chimpanzies.*

*When at last the week was past the Captin' said, with sadness,
"Gee! I hates to go away and leave that island thus!"
"Cap," says I, and winks me eye, "don't think me words is madness --
Why not pull the island loose and tow 'er home with us?"*

*"Good," the Captin' says, and arms the crew with picks and shovels,
Knives and saws and bathin' suits, and sends them 'neath the sea,
Where, below that little isle they cuts and hacks and grovels
Chops the whole foundations loose and sets that island free!*

Regarding the Picnic Basket

As to what to consume, consult Chapter 84.

CHAPTER 69

PUNCH A HOLE AND DROP A LINE

We visit fisherfolk from around the world in Chapter 36. Fishing, perhaps not unsurprisingly, is mentioned in any number of other chapters, as well. Here, however, we wish to specifically talk about digging a hole through a floating island, bating a fish hook and hoping for a bite. As we'll see, it's not that uncommon of an activity.

Fiction

Edgar Rice Burroughs' Land of Terror (1944), cited in Chapter 11, notes that the method of fishing is practiced as far as Pellucidar.

We had walked about a mile when we came to an area that had been partially cleared. A few scattered trees had been left, probably for the purpose of holding the soil together with live roots. In the center of the clearing a hole had been cut, possibly a hundred feet in diameter, forming a small pool. Some fifty people of both sexes and all ages were gathered in the clearing. Several of them stood beside the pool with their spears poised, waiting for a fish to swim within striking distance. The fishes must have learned from experience what would happen to them if they swam too close to the shoreline, for the center of the pool, out of range of a spear-thrust, fairly teemed with fish. Occasionally a foolish or unwary individual would swim within range, when instantly he would be impaled upon a barbed spearhead. The skill of these spearmen was most uncanny—they never missed; but because of the wariness of the fish, their catches were few.

"Die Schwimmende Insel," Damals im Kreis Bütow (1991) by Georg Sonnenburg, is about a man presumed drowned, but discovered to have fallen asleep while fishing on a floating island.

The islet was just large enough to carry a person without sinking down. And it was one of those rare floating islands which at times is on one side and at other times is on the other side. Due to prevailing west winds, the islet was mostly on the east bank of the Poponks, and only if pushed by the easterly winds in the deep gorge did it occasionally float across the opposite west bank.

In the middle of this island, Old Schröder had used a scythe to cut a square hole through which he liked to ice fish, hooking together a string and slipping it into the black depths to fish for perch. In doing this, the peat moss lowered around him caused some concern, and he often sat on his improvised chair almost up to the knees in water.

But that's just fiction.

Salsula, France

Pomponius Mela's Description of the World (c. 43 AD) provides an early description of Salsula, a salt marsh sacred to the Celtic water divinity Sulis, who was often identified with Roman Minerva.

Beside Salsula is a plain that is bright green from a slight and slender marsh grass but supported atop the swamp that passes under it. Its middle section makes that clear, since it is cut off from the surrounding parts, floats like an island, and allows itself to be driven and pulled.

What is more, indeed, where these surrounding parts are dug all the way through to the bottom, the sea is revealed because it rises up from below. As a result, Greek writers, and even our own, thought it right, either from ignorance of the truth or else from the pleasure of lying (even for sensible writers), to pass on to posterity the story that in this region a fish was pulled from

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deep within the earth, because after the fish had penetrated from the sea to this place, it was killed by a blow from its captors and brought up through those holes.

From "Appendix P. Floating Islands," Zeus, A Study in Ancient Religion 3:2 (1940), by Arthur Cook,

At (Aqua) Salsulae in Gallia Narbonensis, the modern Salces or Salses on the western bank of the Etang de Leucate was a whole plain, green with fine slender reeds and afloat on underlying water. The center of it, detached from its surroundings, formed an island which could be pushed away from you or pulled towards you. Holes made in the surface of this plain showed the sea beneath; whence ignorant or lying authors had stated that fish were here dug out of the ground.

The location today



Sadawga, Vermont

Chapter 67 has more to say about Sadawga Pond, but here we'll note a few fishing references,

"Floating Island," Ballou's Monthly Magazine 40, 1874

There is a singular natural curiosity in a lake in Vermont, consisting of one hundred and fifty acres of land floating to the surface of the water. The tract is covered with cranberries, and there are trees fifteen feet high. When the water is raised or lowered at the dam of the pond, the island rises and falls with it, affording a fine shelter for fish, large numbers of which are caught by boring a hole and fishing down as through the ice in winter.

"Vermont's Floating Island," Galion Inquirer, June 13, 1890.

Holes have been cut through the crust and fish caught, much after the fashion of matching them through the ice in winter time.

"A Wonder in Vermont," San Francisco Call, July 27, 1890, reports the reminiscences of Judge Hosea Ballou.

"The boys used to go out on it and gather cranberries and fish through it for bullheads."

"You spoke about catching bullheads through it. What do you mean by that?"

"I mean," said the Judge with a smile, "that when I was a boy I used to go on the island in the daytime and catch what are called up here bullpouts, known usually as bullheads, through the island. You know it is difficult to catch this kind of fish in the daytime. Fishermen say you can only catch them in the night."

"Tell me, Judge, how you caught them in the daytime."

"Well, we would go out on the island, taking along with us a long, sharp scythe. When we came somewhere near the center of the island, we took the scythe and pierced it through the surface, which is composed of a sort of vegetable mold, and cut a hole about two feet in diameter. Then we would drop a line through and catch bull pouts at a pretty rapid rate."

"What is your theory about these fish biting down under the island when they could not be caught in the clear water of the lake?"

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"I suppose the reason was that forty or fifty rods from the edge of the island it was dark beneath, so that they would bite the same as they would in the night. We found they would bite better on a cloudy day than they would on a clear day."

"Floating Islands" Bulletin of the Geographical Society of Philadelphia, January, 1914, Sidney Powers

Numerous holes have been made in this mat to fish through.

Pratt's Pond, New Hampshire

"Mason, N.H.," Fitchburg Sentinel, September 8, 1891,

Pout fishing through holes in the floating island on the pond is very successful.

Dark Hollow Pond, Massachusetts

"Hornpout Anglers Miss Floating Isle," Port Arthur News, March 24, 1955,

Fishermen are bemoaning the disappearance of ancient floating island at Clinton's Mossy Pond.

Before Hurricanes Carol and Edna dashed it to pieces last year, the wandering little island offered topnotch angling. Hornpout fishermen in particular found the 50-by-30-foot island a godsend. They would cut holes in it -- much like an ice fisherman would -- and drop their lines into the dark waters underneath.

This was murder on the hornpout, who like their southern cousins, the catfish, are addicted to darkness. Floating island offered them a perfect umbrella to shut out the sun. It was a feasting ground for many varieties of fish that would nose about the base of the island for worms and insects that had dug down too far.

Local records mention the island as existing as far back as 1876.

But legend dates it as at least a century old.

"For that matter," said one old-timer, "it may have been there a couple of hundred years."

The island's location changed without any special pattern. It usually rested near the southern end of the pool. But an especially in windy winter would find it driven far to the northern corner. However, it often meandered about with no justifiable reason.

Otis Reservoir, Massachusetts

Postcard, postmarked 1910, of two men fishing through a floating island in the Otis Reservoir.



Goose Pond, Massachusetts

"Island Becomes a Floater," Naples Record, June 5, 1908,

Fishermen are getting camp chairs, sun umbrellas and smoking tobacco packed preparatory to taking a trip, to Goose Pond in the Berkshires, word having been received from there that Floating Island is afloat again after having been anchored fast for six years. High water dislodged the island, which is large enough to hold a small army. Fishermen cut holes in the island, and, sitting in easy reclining chairs beneath a sunshade, pull up fish as the island moves slowly before the wind from one end of the lake to the other.

"What Happened on Massachusetts Lake with Floating Island," Mountain Democrat, November 14, 1908,

Goose pond covers 1,000 acres and contains numerous black bass and pickerel. For many years a large floating island moved from shore to shore and fishermen used to punch holes in it, and, sitting in camp chairs, fish through the holes. The high waters this season broke up the floating island, which was a mass of marshy land and roots and it has disappeared. The novel sport of fishing through land on the water is still enjoyed, however, on large floating marshes in the East Otis reservoir, about twenty miles from Goose pond.

Rocky Pond, a.k.a. Rocky Point, Massachusetts

Rocky Pond, where Cold Harbor Brook begins, is the largest of five naturally occurring ponds in Boylston is home to a curious "runaway island."

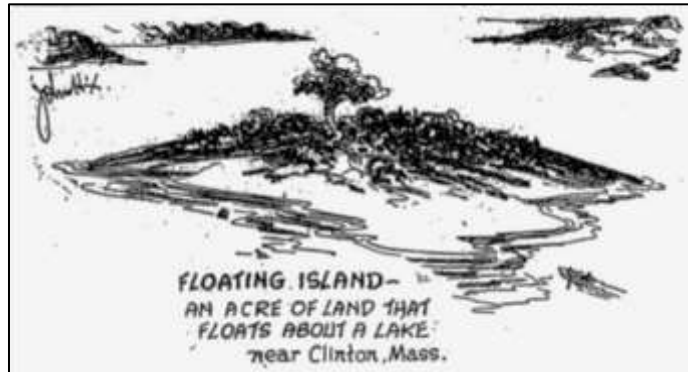
To the right, Atlas of Worcester (1870) shows a large island in the lake near its western side about halfway down its length.

By 1890, the island's position had shifted to the southeast corner of the pond. A state biologist in 1911 noted that the floating island "consists of juniper and willow and takes up about one-third of the pond."



"Strange as it Seems," Washington Post, April 9, 1931

Floating Island, the buoyant acre of land, drifts about in the waters of Rocky Point, near Clinton, Mass. The roving island called a "quage" was once part of the mainland, and tore loose when undermined by water currents. Winds continuously tear the island from its mooring (caused by roots of trees and underbrush) and blow it to the opposite shore, where it again anchors itself, and stays until another storm tears it from the mainland again.



It is solid enough to support a large tree and is used as a "raft" by fishermen. By fishing through a hold in the center of the island, fish that usually bite only at night can be caught.

The hurricane of 1938 shifted the island back to the western shore, destroying the waterfront of several cottages. "Runaway Island Gives State a New Problem," Worcester Evening Gazette, October 19, 1938, provides some particulars.

The spectacle of an island more than 500 feet long and 200 feet wide in some parts, drifting inshore in the teeth of the September hurricane, was related by Bernard Rosh, caretaker of the Acres Club at Rocky Pond. "I thought I was seeing things," he confessed. "It didn't come fast, but it was terrifying. One end swung around until one shore of the island was even with the shore line, and then it closed in, leaving only a narrow channel where some of the boats and floats had stopped it."

"The island has always been a bother," William H. Falby, owner of most of the land adjoining the pond, asserted. "It's been anchored out there as long as I can remember, and never moved before, but once in a while a piece would break off and go floating around. The pond has always been a beauty spot, but unless the state does something to remove this mess of floating marsh, the pond won't be the same again."

If the island is condemned and removed by the state, it will be the end of freak fishing which the cottagers have enjoyed for years. Emile Bonnin of Clinton, one of the Acres Club members, explained about it. "We used to be able to go out on the island, cut a hole through, and fish for pout during the daylight hours. It was sort of like fishing through the ice, except it was an island and not ice."

"You know, pout fishing is supposed to be possible only at night. But it's so dark under the island, which is only a couple of feet thick, that the pout would be fooled and pout fishing was good out there any time."

When the wind picks up, "the quag" fragments into smaller floating islands, but travels little.



Lake Garfield, Massachusetts

"A Floating Island," Los Angeles Herald, April 23, 1903,

An island 125 feet long and 30 feet wide, seemingly fixed as solidly as a rock on the east shore of Lake Garfield, in Monterey, has floated three-quarters of a mile down the lake. Twenty-five years ago the Island made a similar journey. This lake in the Berkshire hills has been a favorite fishing resort of former President Cleveland,

"Tramp Island Floats Home," New York Evening Telegram, July 25, 1903,

By action of the wind, the large "floating Island" on Lake Monterey has been propelled to where it broke away from its moorings more than thirty years ago. J.H. Parker of Boston, who owns a beautiful place on the lake, and in front of which the tramp island has been stopping, is rejoicing every departure, for there are fewer mosquitos about his summer home.

Before 1870, the island at the lower end of the lake was a steady, stay at home kind of island, but it soon acquired the roaming habit; and last spring visited the Parker place.

"Floating Island Comes Back. Breaks in Half on Trip and Berkshire Lake Now Has Two," New York Times, June 9, 1904;

The large floating island in Lake Garfield, at Monterey, in the Berkshire Hills, through which men fish for bullheads in the daytime, and which last summer took its first trip across the lake in twenty-five years, made another move yesterday. It moved back to its original place. The distance of about one mile was made in less than an hour and a half. Before striking shore it broke in nearly halves, so that the lake now has two moving islands, each of which is large enough to hold a good-sized cottage.

Lake Onota, Massachusetts

Clarence Crandall's "The Frog of Floating Island," Berkshire Evening Eagle, August 11, 1949, site of the great bullfrog story of Chapter 45,

Fishermen were wont to land on it, poke a hole down through it to the murky waters beneath and angle for bullheads lurking in the gloomy depths.

Or, "The Wandering Island of Onota," Berkshire Evening Eagle, April 20, 1950,

Then there was another appeal, apart from muskrat pelts or a mere love of the esthetic which the Island had for us oldsters -- who were carefree boys then. By cutting a hole through the

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foundation of the island, and dropping a baited fishhook down into the dark depths below, many fine messes of big bullheads were secured. Schools of those fish seemed to follow the island, about in its wanderings, apparently finding most congenial the murky water underneath. Juvenile fishermen, accordingly, vied with muskrat hunters in their periodic visits to this piscatorial mecca.

For those counting, that's six locations in what's not that large of a state. Residents of the Bay State have propensity to dig holes in floating islands for the convenience of angling.

Lake Chetek, Wisconsin

"Floating Islands of Lake Chetek Are Moving Again," Milwaukee Journal, September 29, 1934,

Wary fishermen attempt to hook some of the choice bass through open holes on the larger islands by using two boards for this purpose. One board is laid down, the other carried and then laid. Thus an adventurer picks his way between the water holes.

Prairie Lake, Wisconsin,

The WPA Guide to Wisconsin (1941),

Long and narrow Prairie Lake has six or seven floating islands consisting of detached bits of tamarack swampland held together by interlaced tree roots. The floating islands are anchored to keep them from drifting with crushing force against piers and boats. On Cranberry Island, several acres in extent, a cottage owner has cut a hole through his back lawn so that he can let a line down and fish for the bass and pike that hide among the roots on the underside.

Willow Lake, California



"Fishing a Floating 'Island'," Outdoor Life, July, 1967, describes a technique for fishing at the edge of a floating mat in Willow Lake. The mat is about 100 by 2100 feet.

A predominant feature of the lake is a vast floating tangle of sticks, weeds grasses, and other assorted flotsam and jetsam that has matted together to cover its entire western surface.

From a distance, the mass looks like a verdant mountain meadow. Green grasses grow in profusion, wild flowers poke their heads toward the sky; the edges blend into the surrounding hillsides. Only when you get close does its true nature become apparent. But even then you have to step on the tangle to appreciate its makeup.

Lightweight enough to keep from sinking, strong enough to support the weight of a person (several persons, if care is exercised), and fertile enough to support plant life, the vegetation is something like a floating island, though it's connected to the land.

Such growths get their start when grass and dirt gradually build up over debris near shore. Each year, new plants and grasses grow and die, thus adding to the mass. The one on Willow Lake now covers several acres. I have seen similar formations on other lakes in the Sierra but never one so large.

And I don't know what to call them. Natives of Georgia's Okefenokee area call similar floating formations batteries, and they have a field day hauling, out warm-water fish from beneath them.

Floyd calls the one at Willow Lake a bog. Webster might not agree with the moniker, but until a better one comes my way, I'll string along with Floyd.

Lake Titicaca, Peru

In a fish-farm manner, holes in the tourist-oriented artificial islands of Lake Titicaca (Chapter 36) are netted to contain captive trout.



Isla del Sol

CHAPTER 70

DWELL

There seems no lack of popular infatuation with floating cities, albeit much of it being architectural daydreams. Not always was this the case, however, at least in England, as seen in "Floating Islands," Saturday Magazine, December 25, 1841

It has been suggested that the water-surface of our own islands might be called upon to contribute to the support of our increasing population, but it is very much to be questioned whether the plan would be attended with beneficial results in such a climate as ours.

We've visited fisherfolk and farmers in Chapter 36 who dwell on floating islands, but we needn't be of those occupations to have such an address.

As for why we might want such an abode, Jim Gilbert, editor of ShowBoats International, comments in "In Rough Times, the Rich Go Yachting: Floating Islands as Times Get Tough," New York Times, January 10, 2002

There is nothing more secure in the world than your own FLOATING ISLAND. You have your own security. You determine your own schedule.

"Seafaring Dreams Cut Down to Size," New York Times, September 21, 2010,

A multistory motor yacht that doubled as a FLOATING ISLAND and movable mansion on the sea, the 58-meter vessel, 38 meters wide, offered almost an acre, or 4,045 square meters, of floor space, and state-of-the-art amenities. Priced indicatively at €60 million to €100 million, depending on the fittings, it was meant to satisfy -- as a Wally press release said -- "everybody's dream to own an island."

We'll begin our housing survey with what has already been constructed, but as that list is short, will quickly switch to dwellings still on the drawing boards. We'll confine ourselves to structures that freely float, as opposed to ones that, though perhaps publicized as "floating islands," in fact rest on piles or solid seabed

Floating Dwellings Already Constructed

Buoyed by 250,000 netted plastic bottles, Spiral Island was a 16 by 20-meter plywood and bamboo platform fabricated in 1998 near Cancun. The island sported a two-story house, a solar oven, a self-composting toilet, mangroves of up to 7 meters and three beaches. When Spiral Island was destroyed by Hurricane Emily in 2005, the mangrove roots were seen to intertwine throughout the island's base.



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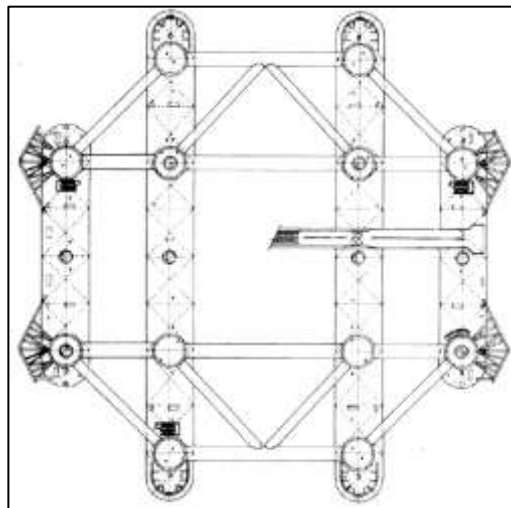
Ten bags of bottles saved from the Spiral Island wreckage were used two years later to begin construction of the 25 by 30-meter 150,000-bottle Joysxee floating island. Joysxee sports a house, two ponds, a solar-powered waterfall and river, a wave-powered washing machine and again, three beaches,



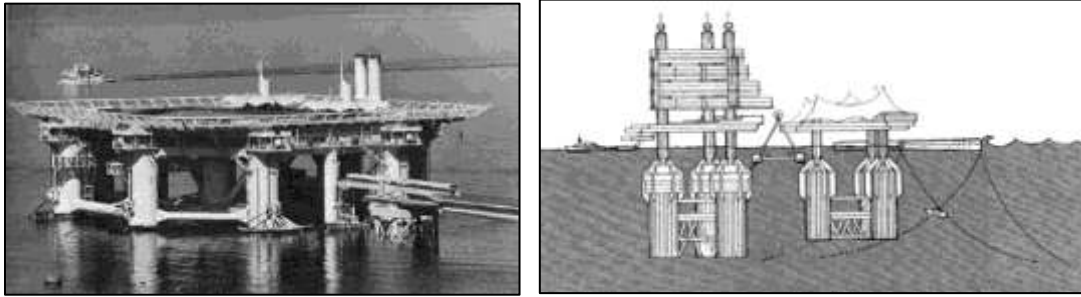
India's Trivandrum Global City of Innovation decided to bring attention toward the problem of plastic waste with the construction of a smaller floating island set on 5000 bottles. The island can support more than 20 people at any given time. The bamboo hut has solar panels.



The centerpiece of Okinawa's Expo 75 was Kiyonori Kikutake's floating city of Aquapolis, a concept of how humans could live harmoniously on the ocean. The facility, 32 meters high, and having a 100 square meter deck, was constructed at Hiroshima and towed to the Expo site.



As constructed and with a completed superstructure.



"Is It an Island? Is It a Supertanker? No, it's Aquapolis!" Brookfield Courier, August 7, 1975

Aquapolis, the man-made floating island at Ocean EXPO '75, Okinawa, is living up to expectations as the center of attraction at the world's first international ocean exposition in Okinawa, Japan.

Its vast upper deck, which dwarfs a football field, and its two lower decks are supported by gigantic columns secured to the ocean floor by 16 anchors. Aquapolis is so stable that the deck list will not exceed one degree in the roughest seas.

The literature stated that the structure rolled less than 5 degrees and heaved less than 7 meters in winds of 80 meter/second and waves of 15 meters.

After the Expo, the site became Ocean Expo Park with most of the exhibits removed. The park was closed in 1993 and in 2000, Aquapolis was towed to Shanghai to be scrapped.

Floating Island, a demonstration habitat in 100 Acres: The Virginia B. Fairbanks Art & Nature Park at the Indianapolis Museum of Art.



Australia's floating Great Barrier Reef Hotel, 90 by 27 meters and 7 stories tall, was built in Singapore. In case of a cyclone, the floating heliport, tennis courts and pool would be disconnected and towed some distance from the hotel, and one end of the main structure would be unmoored, allowing the gale to rotate the structure downwind.



After a year of Australian operation, the facility was towed to Ho Chi Minh City and operated as the Saigon Floating Hotel for a year until authorities revoked its license.



The structure was then towed back to Singapore with talk of deployment to Palau, but the deal fell through. Negotiations for use as a transit hotel on the North/South Korean border were thwarted by deteriorating international relations.



The hotel was finally towed to Kumgang Bay, North Korea, where it is now the Haegeumgang Hotel.

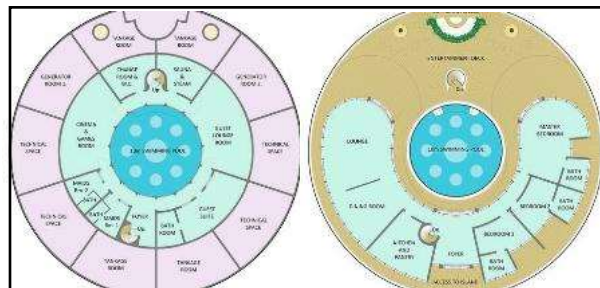


The Premier Inn, Hartlepool Marina, UK, was first designed to float with the tide. A shore-side version was eventually constructed, however, leaving the project's classification as "conceived to float, built to not float."

Conceptual Personal Islands

Family-sized floating islands with amenities far in excess of the more-rustic efforts to date are on the market, albeit at prices that keep buyers off the market. We show a few that, were a buyer willing, could quickly be assembled.

The Ome floating island, 32-meters in diameter



Lower and Main Deck



Orsos Island, 20 meters by 37, 1,000 square meters of living space. Sleeps 12. \$6.5 million



Design by Seastead Institute

As to what, if anything, distinguishes the above from "houseboat" classification, we're not sure, other than the "floating island" marketing, presumably a better sell.

Chana Schoenberger, "Floating Island." Forbes 30 Oct. 2000

Forget whatever you may recall about houseboats of the past. Wenzel's isn't small. It isn't flimsy. Nor is it cheap. "A very big item," he calls it -- and he's being modest: The thing measures 108 feet by 20 feet, 1,600 more square feet of "finished" space inside..., sleeps 14.

Conceptual Mobile Mega-Islands

Let us step up the size.

In coastal waters where the hydrodynamic forces are lower than in open sea, a converted ABS class A1 ocean-going barge which accommodates 1,200 people has been proposed.



The Freedom Ship, 4,500 feet long, 750 feet wide and 350 feet high, would circumnavigate the globe every two years powered by solar and wave energy. The floating metropolis's top deck would serve as a landing strip. The 25 story superstructure -- the conceptual drawing below shows less -- would house residential space, a library, schools, a hospital, retail and wholesale shops, banks, hotels, restaurants, entertainment facilities, recreational facilities, a casino, offices, a duty-free international shopping mall, warehouses, light manufacturing and assembly enterprises and 1.7 million square feet for exhibitions.. Cost would be \$10 billion.

The project's description, a condensation of the venture's publicity, is instructive for its aggrandized attributes. While a mile-long ship might be within the grasp of nautical design, the solar panels and/or wave-energy extractors imply technology farther advanced. Mention of the duty-free shopping mall, etc., is, of course, blatant padding.



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To the right, "Az," by Jean-Philippe Zopponi.

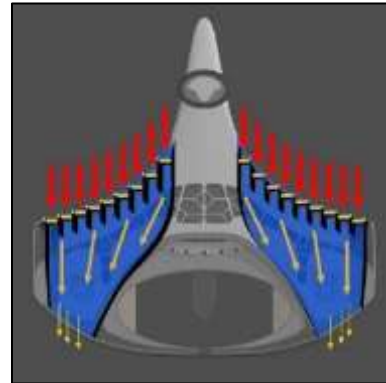
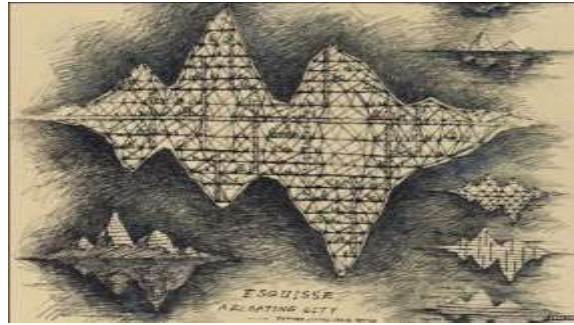
400 by 300 meters, 29 stories high
Capacity 10,000 guests
Speed: 1/4 that a cruise ship
Able to withstand 20-meter waves



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The Nomadia is to accommodate 3000. For sailing, ballasts are pumped out, reducing the draught from 20 meters to 11. Propulsion is by a set of azimuthal and retractable pods.

Zhao Xie's living spaces within an iceberg-like floating islands



Streets of Monte Carlo "reflects the style and sophistication of the principality" and includes a functional go-kart track in the spirit of the Grand Prix circuit.

The go-kart track, we believe, represents the low point in futurism.



Conceptual Islands by Locations

Some schemes have a particular site in mind, New York Bay, for example, in "Why Not a Floating Hotel?" New York Weekly Magazine, July 14, 1866.

The island is about a half-acre in extent, and for many years has floated on the surface of the water, being occasionally anchored to the bottom of the pond by the roots of some of the trees which have gone through the island and caught in the ground beneath. Recently a freshet raised the island, and broke these roots, and it floated across the pond, driven by the wind. The surface of the island is strong enough to bear a loaded team.

That island may do very well for a young married couple without children -- nothing beyond that. Now if Governor's Island could only be persuaded to loosen itself from the bottom of New York Bay and float about promiscuously, a regiment of three months' men and women could be speedily recruited for boarders at this season. Think of it once more, if you like. What hops!

*What flirtations! What sonnets to "the sea, the sea, the open sea!" What bathing! What boating!
What fishing!*

*The dolphins, the halibut, the bass, would jump from the ocean wave into the arms of the hotel
guests. Surely we are a slow people, not to have had a floating hotel ten years since.*

Félix Romeo, in "En Una Isla Flotante," Letras Libres, October 2012, envisions development
along Catalonia's Rio Ebro.

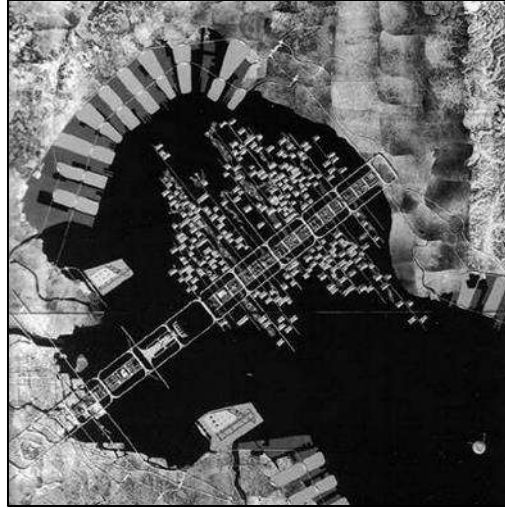
*A neighborhood that is on both sides of the river. The neighborhood would be joined by a
floating island where the common infrastructure would be built: a health center, kindergarten, a
cultural center, a playground and a market. People would have easily access the island from
the two banks, park spaces divided by water, and share common spaces in the floating island.*

*The idea of the floating island occurred to me in Edinburgh, or rather, came in Edinburgh
because Natalia thought that Edinburgh's large central park between the Castle and the zone of
the development seemed to hover in the air.*

*A neighborhood that is at the same time on both sides. About the Ebro a sort of floating island
where services are provided. I had not expected to have a police station, but it can still be
included.*

What should the pirate who touches my floating island be called?

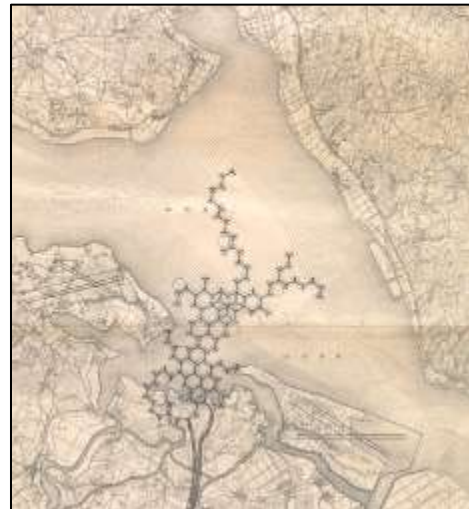
In 1960, Kenzo Tange and others presented a plan to house millions of people over Tokyo Bay on an 18-kilometer "civic axis". The floating "pagoda" could be multiplied at will.



"Expansion of Metroplital Tokyo, 2025," by Kisho Kurokawa, 1987



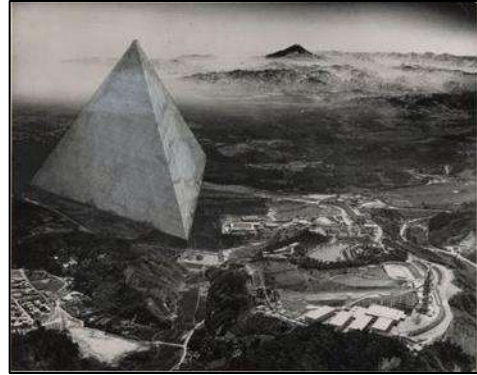
"Floating City" (1961) by Kisho Kurokawa conceives of lake-surface housing as part of the development of Narita International Airport. Roof-top motorways and walks interconnect the modular structures, each of which has its own harbor. A spiral escalator provides vertical transportation between rooftop and water transport, "spiral" being an embellishment that sounds snappy.



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Commissioned by a Japanese client in the early 1960s, Buckminster Fuller designed a tetrahedron floating city to be built in Tokyo Bay. The structure's base would be 3.2 kilometers; its height, 2.3 kilometers. It would house 100,000 people.

How to float the gargantuan pyramid appears not to have been in the commission.



The Dymaxion World of Buckminster Fuller (1973), by Fuller and Robert Marks, explains some of Fuller's thinking.

We find that a tetrahedral city, to house a million people, is both technologically and economically feasible. Such a vertical-tetrahedral-city can be constructed with all of its three hundred thousand families each having balconied "outside" apartments of two thousand square feet of floor space. All of the machinery necessary to its operation will be housed inside the tetrahedron. It is found that such a one million passenger tetrahedral city is structurally efficient, and therefore so relatively light, that together with its hollow-box, sectioned, reinforced concrete foundations it can float. Such tetrahedral floating cities would measure two miles to an edge, and can be floated in a triangularly patterned canal. This will make the whole structure earthquake proof.

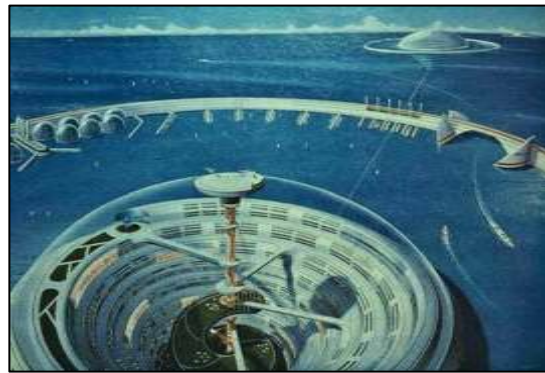
The whole city can be floated out into the ocean to any point and anchored. The depth of its foundations will go below the turbulence level of the seas so that the floating tetrahedral island will be, in effect, a floating triangular atoll. Its two-mile long "boat" foundations will constitute landing strips for jet airplanes. Its interior two-mile harbor will provide refuge for the largest and smallest ocean vessels.

Pipe-dreams left on the drawing board tend to be the rule -- not the exception -- for floating cities, but when we return to Fuller in Chapter 76, we'll see where this went.

Other architects have likewise applied their imaginations to construction in Tokyo Bay, but although the representations are often interpreted to be of floating islands, the conceptual projects rest on piers.



Pearl Shell, Osaka Bay, by Shimizu Corporation



Marine Uranus, by Nishimatsu Corporation

The Republic of Kiribati in the central Pacific is comprised of 33 atolls and reef islands and one raised coral island. The nation's 800 square kilometers of surface, none of it more than 2 meters above sea level, cannot sustain its population of about 100,000.

Japanese construction giant Shimizu Corporation visited Kiribati in 2013 to discuss concepts and display models of a floating future.

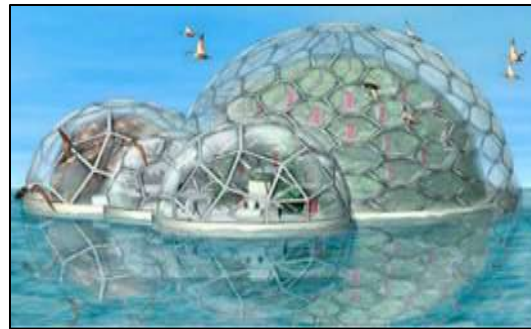
Each island, tethered to the ocean floor, will be nearly two miles across, with a central tower rising half a mile to form a "city in the sky" for 10,000 inhabitants, along with forests, beaches, vegetables and fruit cultivation and port facilities. Single islands can be connected to form floating cities.



"The idea behind the Green Float project was first as a solution to the problem of a rapidly growing human population or as a city that would be immune to earthquakes and tsunamis," said Masayuki Takeuchi, the head of the scheme. "But we quickly realized that it could save islands from rising sea levels."

The \$500 billion estimated cost is roughly 3,000 times the nation's GDP

Shanghai Expo's Floating City never materialized, but had this vision for a floating city been constructed, it would have been the most eye-catching display at the 2010 Shanghai Expo. Designers envisioned an eco-friendly series of honeycomb semi-spheres floating on the Shanghai River, packed with a 3D cinema, pubs, a shopping mall and a restaurant.



Chinese floating city, AT Design, 4 square miles of equilateral triangles and a pentagons assembled from prefabricated modules floated to the site.



The 5 Lagoons Project in the Maldives, an 80 million square feet project, will include 185 \$1-million waterfront homes connected along a flower-shaped quay.



"A Floating Metropolis for Startups," [CNET](#), July 3, 2012, by Jennifer Haley

Imagine a floating city of entrepreneurs; a veritable Googleplex of the sea. That's the vision behind Blueseed, a San Francisco startup.

The company plans to deploy a cruise ship 12 nautical miles from Silicon Valley -- in international waters -- and convert it into a metropolis of floating offices so foreign workers can launch their companies without obtaining work visas.



The ship will have pools, massage areas, gyms, rock climbing walls, and indoor soccer fields according to Marty. His model is very Google-esque--the fostering of creativity through colors, aesthetics, and food.

Commentary: "A Floating Island of Nerds... Or Just Evidence of a Broken Immigration System?" [Startup](#), July 9 2012, by Mike Masnick

But, of course, you're still stuck on the boat. And while there will be ferries back and forth to the mainland, I'm not entirely clear on how those foreign workers get there in the first place.

Just the fact that someone needs to float the idea (pun only slightly intended) of putting a cruise ship offshore to help startups find reasonable talent highlights the nature of the problem, even if the cruise ship never sets sail. We're fundamentally turning away talent that grows the economy and creates jobs. From a policy perspective, from an economic perspective and from a moral perspective, it makes no sense.

The Jounieh Floating Island Resort is a five-star hotel of 3,400 square meters, including 64 rooms, 80 cabins and roof-top restaurant, proposed for Jounieh Bay, Lebanon.



"Floating island Project in the Bay of Jounieh, Lebanon," 2014 seminar, Universidad Nacional Autónoma de México

Rooms, cabins and a restaurant aren't enough, however, as evidenced by "Jounieh Rejects Floating island," Daily Star, June 10, 2014,

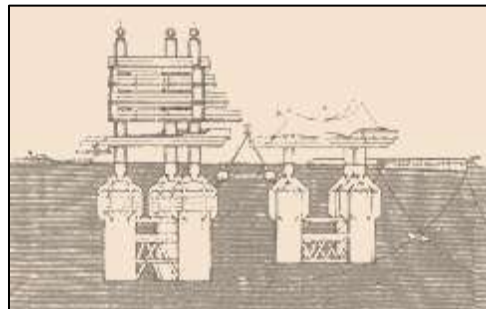
The world's "first floating island," currently under construction and destined for Jounieh Bay, has been rejected by municipality officials as incompatible with the seaside resort town.

"There is no place for the island in Jounieh," Mayor Antoine Frem told The Daily Star, adding that the municipality did not have the capacity to accommodate the island's guests.

"A project of this caliber needs to be constructed in an area that does not have a dense population" Frem said, stressing that the project would require infrastructure and a large number of parking spaces.

The mayor also raised environmental concerns, pointing out that mechanisms for waste and sewage management had yet to be resolved.

Sea City, a floating North Sea community of 15,000, would employ semi-submersible units arranged in a circle, in which narrow columns supporting platforms above the water reduce hydrodynamic forces from waves.



Enthusiastic publicity from TV21 Annual, 1971,

Inside the egg-shaped outer wall, sixteen tiers of gleaming, glass-fronted houses curve dramatically down to the smooth surface of the water. Their glittering lights reflect like a fireworks display on this sheltered lagoon. Dozens of triangular buildings float gently on the water, strung together by pedestrian walk-ways at first-floor level. All around us we see

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shopping centers, schools, churches and green parks. Sleek little water-buses dart about like dodgems at a fair.

The islands inside the lagoon would comprise of six triangles, each 120 feet long with flood tanks to keep the sections level according to the building load carried.

The biggest attraction of all is the Marine Zoo, an extra-ordinary place built half under the water, where we can watch strange creatures of the sea living in their natural conditions. Sea City is a wonderful place for Mum and Dad, too. Gleaming shopping arcades span the south side of the city, all under cover so that Mum doesn't get wet when she's staggering home with the week's provisions on a rainy day.

All around the city, except for a gap to let ships through (just like a drawbridge), stretches a line of sausage-shaped canisters. These are positioned at some distance from the wall, and being part-filled with fresh water float low in the sea. They are enough to break the back of the giant waves coming crashing in, reducing them to harmless ripples by the time they reach the wall.

Consafe Offshore of Sweden has constructed a simpler semi-submersible unit for North Sea oil operations, including a fresh water supply, sewage treatment, medical facilities, recreation rooms, kitchens, a bakery, a mess hall. Chapter 70 notes other off-shore rigs of similar amenities.

Marine engineer John Craven and architect Kiyonori Kikutake promoted a floating exhibit for Hawaii's 1977 marine exposition, "Ocean Expo," a structure to be later expanded into a 1 to 2-mile-diameter, 2 to 10,000-person community with a 3-tiered 13-storied arrangement of buildings above the waterline and industrial and manufacturing levels below.

Pulleys moored to the ocean floor would rotate the city and move it along a 5-mile tract. One could watch the sun sink in the west and rise in the east from the same hotel room.

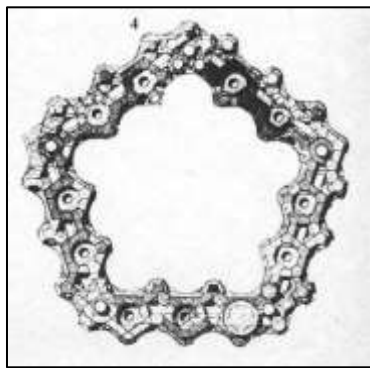
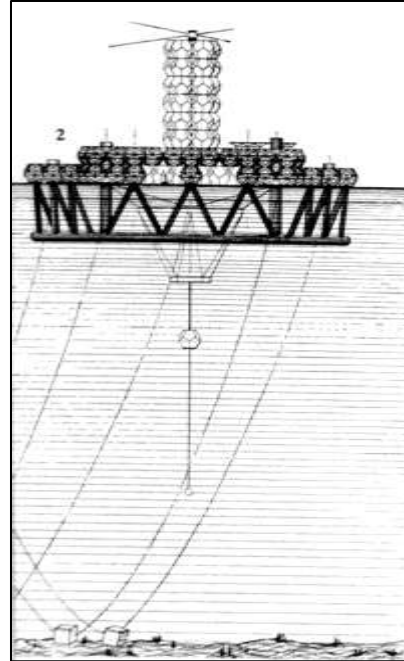
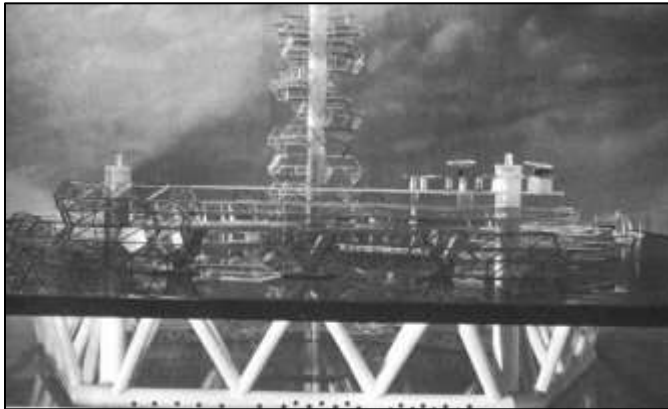


According to Craven,

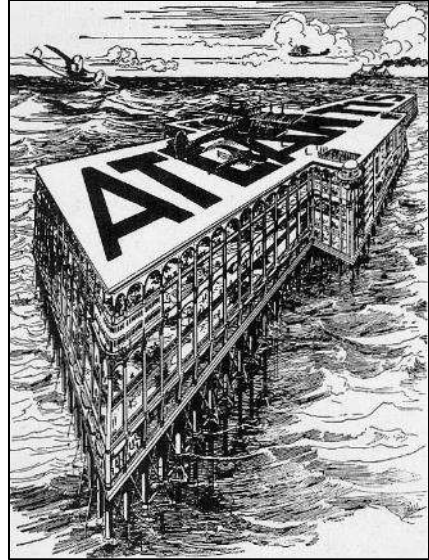
Since the main deck would be 30 feet off the surface, it would be completely stable, unaffected by waves or rough water. Seasickness would not be a problem.

So far, it just another idea, one of many. But as we will see in Chapter 76, this floating city got tested.

Edouard Albert and Jacques Cousteau's "Artificial Island for the Bay of Monaco," 1966



Additional ideas for specific sites, beginning with the Floating Atlantis Hotel, 1928, a hotelier's expansion of the era's enthusiasm for floating mid-Atlantic airports (Chapter 57).



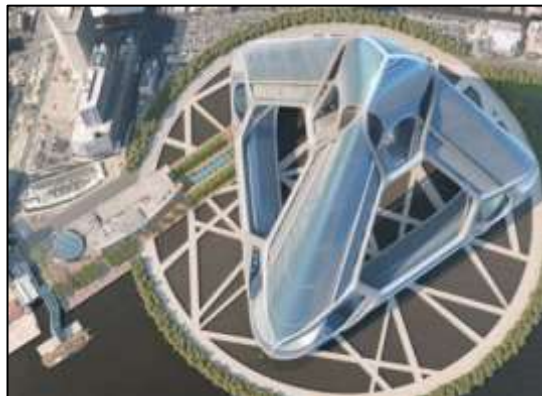
Floating City of IJmeer, Netherlands, by Rutger de Graaf, Michiel Fremouw, Bart Van Bueren, Karina Czapiewska and Maarten Kuijper



Boston Archology, by Kevin Schopfe



Embassy of Drowned Nation, Sidney



New Orleans Archology

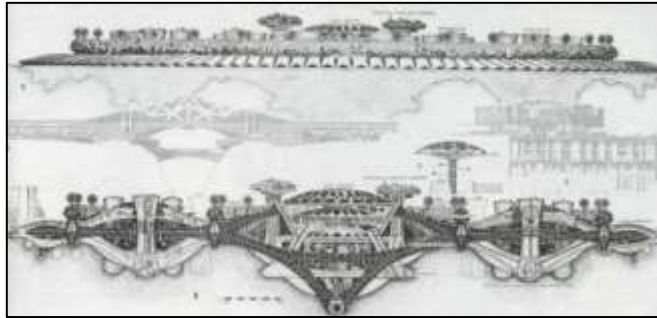
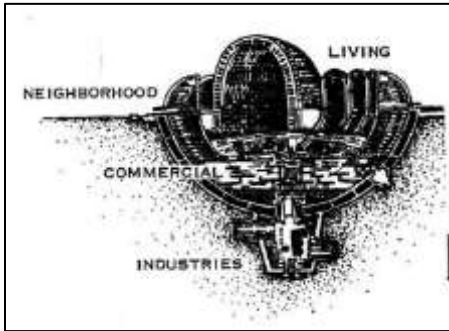
The Aquarius Project, based on the book *The Millennial Project* (1992), in which Marshall Savage proposes building a tropical floating island using a method not unlike that used by living coral, would provide lessons useful in construction of colonies in space.

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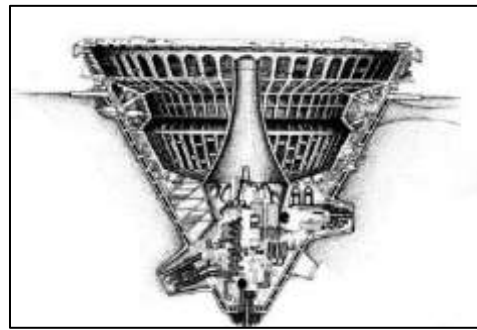
Conceptual Floating Islands

A few concepts not related to location,

Below, concepts by Paolo Soleri. To the left, a structure in which the commercial and industrial enterprises would be below the water line. To the right, Novanoah 1, 5.5 kilometers in diameter, partially submerged and with 400,000 inhabitants.



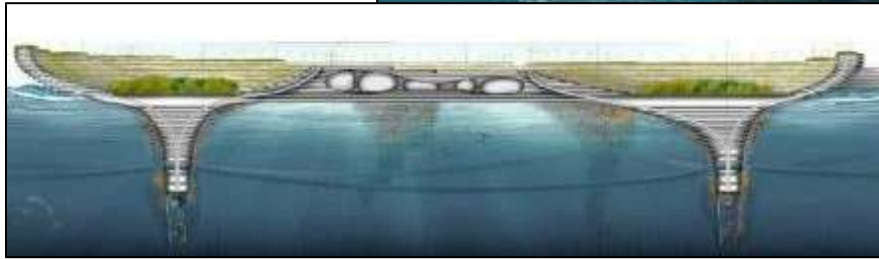
A module of Soleri's Novanoah II



The Gyre: Floating Oceanic Skyscraper



Noah's Ark, by Aleksandar Joksimovic and Jelena Nikolic, features lake-like depressions collect and rainwater. Wind provides the energy. Tidal power generators below the structure boost energy production, though as the generators remain at constant depth below the surface, it's unclear why water would flow through them.



Venus project by Jacque Fresco, 2014



Oceania, by Atlantis Project



White Lagoon, by Waterstudio.NL



Floating Island Villas, by WHIM Architecture, constructed from recycled plastic.



Disney's Sea City of the Future, a 1964 projection of architecture in 2050



Sea City 2000, Future Cities: Homes and Living into the 21st Century (1979 by Kenneth Gatland and David Jefferis)



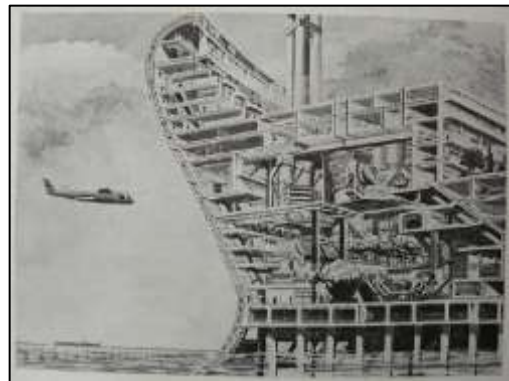
The Ark by Alexander Remizov



Floating island on the Adriatic



Marine City by Hal Moggridge, 1968



The 1993 plan for a vast floating Oceania City off the coast of Panama appears to be a resurrection of Matrine City, above. . The founders took out an ad in Reason, a libertarian periodical.

Some time ago, the Pilkington Glass Company, one of the most respected and long enduring enterprises in England, and, indeed, the world, developed a concept to construct a city on the sea. Its suggested location was in the North Sea, one of the stormier areas of the globe.

We have researched this concept and have contacted companies who have actually constructed floating hotels, floating military quarters for soldiers and sailors, oil platforms, etc. The results show that a sea city is feasible and, since no land costs are involved, can provide first class condominiums and other housing for substantially lower prices than can be obtained in many of our cities.



Our city will include all amenities, including small parks, theaters, schools, shopping facilities, sports facilities, and ports for STOL airplanes, helicopters, and ships.

Using this futuristic concept we can break the chains which bind us to land, together with the chains that bind us to the system of government which has become perhaps irreversibly entangled in bureaucracy, corruption, and the free lunch philosophy. Forget the old fashioned idea of leasing land from another country, let us create our "land" instead.

In our new country, OCEANIA, we can practice genuine free enterprise, enjoying true freedom in the tradition envisioned by Von Mises, Hayek, and Rand.

The project was disbanded the following year due to lack of interest and funds.

Shimizu's Green Float project seeks to build "botanical" cities 3 kilometers in diameter supporting a population of 40,000 in the equatorial Pacific.

Each floating island features a 1,000-meter central tower, the lower section of which serves as an industrial area, while the upper section functions as a residential area. Other residents -- presumably the owners and managers -- dwell in low-rise townhouses near the beach.



Celestopea Sea Domes have smooth, curved outer shells, in contrast to the interconnected, flat triangles that compose the shape of the more common geodesic dome.

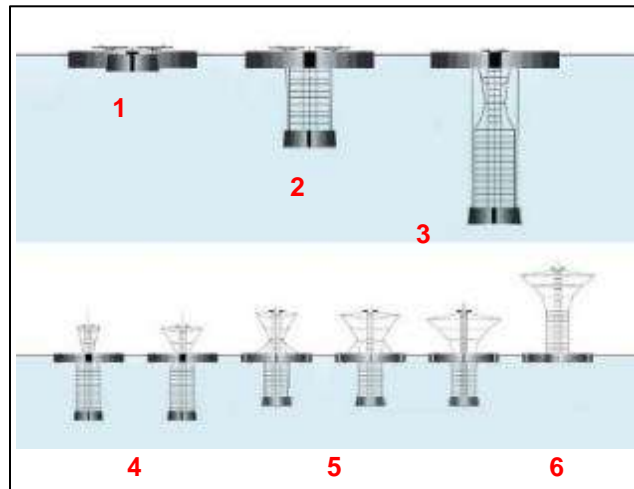
Sea Domes will be made of ferrocement, but with time, calcium carbonate dissolved in seawater will be accreted into the shape of Sea Domes similar to the way a shellfish creates its shell.



The islands are to be built upon a floating base of bonded hexagonal magnesium tubes, each 7000, 20 meters across and 50 meters high. Individual honeycombs are produced on barges, turned on end and set afloat. As a layer of the structure is completed, it is submerged. Once the top level is is, the entirety is dewatered and lifted by its buoyancy.



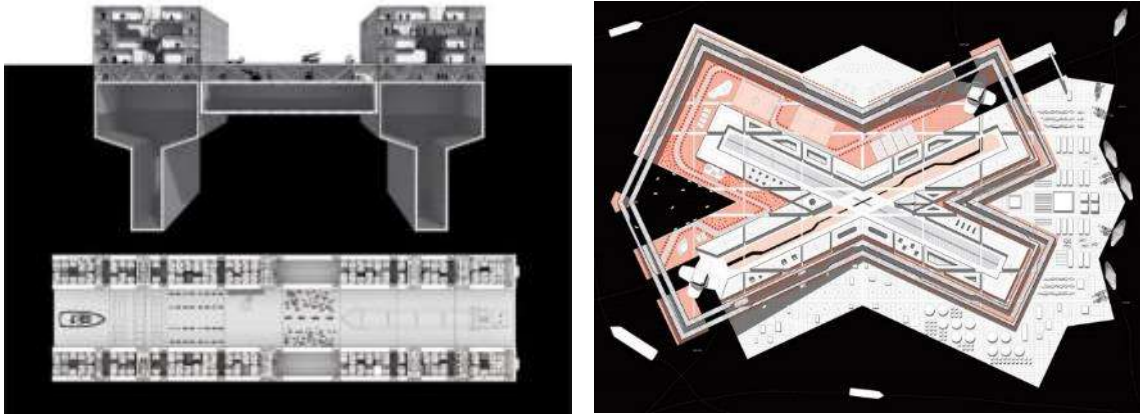
1. Construction of begins.
2. Structure completed on surface platform lowered on flotation device.
3. Erection of the main structure completed. Cranes dismantled.
4. Structure raised using cables and temporary flotation devices.
5. Beams connected to the upper portion removed. Portion above central joints expanded using cables.
6. Pillars of the curved portion extended to final position. Support beams for the circumference erected.



TROPOS proposal, "The Ocean of Tomorrow," European Union, 2011.



The 2012 Odebrecht Award for Sustainable Development: "Floating Archipelago of Self-Sufficient Man-Made Islands" by Rice University students Joanna Luo, Weijia Song, and Alexander Yuen, with advising professor Neeraj Bhatia, the top prize for the most innovative sustainable architectural, chemical, or engineering idea, a 600 kilometer chain of man-made islands supporting a population of 50,000, crops, and schools. The islands leave no environmental footprint when removed.

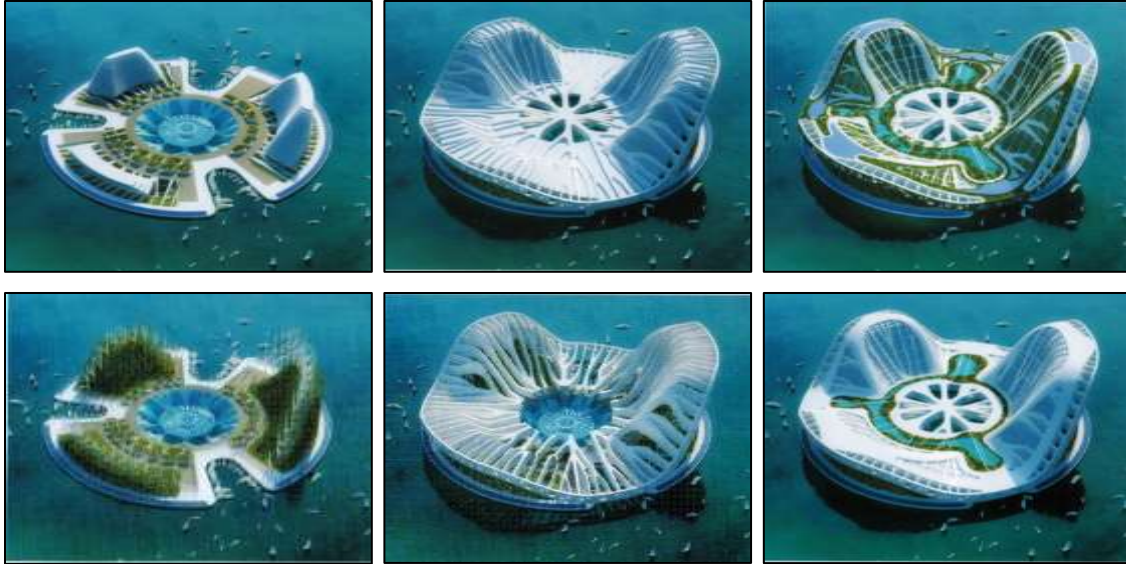


We end our futuristic voyage with the "Lilypads" of Vincent Callebaut, exceptional for their settings.



Lilypad design, growing in organic fashion

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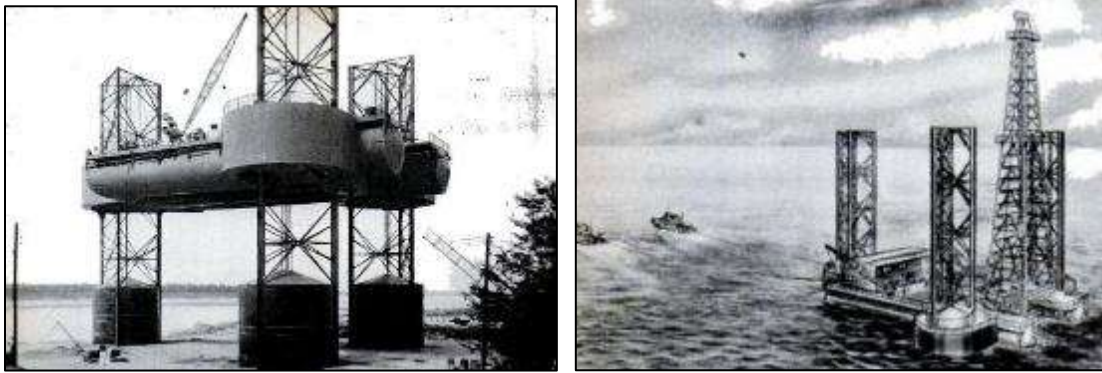
CHAPTER 71

POWER UP

Extraction

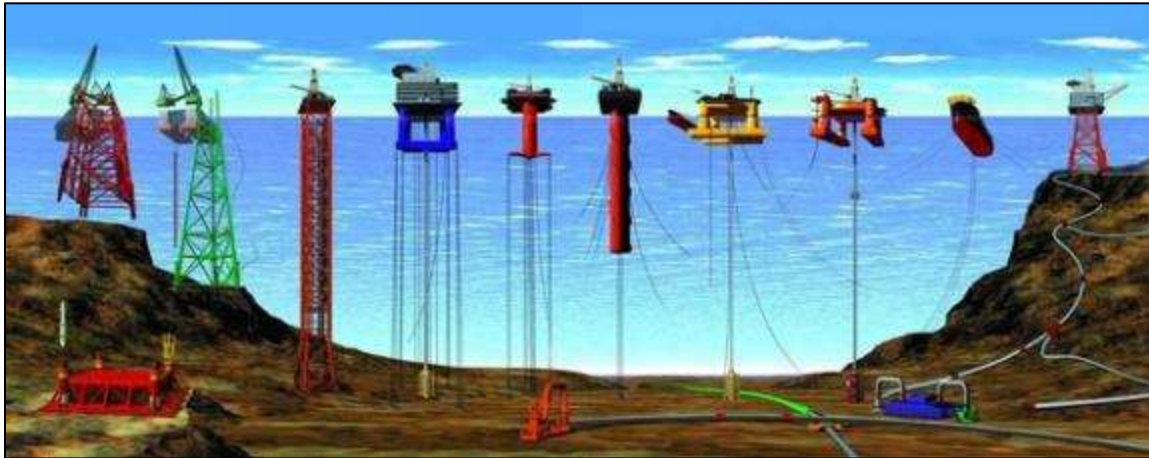
Marine structures for oil and gas production resemble massive mechanical islands, though whether they're floating or set upon the seabed depends on their type.

Before we appraise the massive petroleum-extraction floating structures of today, it's of interest to see what was in the plans not that long ago. From "Floating Derrick to Drill Oil, Move On to New Gulf Site," Popular Science, January 1956



This 4,000-ton floating island will range the Gulf of Mexico's oil-rich fields. Equipped with a derrick, it will be towed (as in drawing at left) to a likely offshore site to drop its 140-foot legs to the Gulf floor and drill as deep as three miles. One job done, it will pull in its legs and be moved to another spot with equipment and 42-man crew housed on its half-acre deck. Texas builder LeTourneau, Inc., puts its cost at approximately that of one stationary platform -- \$2,000,000.

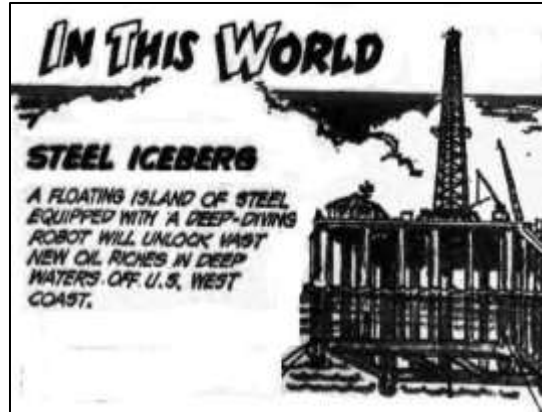
The labeling below includes example illustrations of more-recent structures, but the drawings are generic.



<p>Conventional fixed platform Shell's Bullwinkle, 412 m</p>	<p>Compliant tower Chevron Texaco's Petronius, 534 m</p>	<p>Vertically moored tension leg and mini-tension leg platform Conoco-Phillips' Magnolia 1425 m</p>	<p>Spar Dominion's Devils Tower, 1710 m</p>	<p>Semisubmersible Shell's NaKika, 1920 m</p>	<p>Production, storage and offloading Shell's Bullwinkle, 1345 m</p>	<p>Sub-sea completion tie-back to host Shell's Coulomb tie to NaKika, 2307 m</p>
------------------------------------------------------------------	--------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------	-------------------------------------------------	---------------------------------------------------	--------------------------------------------------------------------------	--------------------------------------------------------------------------------------

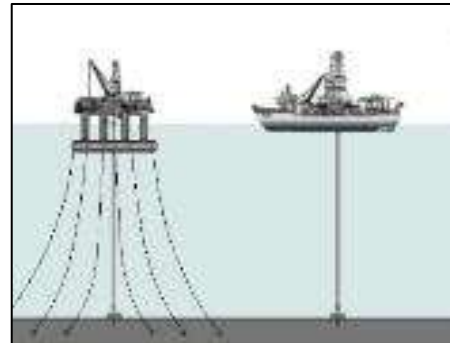
We'll concentrate on rigs from the center of the graphic, those that float.

The September 4, 1954, Portville Star "floating island of steel" illustrates the anticipation of such technology.

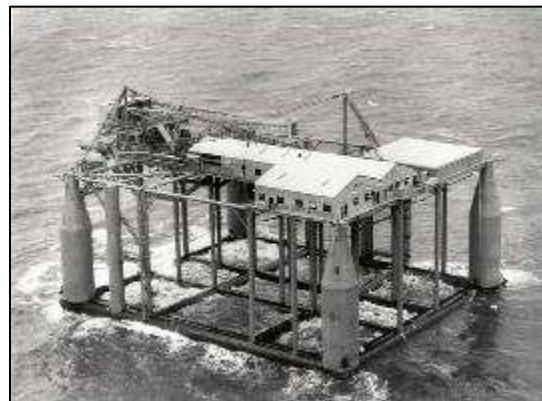


Semisubmersible vessels are used for drilling in depths exceeding 500 meters. With its hull structure submerged at a deep draft, the semisubmersible is less affected by wave loadings than is a normal ship. Ballast and buoyancy chambers are trimmed to maintain stability. Lateral stability is achieved by propellers built into the rig itself.

Comparison of semi-submersible and drillship.



Blue Water Rig No. 1 was a four column semisubmersible rig in the Gulf of Mexico towed between locations at a draught midway between the top of the pontoons and the deck underside





Thunder Horse, the world's largest moored semisubmersible oil platform, 1,920 meters in the Gulf of Mexico. Construction cost was approximately \$1 billion. The facility is expected to operate for 25 years, producing 1,000,000,000 barrels of oil



But lest we place too much trust in floating islands as our energy white knight, the July 200 collapse of Thunder Horse in the Gulf of Mexico.

A few more semisubmersibles:



Rig on MS3 Heavy-lift Ship



Saipem Scarabeo 7 docked in Cape Town



Iolair on Elbe river



Thialf in Norwegian fjord with Single Anchor Leg Mooring buoy



Deepsea Delta in the North Sea.



Brazilian Petrobras P-51



Perdido, 2450 meters in the Gulf of Mexico



Olympus, a tension leg platform production facility, will be moored from each corner.

Royal Dutch Shell's Floating Liquefied Natural Gas Facility, to be situated 200 kilometers off of Western Australia, is due for completion around 2017. It is expected to be approximately 488 by 74 meters with displacement of around 600,000 tons, equivalent to six aircraft carriers,

A few rigs in tow



Statjord "B" oil platform off of Norwegian coast

Troll, a natural gas platform off the west coast of Norway, 1.2 million ton ballasted under 174-mile tow, 472 meters high, 369 meter underwater concrete structure, and a dry weight of 656,000 tons.



"Paul Romano" bound for Malta



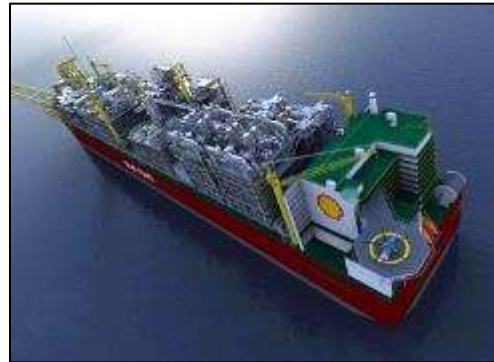
Spartan jackup arrives in Homer

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The Mars tension leg platform. We'll have more to say regarding tension legs in Chapter 73.



Floating above an offshore natural gas field, the Prelude Liquefied Natural Gas Facility will extract, liquefy, store and transfer LNG to carriers. Nearly 500 meters long, its displacement will be about 600,000 tons.



Artist's conception

Submarine drilling for another purpose, Project Mohole was a 1960's attempt to retrieve a sample of material from the earth's mantle by drilling a hole through the earth's crust

The proposed drilling platform consisted of three decks, 279 feet long and 234 feet wide, 135 feet from keel to upper deck, with the drilling derrick towering 240 feet higher

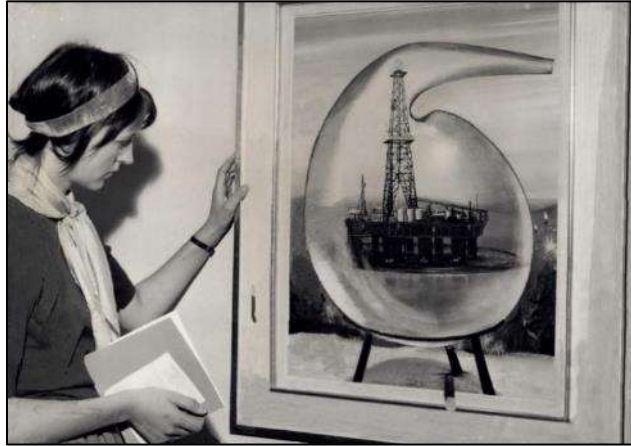
Six vertical columns, 88 feet long and 31 feet in diameter would extend to twin submersible hulls, each 390 feet long and 35 feet in diameter.

Mohole never got off the drawing board, however, abandoned by Congress.



And it's not just engineers who are drawn to the subject of oceanic drilling..

"A Floating Island" by Pierre Le Colas, Musee Galliera exhibition, "Oil Fields, A Source of Inspiration for Artists," Paris, 1959.



The 19,000-ton Transocean Winner semi-submersible blown ashore during towing off the Isle of Lewis, August 9, 2016

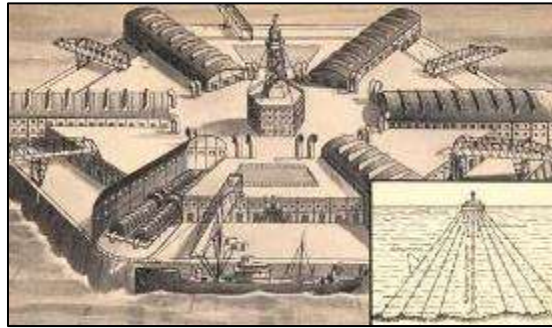


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Generation

Floating islands situated near markets, at least at the conceptual level, are attractive for energy production

A 1930s French scheme for a 600 meter floating marine power plant.



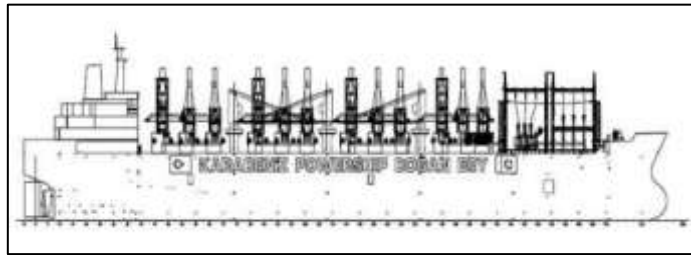
Munguba, Brazil floating structure constructed in 1978. One section is built for a pulp plant (230 by 45 by 14 meters) while the other section is for a power plant (220 by 45 by 14). It was towed to its site as a floating structure but was installed on piles.



Jamaican diesel power barges



Swiss energy company Viteos is developing three floating solar arrays on Lake Neuchâtel. Each island will sit on a 25-meter inflatable ring, support 100 photovoltaic panels positioned at a 45 degree incline. The entire island will be anchored to the lake-bed and rotate 220 degrees in the direction of the sun. A prototype was launched on land in Abu Dhabi in 2009.



The engineless Doğan Bey, a converted bulk carrier, 188 meters in length, 31 meters in width and 25,000-ton displacement, converts refined petroleum into 125 MW of electricity for Iraq. The Karadeniz Corp. operates seven such powerships.

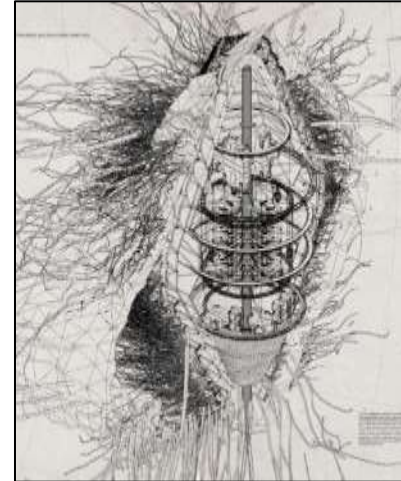
The Future

Ocean thermal energy conversion (OTEC), a process in which cold water is pumped from the ocean depth to generate electricity by means of a heat exchanger. The greatest temperature differences occur in tropical seas where the surface water is around 25 degrees C.

The first OTEC plant, built in 1930 on a Cuban shoreline, produced 22 kilowatts of power. Only a handful of other facilities (both floating and land-based) have been constructed since, with the largest being a 250-kilowatt plant in Hawaii. None are currently operating.

The "Iceberg Autonomy" proposed by Akram Fahmi in 2011 to be a drifting territory of temporary autonomy occupied by a maritime miners and refiners harvesting oil plumes in the depths of the polar gyres where the majority of oil spills have occurred.

It's a floating island to fix problems caused by other floating islands,



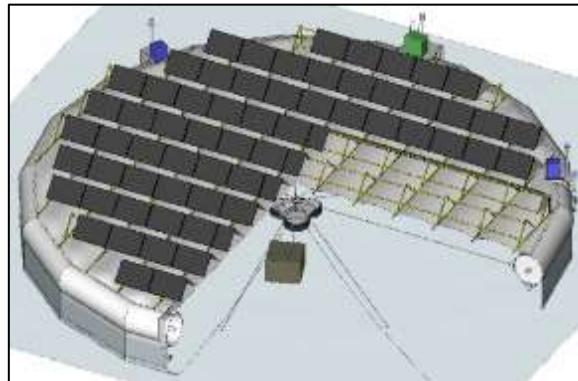
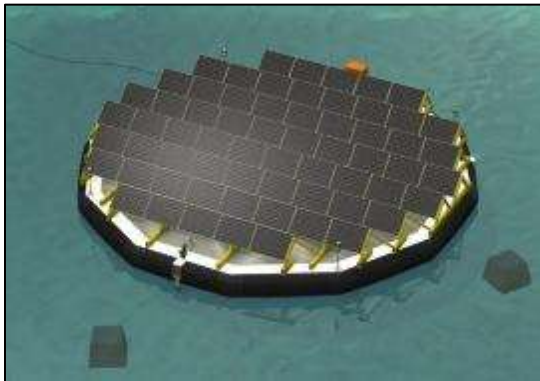
To reduce reliance on nuclear power, a 70-megawatt solar island opened on Japan's southern coast in 2013.



Kyocera Corp. and Century Tokyo Leasing Corp. are partnering to build two massive solar power islands that will float on reservoirs. One plant will be on the surface of Nishihira pond and generate about 1.7 megawatts. The second will be on Dongping pond, 1.2 megawatts. Work is set to be completed by mid-2015. The joint venture aims to eventually churn out 60 megawatts of solar power from 30 floating stations.



Three floating solar islands are planned for Lake Neuchâtel, Switzerland. Each island will measure 25 metres in diameter and can rotate 220 degrees.

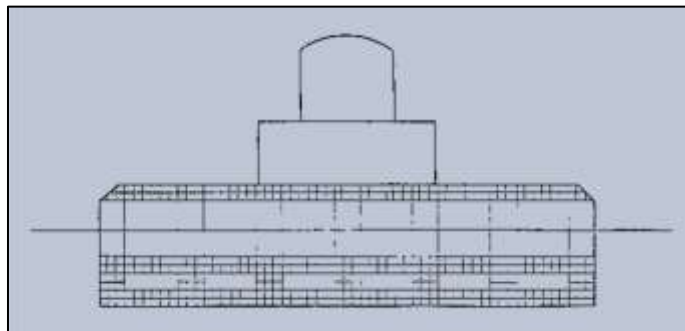


Or How About a Small Nuclear Reactor? From "Floating 'Island' to Aid Arctic Scientists," Popular Science, October 1966,

A man-made floating island large enough for helicopter and airplane facilities, a hospital, shops, laboratories, housing, and other structures is being studied by several companies under contract to the National Science Foundation. The island, or drift hull, would house 45 scientists and a crew, and would be towed through the Bering Straits into the Arctic Basin to drift toward the North Pole. The hull may include a nuclear power plant, and will make use of waste heat or steam to melt ice gripping it. The island would enable scientists to study such subjects as meteorology, oceanography, marine biology, and sea ice.

A 285 by 285-meter 1250-MW floating power plant from Islands for Offshore Nuclear Power Stations (2012), by Binnie & Partners.

Five-meter cubical concrete cells form the outer skin of the island. Internal cells can be up to 20-meter cube depending on deck and access requirements. Cylindrical cellular units allow thinner wall thickness, but would have to be stiffened by additional longitudinal and transverse diaphragms





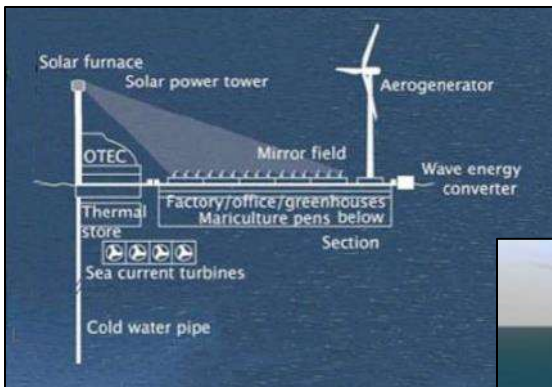
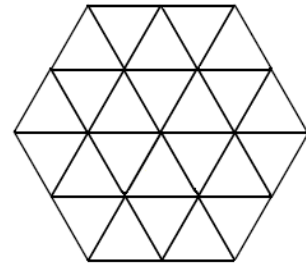
The floating nuclear power station Akademik Lomonosov has a length of 144 meters, a width of 30 meters and a displacement of 21,500 tons. Two modified naval propulsion reactors provide up to 70 MW of electricity or 300 MW of heat. The vessel is expected to be deployed in 2016.



For comparison, a Nimitz-class aircraft carrier is somewhat over 1,000 meters in length and displaces more than 100,000 tons. Its nuclear power plant produces about 190 MW

Hexagons

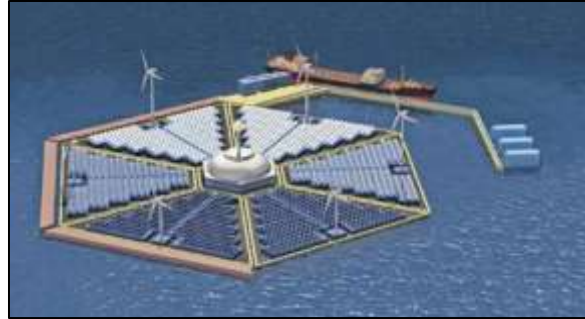
Modularly-constructed floating islands, particularly those which may be further enlarged, can take advantage of the fact that equilateral triangles can combine to form a hexagon and hexagons can be combined to form a greater surface. The geometric concept has been proposed a number of times for floating energy islands.



In "How Floating 'Energy Islands' Could Power the Future," LiveScience.com, November 12, 2008, Michael Schirber describes a 600-meter-wide, 250-megawatt floating island, likewise utilizing solar, ocean temperature gradient, wind and wave energy, another island of techno dreams



A conceptual energy farm drawing solar, wind, wave and heat-exchange power.



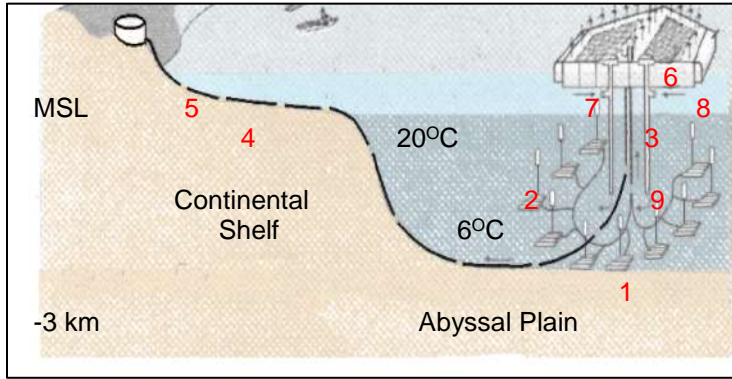
E. Watanabe, C.M. Wang, T. Utsunomiya and T. Moan, Very Large Floating Structures: Applications, Analysis and Design (2004), CORE Report No. 2004-02, Center for Offshore Research and Engineering, National University of Singapore, notes two such proposals.

Concept Design of a Clean Energy Plant by Floating Structure Association of Japan

Below, Focus A and B, by Japanese Society of Steel Construction, named after the two foci of the elliptical bay of Osaka



"Floating, High-Capacity Desalting Islands on Renewable Multi-Energy Supply," Desalination 177 (2005), by Pieter Stuyfzand and Joost Kappelhof, proposes an artificial, moored floating island, hexagonal in shape, 0.1 to 1 kilometer in diameter and 20 meters deep, 10 to 100 kilometers from shore



- 1 - Submarine reverse osmosis units
- 2 - Submarine balloon with water intake
- 3 - Desalinated water storage
- 4 - Desalinated water pipeline
- 5 - Storage reservoir
- 6 - Wind turbine
- 7 - Solar energy collecting systems
- 8 - Wave energy conversion system
- 9 - Hydrothermal energy converter

The floating island is laden with high-cost technology of questionable workability.

A seawater desalination plant consisting of plastic sheeting mounted on floats, which creates a greenhouse effect and water vapor, and collects the purified water vapor driven by wind, wave and solar power through a submarine condensation chamber.

Wind-driven reverse osmosis desalination.

Subterranean reverse osmosis using hydrostatic pressure.

Desalination by harnessing the hydrothermal gradient.

All in all, another floating island of engaging ideas, technical breakthroughs and economic implausibilities. But always food for thought.

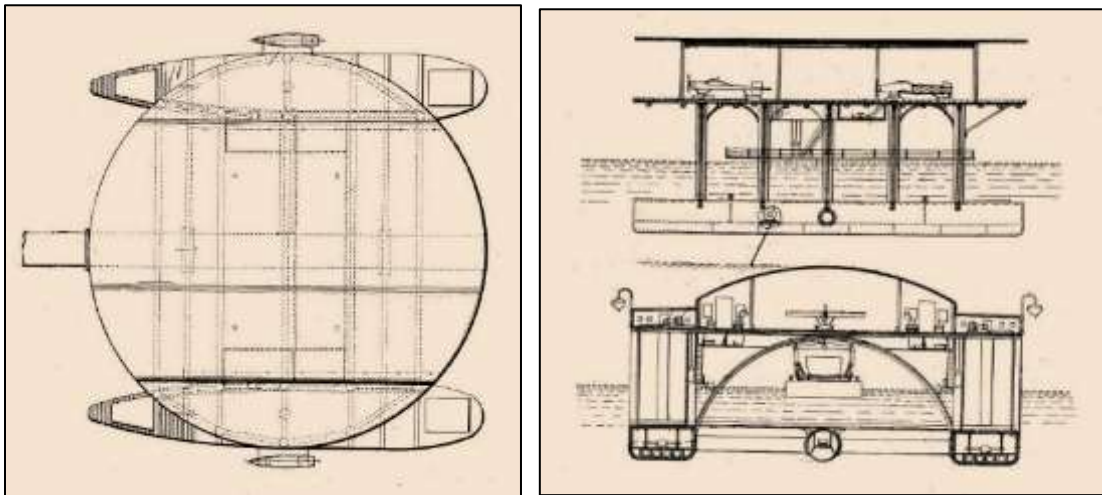
CHAPTER 72

DOCK

Because floating piers and dry docks tend to be far larger than floating islands of the garden variety -- the adjective broad or specific, they both work -- we include docking our vessel to a floating pier or dry docking for maritime maintenance as things to do on a floating island..

Piers and Docks

The basic idea, "Landing Stage for Vessels and Land Vehicles," U.S. Patent 1,334,445 (1920) by A. Gaffney



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Floating structures are ideal for piers and wharves, as their elevations remain constant with respect to the waterline.

Ujina Pier, Hiroshima,
150 by 30 by 4 meters



Floating structures are suited for temporary docking because they can be deployed as needed.

A floating pier for drilling vessels,
Falkland Islands



The structure itself can be of simple or sophisticated construction.



A 6 by 6 feet, 250 pound home-made design. 4 drums, each providing 260 pounds of buoyancy.



An aluminum alternative

A few construction photos





One of two 31 by 110-meter concrete sections passing the bascule bridge in Tacoma, Washington in transit to Valdez, Alaska as a floating pier berthing 50,000-ton container ships. On arrival, the two units were post-tensioned into a single 220-meter dock and secured with eight concrete anchors.



The Monaco breakwater in tow from Spain, contains parking, a shopping mall and allows the docking of four cruise ships.



Below, in place and cross-section



Based on lesson learned from the 1973 and 1979 oil crises, Japan decided to construct 10 national oil stockpiles, two of which were to be floating.



Kamigoto Floating Oil Storage, Nagasaki, 5 barges, 390 by 97 by 27.6 meters, 4.4 million cubic meters, built in 1988



Shirashima Floating Oil Storage, Fukuoka City, 7 barges, 397 by 82 by 25.1 meters, 5.6 million cubic meters, built in 1996



Floating LNG Terminal, Argentina



Floating Coal Terminal, Indonesia

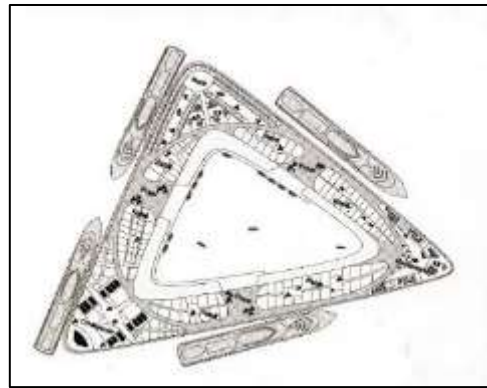


Conceptual Floating Container Terminal, Japan



Floating Bulk Transfer Terminal, United States

Cruise terminal concept, Dubai, 700 by 700 meters

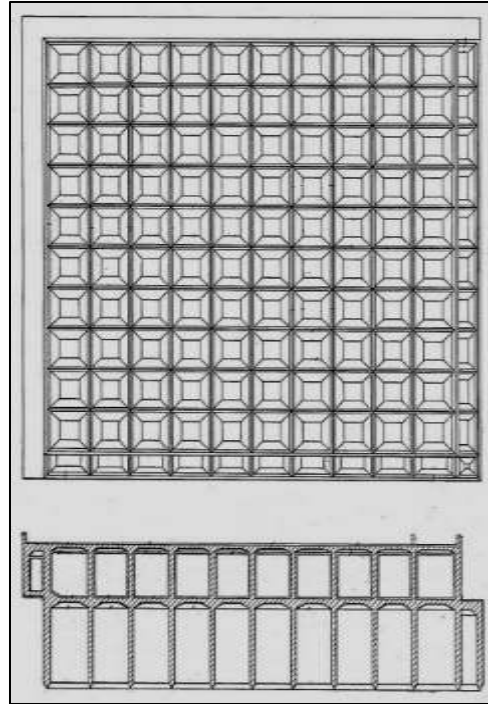


U.S. patent 1908714, "Floating Isle, Floating Bridge, Floating Dock, And Similar Construction," 1933, by A. Schneiderl, erroneously relies on the compressibility of water plus "the natural law of adhesion" to stay afloat. Needless to say, there has been no implementation.

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A concrete station adapted to float in water, and including a horizontally extending plate member, ribs depending therefrom and forming therewith a plurality of juxtaposed chambers opened at the lower ends thereof, and having rectangular cross-sections, said ribs having the lower edges thereof wedge-shaped, a second horizontally extending plate member spaced above said first plate member and forming the upper deck of said station, a plurality of chambers of rectangular cross-section conned between said plate members.

A horizontal surface area of dimension as required, is provided underneath in the water with rib carriers, adjusted in squares or rectangles, going deep down into the water. By the weight of the construction and the weight of the superload and sundry accessory constructions on the surface area, the water having been inspanned (enclosed) between the rib carriers, forming water cells, is more and more compressed, and consequently is made capable of bearing the load. Especially several yards in the depth of the sea, the water is pressed down (compressed) by its own (top) overweight and therefore possesses quite enormous carrying power.

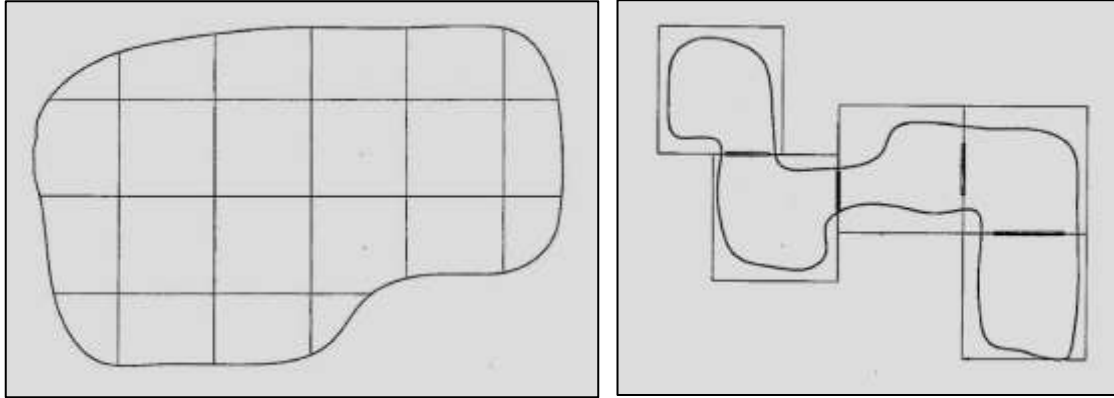


By the dimensional area on'the surface, in conjunction with the great number of. cells underneath, which reach far down into the water, while compressing by inspanning the water, further by the natural law of adhesion, which contributes in favour of, my construction, the effect is produced, that my construction cannot tilt or turn over. As is known the highest .billows in a storm have a limited depth down below, as soon however as the. rib carriers of the new construction pass beyond that limit, the constructed isle of my invention is secured quite safely.

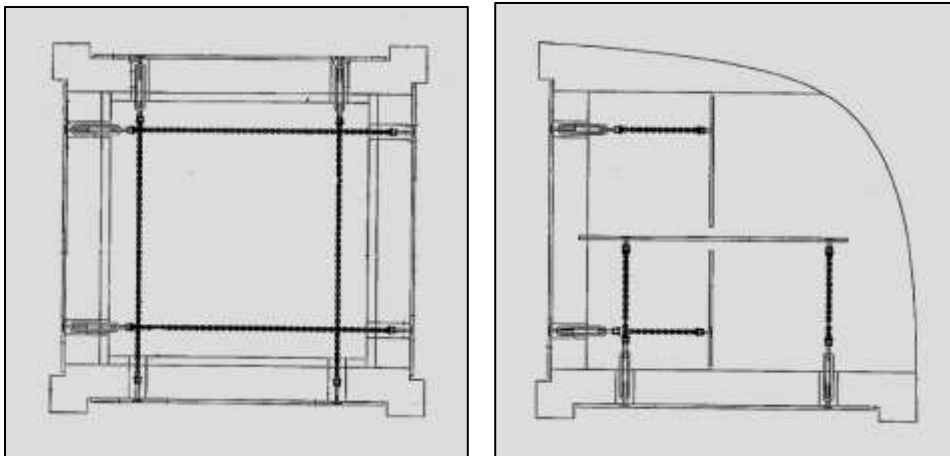
In keeping with the times (Chapter 57),

A floating isle can in this way be enlarged in all directions. By enlarging the size of the isle the erection of a light tower will become possible, further tanks for petrol etc. can be put up for supplying flying machines of all kinds. Besides the landing and ascending of airships and aeroplanes will thereby be made possible on the isle.

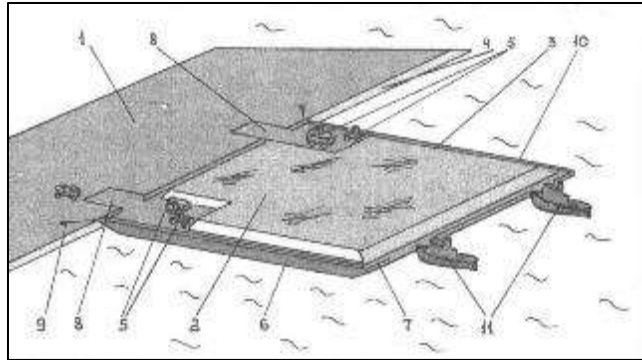
2011), by Bruce Kania, describes a dock-like structure comprised of buoyant rectangular modules, each of which is linked to its neighbors by a system of joiner plates and flexible tensioning members. The interior module are made in identical square configuration. Although the modules may theoretically be produced in any size, a typical module size is 5 feet long, 5 feet wide and 7 inches thick. Where a freeform is required, the perimeter modules are shaped to fit.



A group of connected modules may be selectively stiffened over a portion of the top surface or over the entire top surface by stiffening struts or decking runners. Below, plan views of a rectangular and freeform modules, showing turnbuckles and tensioning members



"Floating Island for Delivery of Inert Materials on Area of Water," Russian patent 2413816, can transport building materials to the construction site of a hydraulic structure. The complex consists of modules filled with a "light filler" and combined by mutually-perpendicular flexible links passing through open-ended holes and fixed with their ends to a rigid frame. A weight-carrying cover is placed on top.



Candock Corporation markets floating docks composed of 48 by 48 by 23 or 36-centimeter cubes of high-density polyethylene resin. Applications range from personal watercraft berthing to industrial floating docks.



The firm's advertisement may garner initial skepticism, but calculation confirms that the 66 cubes illustrated easily support a compact car.

What is perhaps more impressive is the rigidity achieved by the connecting pins. If the total weight were concentrated at one point on the raft, however, it seems possible that the resultant combination of shear and torque could snap the connectors.



The understatedly-named "Floating Platform" is a modular triangular commercial design for a buoyant foundation beneath a lightweight construction. The platform is constructed as an "octet truss" lattice in which 3 layers of tetrahedra polyethylene tanks are shaped with one vertex pointing downwards and a plane facing upwards.



The illustrated construction has sides 8.4 meters in length. Net buoyancy is 2000 kilograms. The maximum load on the sides is 3000 kilograms horizontally and 300 kilograms vertically in a wind of 33 meters/second. To secure the construction under such conditions, the platform should be moored from each corner with a strength of 3.3 tons and an angle of 12 degrees.

Rescue

Japan has floating-island rescue piers in Ise, Tokyo and Osaka Bays



"Emergency Floating islands for New York City," Gianluca Milesi Architecture, Competition and Conceptual Project, 2009,



"Do It Before, Not After" – floating structures operation - A new way to think at disaster The worlds is becoming more and more sensitive to the climate changing, that, according to the most reputed studies, will have heavy and often dramatic effects on the earth and on us. Recently very well known dramatic events pushed the citizens, the governments and the organizations to think new and more appropriate strategies in order to provide relief to the population's victims of these catastrophic natural events.

We propose to built immediately floating structures containing different functions that the city needs even in not emergency times, but that can be easily converted, such as hotels and residential spaces, and reception spaces, events spaces, green and recreational spaces, cultural spaces, sport spaces and cars recovers. The floating structures are the ensemble of these functions: they are floating volumes that can be moved, anchored, connected to the land, connected to themselves, usable before, during and after the emergency.

The floating structures can have different forms and dimensions one to each other, to be more or less dense, to have the chance to be modified and to contain different functions.

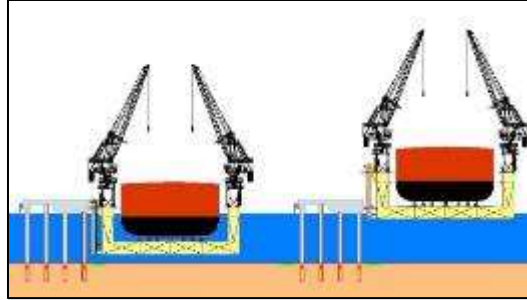
We could illustrate more floating rafts and piers, but the fact is, they are but empty boxes of various sizes, understandable through Archimedes' Law (Chapter 19). Let us move on to docks more dynamic.

Dry Docks

Dry docks are used for the construction, maintenance and repair of watercraft.

One form of dry dock, properly known as graving dock, is a narrow basin which can be closed by gates or by a caisson, into which a vessel may be floated and the water pumped out, leaving the vessel supported on blocks.

Our interest is the floating dry dock, vessel having floodable buoyancy chambers and a "U"-shaped cross-section. When valves are opened that allow the chambers fill with water, the dry dock floats lower in the water, allowing a ship to move into the "U." When the water is pumped out of the chambers, the rising dry dock rises lifts the ship out of the water, allowing work to proceed on the ship's hull.



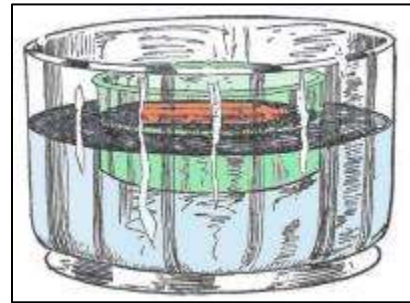
For hands-on instruction, there's Gilbert Hydraulic and Pneumatic Engineer (1920) by Carleton Lynde.

Experiment No. 39. To make and operate a floating dry dock.

Use a flat cake pan to represent the dry dock, and the bottle to represent the ship.

Float the dock on water in a sink or wash basin and pour water into it until it floats with the top about 1 in. above water. This represents the real floating dry dock, with its tanks full, ready to receive the ship.

Float the bottle on the water in the dock. This represents the ship, in the dock and ready to be raised.

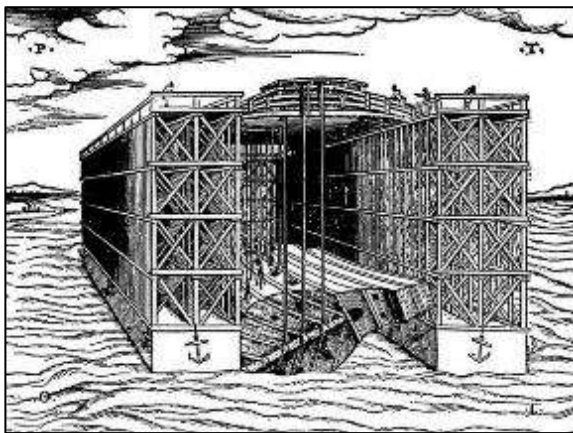


Now siphon the water out of the dry dock and over the edge of the sink or wash basin. This represents the water being pumped out of the tanks of a real dry dock. Do you observe that both the dock and the ship are raised as the water is siphoned out? This shows how the dock and ship are raised when the water is pumped out of the tanks of a real dry dock.

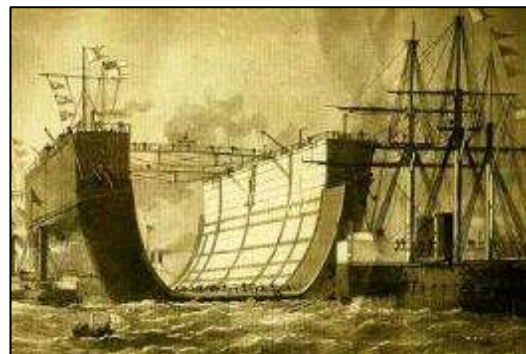
Now siphon water from the sink into the floating dry dock. Do you observe that the dock and the ship sink as water enters the dock?

This represents how the real dock sinks when water is admitted again to the ballast tanks.

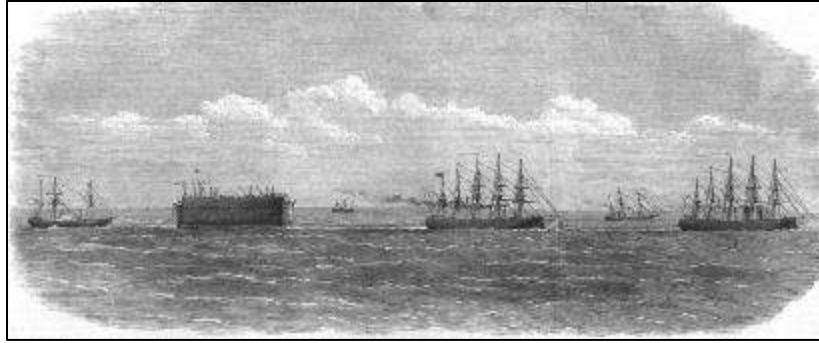
A bit of history,



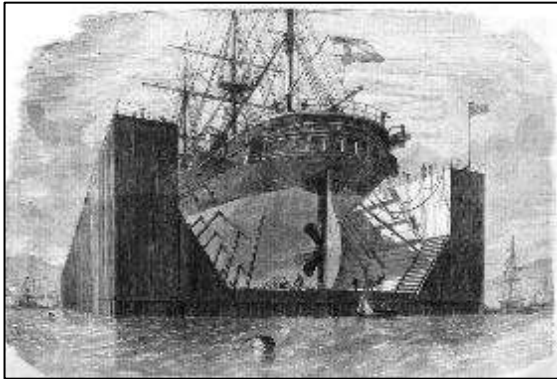
Woodcut Descrittione of Venice (1560)



Floating Dock Bermuda, in service 1869-1906. At 381 by 123 by 74 feet, it was the second largest floating dock in the world.



Floating Dock Bermuda passing down channel, 1869



Spanish Dry Dock, 1862



New York, 1882

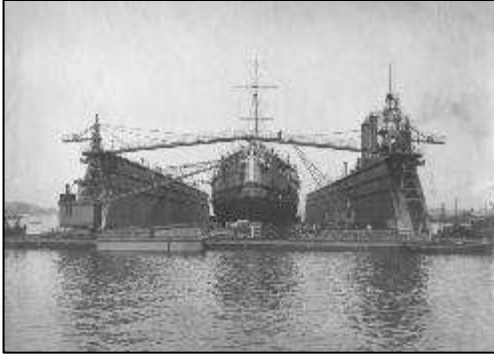


Montreal Floating Dry Dock Duke of Connaugh, 1912, "The Largest Dry Dock that Ever Crossed the Atlantic"



Floating Dock, Kiel Germany, 1920s

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German World War I Helgoland battleship in dry dock, 1921



Singapore, 1941, shortly before Japanese invasion



re
USS Idaho entering Espiritu Santo dry dock, 1944

And the dry docks of today,

Three floating dry docks, Grand Bahama Shipyard,

	1	2	2
Length (m)	310	268.3	300
Between Walls (m)	54.6	33.5	58.5
Draft (m)	8.5	8	9.1
Lifting (tons)	54,000	27,000	82,500





Zhonghai Emeishan, the largest floating dry dock in 2008, 410 by 80 by 30 meters



The world's largest floating dry dock will soon be Royal Dock 5, 432 by 86 meters. Above, Royal Dock 3, as 5 is in construction. 16 pumps can raise or lower the dock by 21 meters in 3 hours.

CHAPTER 73

ANCHOR

The anchoring of floating islands is mentioned in many chapters, e.g., a peat flotations anchored by roots to the lake bed. A half-dozen chapters mention anchors meant to restrain buoyant environmental nuisances or to position artificial islands of one sort or another.

This chapter pursues the topic as an aspect of engineering-design. Should a floating island of whatever sort have propensity to travel, how might it be kept in place?

The Vessel Analogy

Mooring some floating islands can be much the same as mooring boats or ships, the design challenge being that of identifying an equivalent vessel for which adequate anchoring is known. The table below indicates such anchoring.

Vessel (ft)	Protected Areas		Exposed Area		Line
	Mushroom (lbs)	Pyramid (lbs)	Mushroom (lbs)	Block (lbs)	Nylon (in)
Up to 13	50	70	75	200	7/16
14-16	75	135	100	300	7/16
17-20	100	200	150	500	1/2
21-24	200	300	250	1000	5/8
25-27	250	350	350	2000	3/4
28-30	400	500		3000	7/8
31-40		1000		4000	1
41-50		2000		6000	1-1/8

As floating islands are rarely moved, we've not included the nautical anchors designed for frequent retrieval.



A mushroom anchor will normally sink in silt to the point where it displaces its own weight in bottom material, thus increasing its holding power. As such anchors rely upon suction and cohesion of the bottom material, they're poorly suited for rocky or coarse sand bottoms. The holding power of a mushroom anchor is about twice its weight until it becomes buried, at which point holding capacity can be as much as five-fold greater.

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Pyramid and block anchors are generally made of concrete, the pyramid shape being better able to embed itself.

The table indicates recommended anchor line ("road," in nautical jargon) diameter for a sense of magnitude. Chain is more resistant to abrasion.

"Scope" is the ratio of anchor line paid out to water depth. The greater the scope, the greater the anchor's capacity to dig in and resist horizontal displacement. For ships, a scope of 7:1 achieves an anchor's full holding power, but the ratio falls to 3 or 4:1 in some applications.

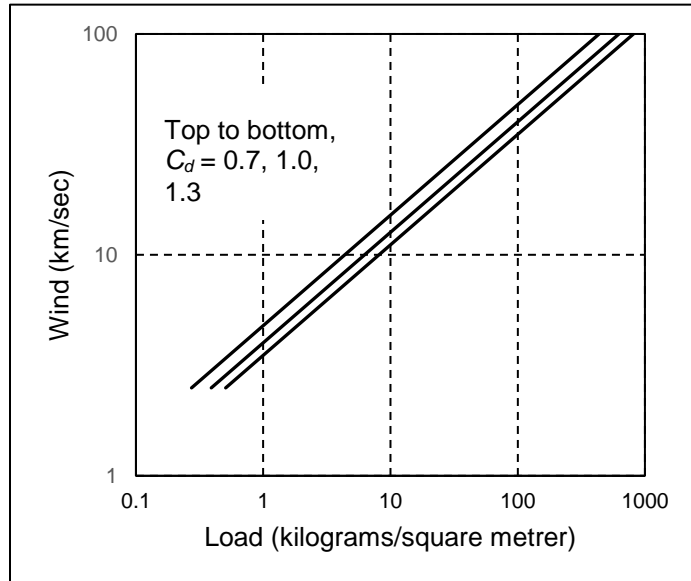
Note the table's upsizing of the required mushroom anchor when the mooring site changes from "protected" to "exposed." While wind, waves and current all contribute to anchor drag, wind tends to be the major force.

$$Load = C_d \frac{\rho v^2}{2} A$$

where,

- Load* = drag force of the wind (kg)
- C_d = drag coefficient, about 1.0
- ρ = density of air, 1.28 kg/cubic meter
- A* = exposed cross-sectional area of object, perpendicular to wind.

To the right, the results graphically



As most floating islands are relatively low, a bare island's *A* is often not large and a few trees can make a great difference.

Our floating islands, in most part, are trivial in size when compared to Seawise Giant, the world's largest tanker in 1979, 81,879 tons empty and 646,642 long tons full. To the right, its 36 ton anchor. The chain is larger than that required to simply withstand breaking, the extra weight sagging any slack to the seabed to pull at the anchor horizontally, bonus scope, so to speak.



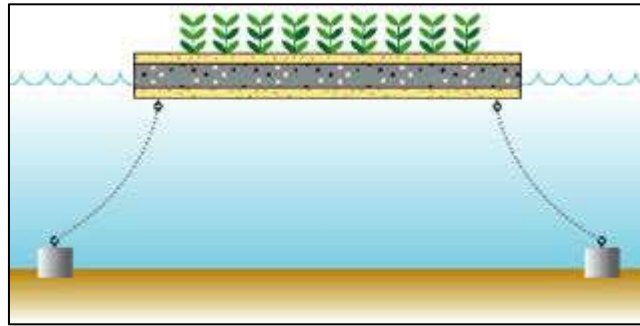
Floating Wetlands

BioHaven recommendations for floating treatment wetlands (Chapter 32):

$$\text{Anchor weight (pounds)} = \frac{\text{Area (square feet)}}{2}$$

Scope = 1.5:1

Anchor at both ends



Manufactured floating wetlands present minimal area to oncoming winds, and thus aren't generally subject to substantial lateral forces. BioHaven's largest standard shape, 403 square feet, requires a 200 pound anchor, 1.4-cubic feet of concrete. A watercraft of the same waterline area would require a block perhaps 10 times greater. For a boat moored with a 7:1 scope, a given anchor would have about 10 times the holding power of that same anchor for a floating wetland at 1:5:1. Thus, vessels -- large scope, light anchor; islands -- islands: small scope, heavy anchor.

Betty's Island

More-substantially constructed than BioHaven products, Betty's Island in Yakima, Washington (Chapter 59), 900 square feet, was original anchored with 500 pounds of concrete, essentially the BioHaven recommendation, with 350 feet of heavy cable.

The island was later re-anchored with a preplaced 2,040 pound concrete block floated into position under a float bag. A 105-foot floating polypro rope rises from the block to a polyform float a few feet beneath the surface where a boat motor cannot reach, and from there, 170 feet of sinking Dacron rope to the island, allowing the island rapid response to the shifting winds.



2,040-pound concrete block and float bag.



Towing into position

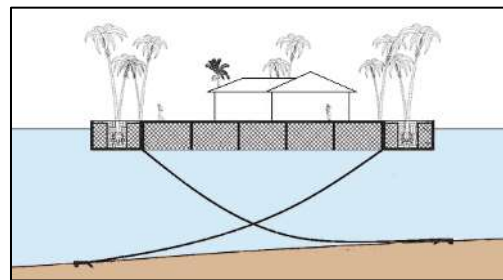


Block is cut loose

Cross Anchoring

Suggested anchoring of a floating island from Functional Design.NL requires dropping a bow anchor, overrunning the location by 2 island lengths, dropping the stern anchor and reversing 1 length.

The design improves the anchoring scope, while keeping the lines largely under the island.



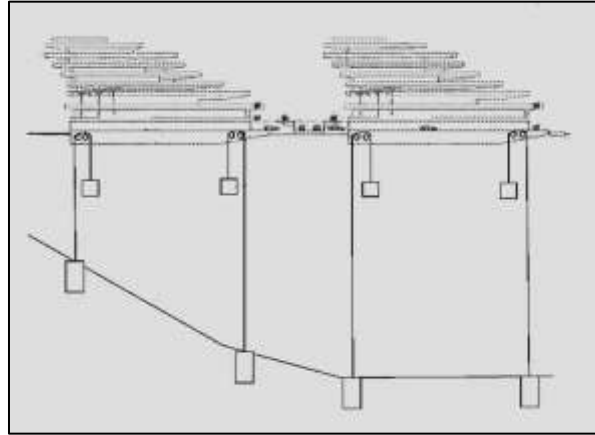
Counterbalancing

"Floating Island Structure and Method for Preventing a Rolling of the Floating Island Structure," US Patent Application WO2014/080085 A1 (2012), by Mikael Hedberg, suggests a counterbalanced anchoring scheme.

A mooring wire is fastened to the sea bed at one end and to a counterweight chamber at the other. The chamber's weight can be adjusted by adding or subtracting water.

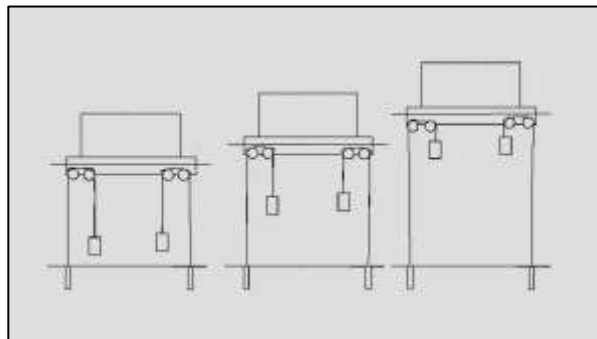
The wire can be fixed to the building module by means of friction breaks or winches, allowing tightening and loosening as required to eliminate rolling of the module.

When two buoyant building modules are interconnected with a non-rigid connecting structure, the rolling of the floating island can be minimized, since the connecting structure allows adjustment of the location of the building modules in relation to each other.

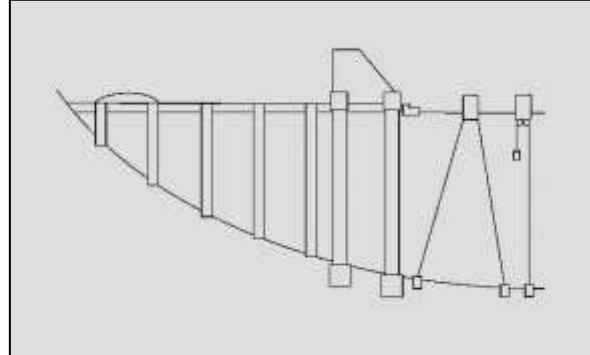


Since the force resulting from the counterweights is at least near constant in all situations, the floating body experiences always the same downward force.

Low tide, Normal tide, High tide



A building module on top of pillars fixed to the sea bed, protected by wave breakers, the outer one being counterweighted.



The weights would have value in returning a displaced floating island to a point directly above the anchor, but how they reduce rolling -- the claimed benefit -- is a mystery.

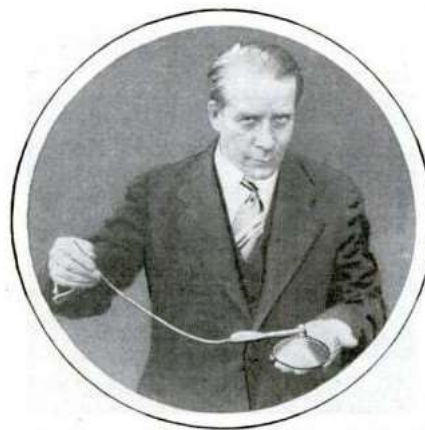
Seadrome

By virtue of relentless publicity, the 1920s' enthusiasm for technological advance, Edward Armstrong's Seadrome (Chapter 57) is perhaps history's greatest floating island story, albeit one that's all introduction. Let us consider the Seadrome's proposed anchoring.

As a 3,000-pound mushroom anchor was used by lightship off Scotland a century earlier, Armstrong's claim of "special" in "Mushroom Anchors to Hold Landing Fields at Sea," Popular Mechanics, August 1928, is somewhat grandiose.

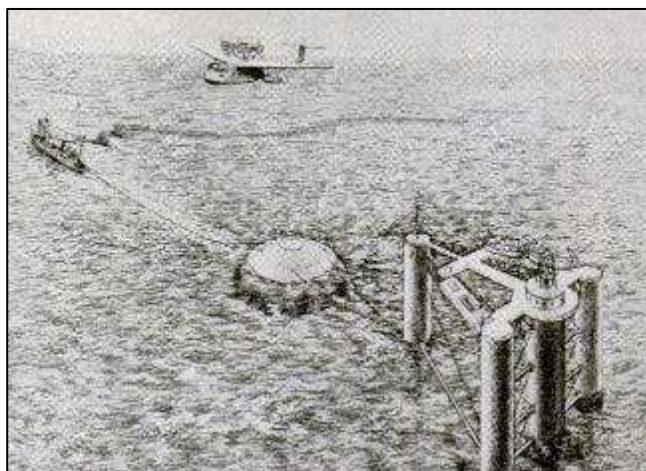
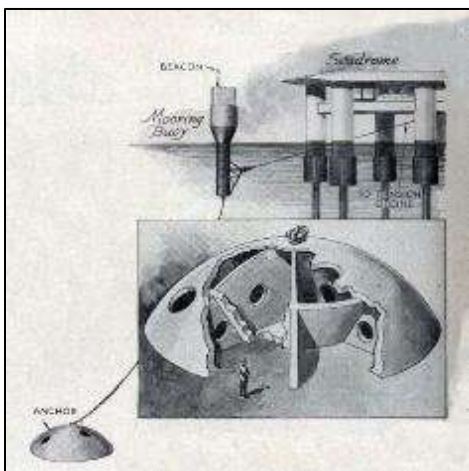
Special anchors have been developed by an eastern inventor to hold the "floating island" landing fields for airplanes. They are of cup or mushroom shape and are intended to grip the bottom of the sea through the partial vacuum which will be formed within the bell-like portion of the anchor. A number of these, it is believed, fixed to a rock bottom, would keep the landing field or seadrome from being torn away from its moorings.

Model of Mushroom Anchor intended to Hold Floating Island Airplane Ports to the Bottom of the Sea



We recognize the "inventor," Armstrong. Use on a rocky sea floor contradicts the anchor's design for a mud strata, but Armstrong was rarely encumbered by practicality,

A single anchor would allow the runway to align with the wind.



1,500-ton concrete mushroom anchor

Towing anchor and buoy to sea

As a cable connected directly to the Seadrome would be excessively strained, the anchor was to be connected to a buoy by twin 18,000-foot suspension bridge cables. The Seadrome would be tethered by another 1,000 feet cable on a "tension engine" to respond to sudden strain.

"Airports at Sea," Flying, August 1943, notes some of the challenges.

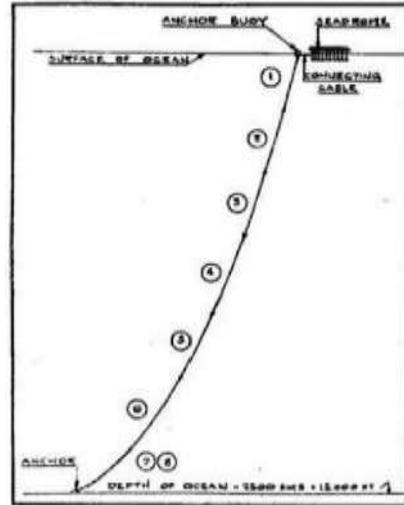
It would be impossible, of course, to moor a ship of 100,000 tons in mid-Atlantic -- it would either break itself or its moorings. This is not true of a Seadrome structure, which is not subject to wave action as is a surface hull. The Seadrome's strain on its moorings will be but the combined net of wind and current. The greatest storm winds ever authentically recorded in the North Atlantic seldom exceed 70 m.p.h. and the greatest current on the route selected for the installation of the seadromes is only one and a half knots. The combined stress under a combination of these maxima would result in a pull of about 300,000 pounds on the Seadrome's anchorage system.

Armstrong, as we know from Chapter 76, was enamored with news-making models, but in this case, a properly-designed laboratory model would have been in order.

The anchor will be mushroom-shaped, about 95 feet in diameter, and weighing about 1,500 tons. It will be capable of flotation, carrying the cables coiled within.

The anchor thus lowered can never be recovered. With its buoyancy chambers filled with water, it will settle into the ooze and its flat bottom cling immovably to the ocean's clay floor. The whole gear is capable of withstanding a pull of over 600,000 pounds, more than twice that calculated as ever being exerted by the seadrome under the most extreme conditions of storm. When desirable, the propulsion units can be used to supplement the anchor system.

The anchorage cables will not be directly connected with the seadrome itself, but with a seadrome-type of floating mooring which will ride almost vertically over the anchor, permitting the seadrome in its cable bridle to ride downwind from it.



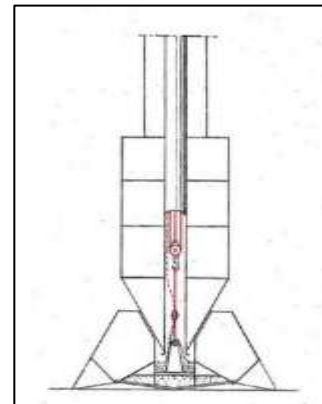
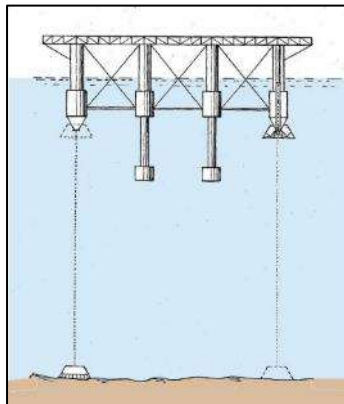
Not for a 1943 Popular Mechanics to reveal, as a copy might fall into Axis hands, was that Armstrong was already onto something bolder, having the year before filed US Patent 2399611A for a submersible Seadrome "designed for use at sea as a servicing and refueling base for aircraft in wartime."

This object is accomplished, broadly, by the provision of a seadrome structure having very considerably residual buoyancy which is anchored to the sea bottom through the medium of "haul down" mechanism.

We've moved from the impractical to the bizarre.

The structure would be vertically cabled to anchors fixed in the sea floor. When Nazi bombers were in the region, the floating airfield could be dropped below the waves by flooding the ballast chamber and ratcheting down the cable.

On the right, the pulley and cable in red.



The tackle extends down through the opening and is adapted to be connected to the anchorage cable support buoys. Anchorage is secured by means of weight type anchors of the type customarily employed for seadrome anchorage.

"Customarily employed," somewhat of an overstatement, as none had ever been constructed.

The haul down mechanism is essentially similar to that used to support the drill stem in the drilling of oil wells, and is designed to exert a down-haul of over 175 tons, and to maintain a uniform tension on the winch lines during emergence.

Armstrong or once understates his originality. Another 40 years would pass before the petroleum industry implemented haul-down technology in the tension leg platforms described later in this chapter. Industrial historians credit Armstrong's ill-conceived Seadrome as the design's origin.

Rigs

By virtue of their oceanic locations, floating petroleum rigs (Chapter 71) can require mammoth anchoring schemes.

As dead weight anchors have low holding capacity per unit weight of anchor, they're not used in deep sea drilling, but we'll note the option as illustrated in "Floating Support for Drilling Devices," U.S. Patent 496 729, by A. Fairchild, 1893.

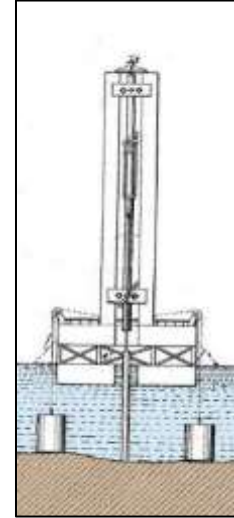
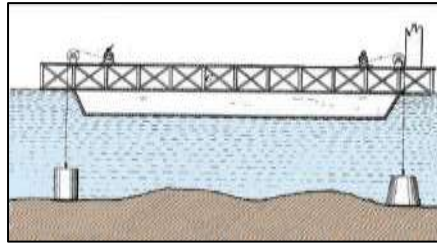
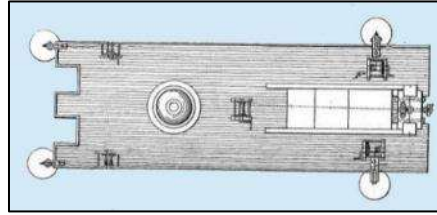


Plate anchors are rectangular plates embedded in silt, sand and clay seabeds. The plates, typically 15 to 30



square meters, and embedded 20 to 40 meters below the bed.

Plates are generally placed by a submerged pile driver, but jetting can also be used to penetrate dense sand. Well embedded plate anchors can have holding capacities exceeding 500 tons.

Suction anchors are open-bottomed caissons capable of penetrating into the seabed far enough to seal. A submersible pump then evacuates the water and mobilized sediment from within, and the pressure differential causes the caisson to further suck itself downward.



Suction anchors ready to be deployed.

Concrete or steel piles, typically in the 2-meter diameter range and as much as several hundred feet long, can sometimes be



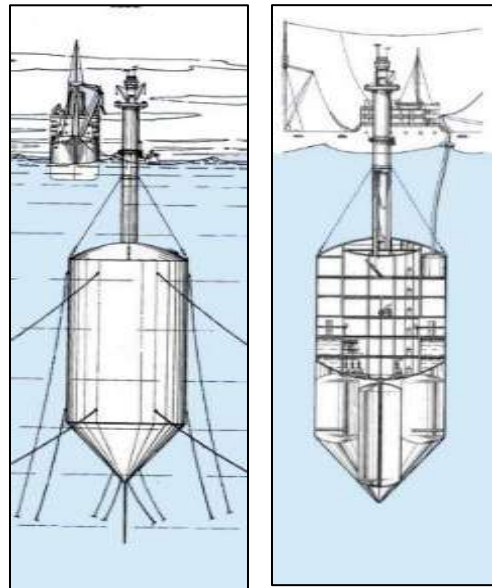
driven into the seabed by a submersible hydraulic hammer. The tether attaches to the crown of the pile.

Submersible pile driver

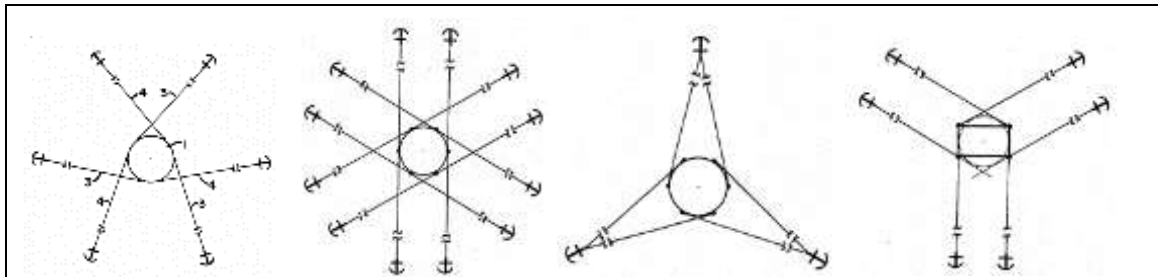
As for how the cabling of rigs, we'll begin with a torqued approach by no less than Buckminster Fuller, "Undersea Island," US Patent 3,080,583A (1959).

An offshore oil well rig according to my invention comprises in essence an undersea island having an anchoring system which effectively restrains it against motion other than a moderate movement up or down as the tide comes in and runs out.

My invention in its general arrangement comprises an undersea island including a buoyant caisson submerged under the pull of anchor rodes extending from the sides of the caisson to anchors distributed around it, several of the rodes extending tangentially clockwise and several tangentially counterclockwise, the former constituting a group of rodes tending to produce clockwise rotation of the caisson about a vertical axis and the latter constituting a group of rodes tending to produce counterclockwise rotation. The one group of rodes creates a torque which is equal and opposite to that created by the other.

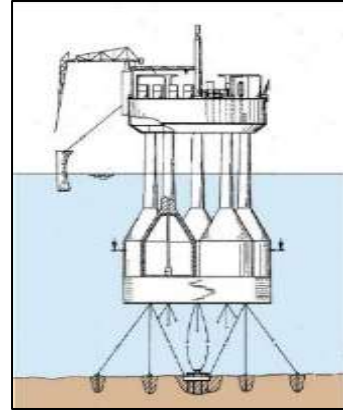


Fuller's claim includes the anchoring examples below.



Any engineering student could readily compute the tensions -- the laws of force are not patentable -- and conclude which is the better, but as we note in Chapters 70 and 76, Fuller's forte was ideas, not numbers.

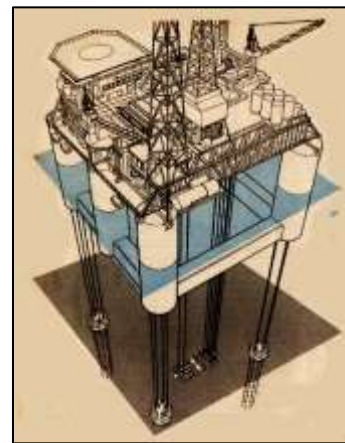
"Floating Island for Extracting or Processing Gas" US Patent 4,168,679 (1979), by Fritz Poeppel, illustrates another scheme, again, one that's not particularly efficient.



To reduce heave in deep seas, the tension leg system pretensions vertical moorings ("tendons"). There are generally four anchor foundations, each with flexible joints to which tendons are attached.

Once the tendons are placed, a ballasted rig (or portion thereof) can be mechanically jacked down, say, 2 meters, pre-tensioning the tendon to, say, 1,000 tons. Deballasting increases the stress to perhaps 1,600 tons, and the tether is locked off.

Subjected to horizontal displacement, vertical tendons experience significant additional stress, and for this reason must be stronger than cable plied out at a scope. For this reason, the "cable" may in fact be thick-walled steel pipe.



The Mars Platform in the Gulf of Mexico (Chapter 71) employs 12 such pipe tendons, three per corner, each 28 inches in diameter with 1.2 inch wall thickness and 2,850 feet in length. Each tendon connects to an 84-inch pile, 375 feet long and weighing 260 tons embedded in the seafloor. If the Mars tendon steel were a single strand, its diameter would exceed 40 inches.

Floating Bridges

While Washington's Evergreen Point Bridge (Chapter 56) is one of the world's largest such structures, its mooring is fairly conventional. In its original construction, 62 reinforced-concrete anchor blocks, 77 tons apiece, were sunk into the channel bed and 2-3/16 to 2-3/4-inch cables extended to the structure. Reconstruction will reduce the number of anchors by 4, but increase the cable size to 3 inches. Whereas the recommended scope for moored ships is 7, the bridge anchoring is half of that.

Floating Wind Turbines

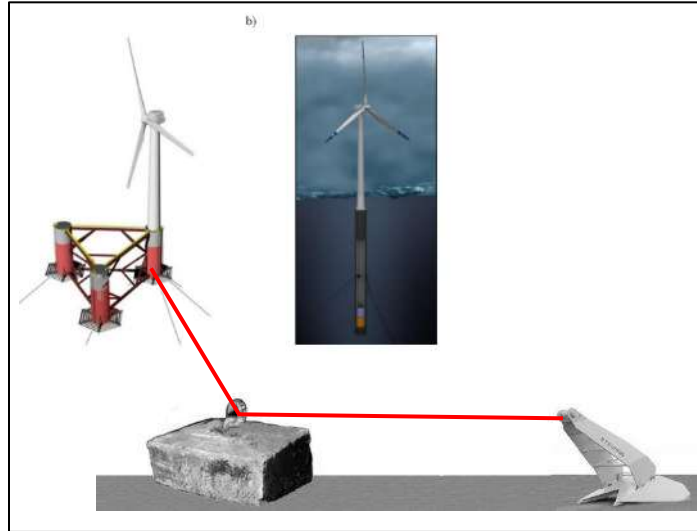
While a floating island could have a farm of wind turbines (Chapter 71), we'd perhaps not consider a solitary floating turbine to be an island. None the less, we note the Sandia National Laboratories' "Deep-Water Floating Offshore Vertical Axis Wind Turbines," 2014-16800, for its attention to anchoring. The project compares a hypothetical spar-mounted turbine to one seated on three tension-legs off the Northeastern coast for the following event:

Water Depth 206 meters
 Wave Height 24.24 meters
 Period 12.97 seconds
 Wind Speed 50 meters/second
 Ocean Current 0.88 meters/second

The cable attaches to a delta connection near the spar's midpoint. For the tension-leg platform, one line attaches to each caisson. A mooring cable runs to an un-embedded clumped weight on the seabed, and from there, along the bottom to a Stevpris Mk6-style drag embedment anchor.

To the right, a schematic of a tension leg platform, a spar platform, the clumped weight and a Stevpris Mk6.

(As a turbine is orders of magnitude smaller than an oil rig, such a mooring scheme would never be used on the latter.)



Computed results

	Spar	Tension-leg
Wind Load (kN)	3,140	3,140
Total Load (kN)	6,550	9,720
Max Horizontal Load (kN)	8,120 - 8,350	12,270 - 12,390
Block Mass (kg)	21,000	31,000
Cubical Side (m)	2.06	2.34
Holding Capacity (kN)	8,480	12,450

As the lateral load on the tension legs is substantially greater than that on a single circular spar, more anchoring is required.

Conclusion

Regarding the anchoring of floating islands, we've but briefly surveyed some of the engineering challenges and technologic possibilities. Clearly, a great deal of effort has been applied the task. Should we blithely relegate the anchoring of a floating island to the trivial-tasks department, we risk seeing it float away.

CHAPTER 74

SLUMBER

We need our shut-eye, of course, but whether or not to attempt it on a floating island remains an open question.

Daniel Webster and the Mystery of the Floating Island

"Webster's Floating Island," New York Press, July 26, 1896, a Massachusetts legend regarding the Agawam River below Glen Charley Dam,

Webster and Tindale went out early one spring morning to have a try at the white perch, which from time before the memory of man have abounded in the waters of the Agawam. Tindale returned to his sail factory before after a while, leaving Webster to fish alone. The latter fished from the shore until he became drowsy and finally fell asleep. When he awoke, late in the day, he soon found, to his consternation that he was on an island. What trick had been played upon him, by man or by nature, he could not fathom. Certain he was that when he fell asleep he was fishing from the low bank of the stream without having crossed water to reach it. Now a broad expanse of water on either side, with the stream above and below, made an island of the rather small tract of terra firma upon which he stood. It was growing dark, and there was no boat and no means of getting to the mainland in sight. Becoming alarmed of the prospect that soon it would be inevitable for him, he set up a loud hallowing for help.

Sam! Hullo! Hullo, there, somebody! Hullo, Sam, help! I'm afloat in the river on a strip of land!

He had noticed that the water expanse was widening between the island and the mainland, and it did seem that a place of the river bank had become detached in some way and was slowly floating off further into the stream. Webster's cries were heard by a man on the mainland, who procured a boat and rowed him ashore.

Ever after it was told of as the day Daniel Webster got lost on the river and the mystery of the floating island, and fishermen were warned never to permit themselves to fall asleep when fishing from the riverbank below Glen Charley, for they might wake up and find themselves afloat.

A Poor Night's Rest

From Robert Ballantyne's Martin Rattler, or A Boy's Adventures in the Forests of Brazil (1859),

A mass of floating logs which had caught firmly in a thicket, and were so covered with grass and broken twigs as to have very much the appearance of a real island.

Here they landed, so to speak, kindled a small fire, made some coffee, roasted a few fish, baked several cakes, and were soon as happy and comfortable as hungry and wearied men usually are when they obtain rest and food.

"This is what I call jolly," remarked Barney.

"What's jolly?" inquired Martin."

"Why this, to be sure, -- grub to begin with, and a smoke and a convenient snooze in prospect."



The hopes which Barney cherished, however, were destined to be blighted, at least in part. To the victuals he did ample justice; the pipe was delightful, and in good working order, but when they lay down to repose, they were attacked by swarms of stinging ants, which the heat of the fire had driven out of the old logs. These and mosquitoes effectually banished sleep from their eyelids, and caused them to reflect very seriously, and to state to each other more than once very impressively, that, with all their beauties and wonders, tropical lands had their disadvantages.

In "The Malinga," Salem Daily News (Ohio), March 17, 1890, the author spends a likewise frustrated night 750 miles up the Congo.

A thick, floating mass of interlacing sedge grass clinging to the bank prevented us reaching the shore. Accordingly, fastening our canoes to this, we stepped out on to the grass, which bore our weight, although it rose and fell beneath each movement. We promptly stretched ourselves out on this grassy couch, and although a leg would sometimes break through and reach the river flowing beneath we managed to keep afloat and get some sort of rest in spite of mosquitoes and a drizzling shower of rain. I had an India rubber ground sheet with me, useful for stretching on the floor of one's tent or sleeping on at a pinch, and this I now endeavored to rig into a shelter from rain and mosquitoes by throwing it over my head and huddling my knees up to my chin, while I could feel myself slowly making a deeper impression in the grass raft and gradually settling down in the sedge until I expected every moment to go through altogether and take a plunge in the river.

Charles Brent, "A Strenuous Vacation," Outlook, June 3, 1905, remarks on the suitability of the floating islands of the Liguasan Marsh, Mindanao as a bed.

Night descended on us with that haste which in the tropics neglects to observe the ritual of twilight, and found us still far from solid land in spite of steady paddling. So we grouped our flotilla together in neighborly fashion and prepared to bivouac. We were in the heart of a lotus swamp. On every side the stately pink flowers stood sentinel above their capacious pads. We did not take it hardly that we would have to go supperless -- I was going to say "to bed," but, on the whole, I think "to roost" would describe the situation more graphically.



Elbow-room does not go begging in a vinta, and various boxes at different angles nudged different parts of my body every time I tried to gain sufficient equilibrium to court sleep. But sleep laughs down physical discomfort where any one is concerned short of Hans Andersen's princess who is tortured by a malicious pea several feet of eiderdown beneath her.

From Ernest Shackleton's South: The Story of Shackleton's Last Expedition 1914-1917 (1919), which unfortunately wasn't his last expedition,

At midnight I was pacing the ice, listening to the grinding floe and to the groans and crashes that told of the death-agony of the Endurance, when I noticed suddenly a crack running across our floe right through the camp... Nothing more could be done at that moment, and the men turned in again, but there was little sleep. Each time I came to the end of my beat on the floe I could just see in the darkness the uprearing piles of pressure-ice, which toppled over and narrowed still further the little FLOATING ISLAND we occupied.

Robert Wiese notes another problem with sleeping in the vicinity of the floating island in Dungeons & Dragons (Chapter 11).

If the PCs spend the night on the mainland within sight of the island, a couple hours after midnight, when the island is closest to the camp, four half-dragon deinonychuses swim from the island looking for food.

A Good Night's Rest

A good night's sleep is promised, of course, at floating residences and hotels, Chapter 70 being a starting point for vacation planning. Below are some photos of the accommodations

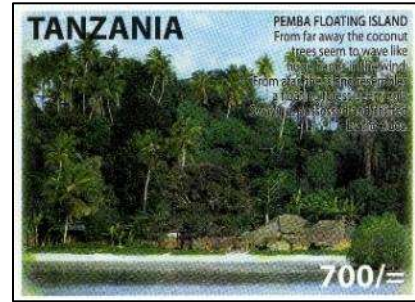


Floating hotel, Pemba Island, Zanzibar, Tanzania

Chapter 74 -- Slumber

It's written on a 2011 Tanzanian postage stamp, in fact, that Pemba Island itself is floating, but with a disclaimer.

Pemba Floating Island. From far away the coconut trees seem to wave like huge hands in the wind. From afar the island resembles a floating forest seemingly swaying, possessed and shifted by the trees.



Lodging with the Uros of Lake Titicaca, Peru (Chapter 36)



A Night's Travel

A less-than-original literary device in chronicles regarding floating islands is the character who falls asleep in one location, and awakens to find himself in another

Lake Henry, Idaho, "An Idaho Floating Island," Current Literature, May, 1889 (Chapter 37),

You pitch your tent some evening on one side near the island and are pleased with the beautiful prospect. There is the island only a few rods from you, covered with trees and grass. The next morning you wake up and the island is gone. You look far away to the other side and there it is, its trees bending gracefully in the wind. Along in the afternoon it returns, or it may take an easy jaunt off at an oblique angle from you.

Lake Chad, The Drifting Island, or The Slave-Hunters of the Congo (1898), by Walter Wentworth (Chapter 12),

Sometime during the night, soon after midnight -- as near as they could afterward judge -- the great cables that held the island to the mainland parted. They were weaker than they looked,

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Chapter 74 -- Slumber

after their long exposure to the weather, and stationary as the island seemed, it was yet tugging with tremendous force at its bonds, as the wind swept through the branches of its trees.

The rotten cables gave way. As they did so, the island seemed to feel the relief, and a tremor ran through it which was unfelt by the tired lads, but was felt by watchful Jack. He, quick, intelligent fellow, perceived the situation, and felt -- with that mysterious insight which an intelligent animal sometimes shows -- that something was wrong.

The next morning both the boys were awakened by Jack. This time the dog would not be quieted. He had gone roaming about the little island before his young masters were up, and had seen nothing on all sides of the island except water. Bob and Ted arose leisurely; the wind seemed to have abated, which was merely because the island was now yielding to its pressure, and was "running before" it.

Onota Lake, Massachusetts, "Floating Island Sold," Fort Wayne News, April 6, 1903 (Chapter 68),

For a time the island would be next to a certain shore and the abutting owner would lay claim, only to awake some morning and find that it had migrated toward his neighbor's property.

Islands and Their Mysteries (1920) by A. Hyatt Verrill,

On one occasion, I made camp in the Guiana forest, stretching our shelter and slinging our hammocks between immense trees upon a little knoll, and when we awoke the next morning found our camp upon a wooded island several miles below the spot where we had gone to sleep and with a mile or more of water between us and the forest.

A tale regarding San Pedro, Chile, "The Weather Vane," Buffalo Evening News, June 4, 1924 (Chapter 50),

It was not until after the next morning that I awoke and came forth from my tent for my morning bath. Instinctively I looked toward where San Padre had been the night before. It was not there. There was no land in sight! The island was in the middle of a trackless ocean!

"The Floating Island," The Amazing Amazon (1949) by Willard Price,

A lone Indian who wanted to travel night and day. but must get some sleep would tie his canoe to a floating island and wake up in the morning to find himself some thirty miles further downstream.

Conclusion

Sleep on solid land.

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CHAPTER 75 ENTER UTOPIA

We remarked in Chapter 7 that beyond the portal out of the Mediterranean once lay Atlantis, a utopian continent now below the sea. In this chapter we'll begin with that story, carry it forward to even less-likely hypotheses of the island's flotation and end with a broader look at other floating utopian islands.

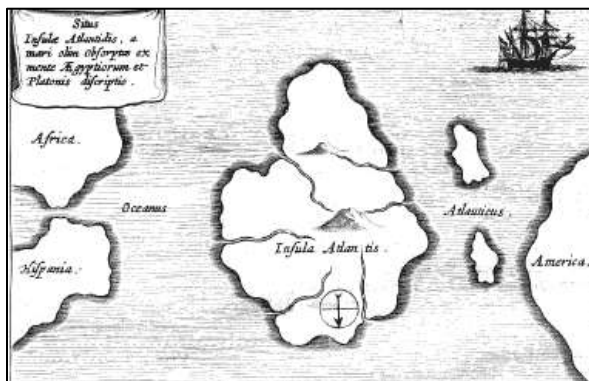
Atlantis

Suggested in older Egyptian legend, the island of Atlantis was first described in Plato's Timaeus (c. 360 BC).

In those days the Atlantic was navigable; and there was an island situated in front of the straits which are by you called the Pillars of Heracles; the island was larger than Libya and Asia put together

Now in this island of Atlantis there was a great and wonderful empire which had rule over the whole island and several others, and over parts of the continent, and, furthermore, the men of Atlantis had subjected the parts of Libya within the columns of Heracles as far as Egypt, and of Europe as far as Tyrrhenia.

But afterwards there occurred violent earthquakes and floods; and in a single day and night of misfortune all your warlike men in a body sank into the earth, and the island of Atlantis in like manner disappeared in the depths of the sea. For which reason the sea in those parts is impassable and impenetrable, because there is a shoal of mud in the way; and this was caused by the subsidence of the island.



Athanasius Kircher. 1665



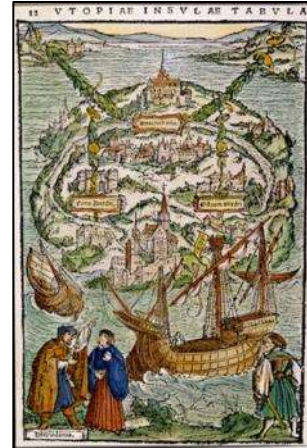
New York American, October 20, 1912

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Chapter 75 -- Enter Utopia

For his Utopia (1516), Thomas More coins the name "utopia" from the Greek ou-topos (no place or nowhere) and eu-topos (a good place).

It's of little surprise that utopian novels are often set on islands without territorial or national claims, and most importantly, the constraints of civilization. To enhance a work's literary tension, however, it's not uncommon for the reader to view the island through the eyes of a "discoverer."



More's eyes are those of a recently-returned traveler.

The island of Utopia is in the middle two hundred miles broad, and holds almost at the same breadth over a great part of it, but it grows narrower towards both ends. Its figure is not unlike a crescent. Between its horns the sea comes in eleven miles broad, and spreads itself into a great bay, which is environed with land to the compass of about five hundred miles, and is well secured from winds.

This was no island at first, but a part of the continent. Utopus, that conquered it (whose name it still carries, for Abraxa was its first name), brought the rude and uncivilised inhabitants into such a good government, and to that measure of politeness, that they now far excel all the rest of mankind. Having soon subdued them, he designed to separate them from the continent, and to bring the sea quite round them. To accomplish this he ordered a deep channel to be dug, fifteen miles long.

Other than how a 15-mile excavation could isolate a landform of this size from the rest of the world, the island is the effort of ditch-digging. It's floating nowhere.

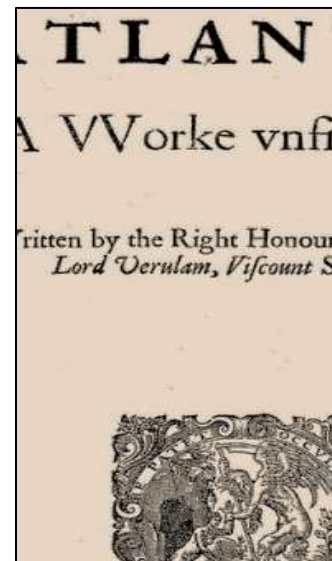
Francis Bacon's New Atlantis (1627) depicts discovery of the mythical isle of Bensalem by a wayward English ship west of Peru.

Bacon's Original Atlantis

[The island was] 5,000 miles in circuit, and of rare fertility of soil, in the greatest part thereof; and finding also the shipping of this country might be plentifully set on work, both by fishing and by transportations from port to port, and likewise by sailing unto some small islands that are not far from us

This land was known and frequented by the ships and vessels of all the nations before named. And (as it cometh to pass) they had many times men of other countries, that were no sailors, that came with them; as Persians, Chaldeans, Arabians; so as almost all nations of might and fame resorted hither.

At the same time, and an age after, or more, the inhabitants of the great Atlantis did flourish.



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Bacon's Atlantis Destroyed

The great Atlantis was utterly lost and destroyed: not by a great earthquake, as your man sayeth; but by a particular deluge or inundation; those countries having, at this day, far greater rivers and far higher mountains to pour down waters, than any part of the old world.

For as for men, although they had buildings in many places, higher than the depth of the water, yet that inundation, though it were shallow, had a long continuance; whereby they of the vale that were not drowned, perished for want of food and other things necessary, this land was to maintain itself without any aid (at all) of the foreigner; being five thousand six hundred miles in circuit.

Bacon's New Atlantis

When the king had forbidden to all his people navigation into any part that was not under his crown, he made nevertheless this ordinance; that every twelve years there should be set forth, out of this kingdom two ships, appointed to several voyages... only to give us knowledge of the affairs and state of those countries to which they were designed, and especially of the sciences, arts, manufactures, and inventions of all the world; and withal to bring unto us books, instruments, and patterns in every kind.

As explained by Gerald Massey. in Ancient Egypt: The Light of the World (1907),

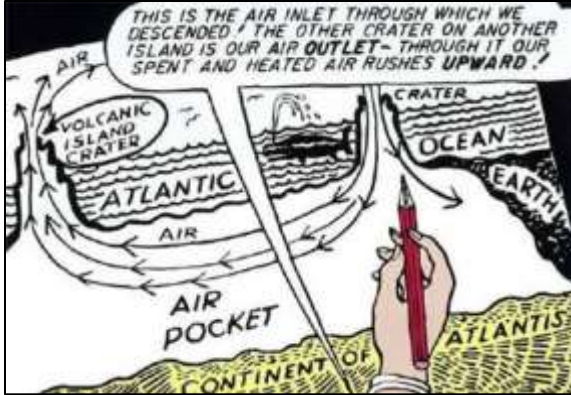
The islands of Atlantis, whether seven or ten in number, would not have become the sunken islands unless they had been floating isles at first; and they were floating as formations in the water of heaven. The earliest foothold in the infinite had been physically attained amongst the stars that do not set. This was a place of refuge and of safety from the deluge of the firmamental deep whenever the catastrophe occurred.

In "Unfinished Creation," Agora. January 1893, Mary Lease pursues an environmental explanation understandable to those familiar (as were even the ancients, Chapter 1) with the Sargasso Sea.

Nine thousand years before Plato lived and wrote there existed, he tells us, in the ocean that separates the Old World from the New, an island larger than Asia Minor and Northern Africa combined. He locates it in what is now a watery waste, midway between the western projection of the desert coast of Africa and the corresponding indentation by the Gulf of Mexico.

For many centuries the Sargasso Sea, that vast expanse of floating weed, has occupied the locality where the great island, with its busy marts and teeming thousands, sank from sight. To this cause the ancients attributed the existence of this meadow sea.

Irish myth is rife with allusions to an Atlantis-like utopia in the Western Sea. Chapter 80 relates such stories.



Wonder Woman 8, Spring, 1944.



The Secret of Atlantis," Donald Duck Adventures 17, October 1, 1991

Though the Atlantis has varied in the retellings, one aspect seems to be agreed upon: the lost island is stuck on the seabed. But as we know, it's hard to keep a good island down. From here, however, the portrayal becomes less utopian and more mobile.

To the right, "Tales of Atlantis, Sub-Mariner #62, March 1973, in which we see it broken free of the ocean floor and bobbing to the surface.

From *Shattered* (2014), one of the "Forever Camelot" series by J. Lynn McCoy,

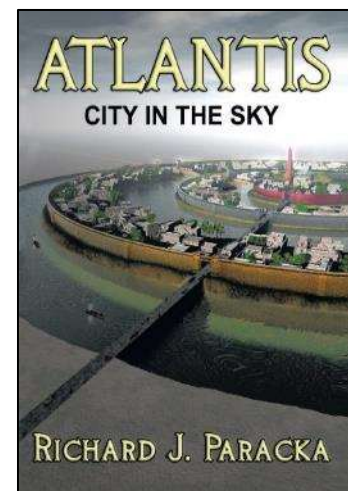
Atlantis lay in crumbling ruins on a chunk of earth, floating, drifting precariously on the turbulent sea. Poseidon asked the king once again to admit he was not above the Gods. Admit his mistakes and give him the princess.

Yes. Believe it or not, we will find passage to Atlantis just off the western coast of Cornwall. We can teleport to Tintagel and ride along the coast to Pendour Cove.



While *Atlantis, City in the Sky* (2010), by Richard Paracka, is about two boys who discover an Inca treasure buried near Bolivia's Lake Poopo, an extension of the recent legend that the remains of Atlantis can be seen in NASA satellite photography.

We're not that smitten with the boys' race against criminals, archaeologists and a pharmaceutical magnate sleuth. Our attention is drawn toward the "City in the Sky," the 6,000-meter Altiplano, in the setting's sense, but at the same time, a subliminal evocation of a soaring metropolis.

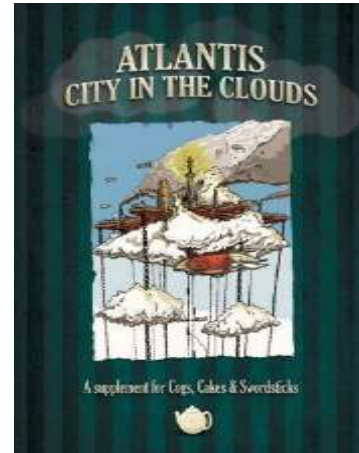
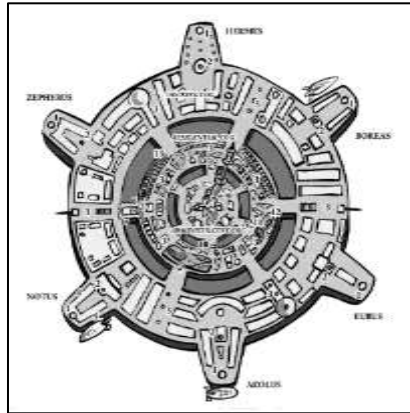


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Not quite the same name, Atlantis, City in the Clouds is the sourcebook providing in-depth description this flying city for the game "Cogs, Cakes & Swordsticks"

A marvel of the modern age, Her Majesty's Flying Steam City Atlantis (known to her inhabitants simply as 'The Cog') hovers above the Atlantic Ocean like a proud, floating galleon.



A bit more from "Cogs in the Sky," Wibbley-Wobbley Timey-Wimey Pookie Reviewery, April 4, 2014,

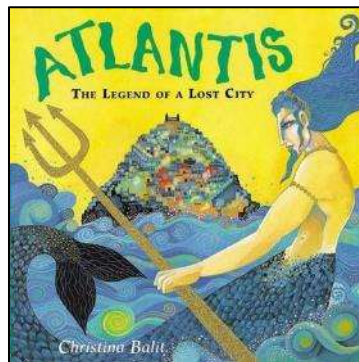
Her Majesty's Flying Steam City Atlantis consists of an upper and a lower ring. The latter is home to the six Directional Steam Assemblages, the mighty, ever thrusting engines that keep the city, itself known as "The Cog," aloft. Each is fed a steady supply of coal -- dug from the mines that run from underneath sea surrounding Monturiol below -- around the clock.

Atlantis is depicted in the 2004-2009 TV series Stargate: Atlantis as floating upon an ocean, though it can rest on the seabed or fly through space, depending on the needs of the script. As fantasy-fiction fans tend to speculate about the science, the on-line community regularly wonders, "Why does it float?" Discussion provides no sensible answer.



Christina Balit's Atlantis: The Legend of the Lost City (2000) is of a floating island

Floating on one of Poseidon's emerald seas was a small rocky island. Few visited its shores and no one bothered to give it a name. But the sun rose warmly over it each morning and set sleepily behind it every night.



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King Poseidon makes the land rich and fertile, but his descendants act less like gods and more like men. We know the outcome.

A popular computer screen wallpaper purported to be about Atlantis



Where fantasy leads -- that with marketable potential, that is -- investment follows. To the right, the Bahamas resort Atlantis - Paradise Island,



Other Floating Utopias

There's no reason that such a utopian island must float, other than its drift may explain its elusiveness. Irish folklore accomplished the same by shrouding the landform in mist (Chapter 80). In lesser need of scientific plausibility, Pacific islanders hid theirs by magic (Chapter 4).

But floating's always been a favorite, a la Jonathan Swift's Gulliver's Travels (1726) in Chapter 81 and Jules Verne's Propeller Island (1895) in Chapter 12. Here are three more.

L'le des Hermaphrodites (1605), by Thomas Artus, tells of a traveler, weary of the civil strife rending the kingdom of France, who leaves for America. Disappointed, he decides to return, but his vessel comes upon a floating island, and the traveler examines its inhabitants and customs, a condemnation of both the decadence of the Old World and the savagery of the New.

A Frenchman who had fled the troubles of his fatherland, on his return journey was stranded after a shipwreck on a floating island with a fellow-traveler and the ship's pilot. The narrator and his companion subsequently enter into the palace where they witness the elaborate courtly ceremonies of the lever and the foppish manners of the courtiers and their ruler. The narrative gives way to satirical extracts from the laws and regulations by which the island is governed.



Chapter 75 -- Enter Utopia

In a similar setup, Gabriel-Etienne Morelly's Naufrage des isles flottantes, ou Basiliade du celebre Pilpai (1753) is an allegory infused with Enlightenment fascination with the Orient and the New World. Human corruption has forced Nature to fracture the continent into floating islands.

A ship is wrecked upon a floating island inhabited a golden-age, pastoral society founded upon and governed by love. Morelly attacks law and property, in favor of a society governed by the laws of nature and truth



In Polydorus (1794), by Mikhail Kheraskov, the titular character, namesake of the eldest son of Cadmus and Harmonia, and king of Thebes, visits a dystopian surrogate of post-revolutionary France, the "floating island" of Terzit Its name recalls both "terzat" (to tear to pieces) and "Tersit" (the Russian name of Thersites, the agitator who goads Odysseus in the Iliad).

Once a utopian kingdom under King Iland, the island is torn by violence perpetrated by youthful revolutionaries in the name of "liberty." The people "were everywhere like a flock wandering without a shepherd." Polydorus restores order, stating that "equality is a monster that gives birth to itself and in unbound fury tears itself to pieces"

Again, we needn't end with fiction. Chapter 53 describes another "New Atlantis," albeit one just 8 by 30 feet, briefly established as a tax utopia, so to speak, in the Caribbean by Leicester Hemingway, brother to Ernest.

Conclusion

As utopias can only remain as such by evading external authority -- and even then they generally can't, but that's not our point -- it makes great sense to establish them on islands that can move evasively. We're not the first to have that idea.

CHAPTER 76

MODEL IT

A "model," in its encompassing sense, is an expression of one thing in terms of another. Equations work to model the physical buoyancy of an island floating on water. Biological models describe an island's ecology. Visual models are stock-in-trade for promoters. Flanders' floating fishing island (Chapter 65) made its way across America as a newspaper sketch far more expeditiously than it made its way across a waterbody.

In this chapter, we pursue a very specific subset of modeling, the observing of scaled physical representations to predict full-scale behavior.

"Scaled" distinguishes our focus from full-size prototypes built for testing in a "real world" environment. Chapter 57, for example, discusses British and American World War II-era pursuit of floating airports, Lilly and SOCK, respectively, in which an experimental was tested with actual airplanes.

Guiding a toy airplane onto a same-scaled floating island probably won't tell us much about the suitability of the full-scale runway. Subjecting the island to a laboratory wave tank, however, can reveal a great deal about the full-scale stability in heavy seas.

In the examples to follow, a miniaturized version of the floating object was -- or in some cases was inferred to have been -- floated to observe its behavior.

"Dimensional similitude" is the key to scale modeling. Most hydraulic models retain the 3-dimensional proportionality of the prototype, but some are distorted in the vertical direction. The model must be operated in a manner that preserves the ratio of inertial to gravity force.

Stollmeyer's Automaton

Chapter 47 introduces wind-drive oars as a method to propel a vessel. When the utopianist C.F. Stollmeyer tested a model of the craft on the River Thames, however, rather than pushing the floats upward and generating power, the water flowed over them and the craft plunged beneath the surface. We've no information regarding the model, per se, but it provides us a good starting point on why it's well to model before production ensues.

Japan's Lake Ohnuma

We encountered the floating islands of Lake Ohnuma in Chapter 25, somewhat unremarkable peat flotations. Of modeling interest, however, is the report "Floating Islands: Japan Has a Lake of Them, and They Sometimes Capsize," Princeton Union, January 14, 1915, borrowing from "On Mysterious Motions of the Floating Islands in Yamagata, Japan," Science Reports of the Tohoku Imperial University 3:1 (1914), by S. Kusakabe et. al.

In Yamagata, Japan, is a small lake called the Lake of the Floating Islands, discovered about the year 1340. which has from that time attracted the attention of many poets and literary men. A report on the mysterious movements of these islands, drawn up by a party under Professor S. Kusakabe, is published in the science reports of the Tohoku Imperial University.

The floating islands, which at times number no fewer than sixty, are found to be continually changing their positions, moving first one way and then the other. In the first series of observations wooden floats were placed in the lake, showing the distribution of the various currents. Subsequently a model of the lake was constructed, and it was found possible closely to reproduce the various movements of the surface. When both water and wind currents were

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taken into account the actual behavior of the islands was found to be quite in accordance with theory and experiment. The islands originate from masses of vegetable debris, which are first carried to the surface by bubbles of gas then reeds commence to grow from seed on them. Sometimes the mass becomes top-heavy and overturns, and reeds grow on the other side, until the island has grown sufficiently large in extent to secure stability.

Again we're not provided information as to what the modeling entailed, but its apparent capacity for controlled experimentation allowed the investigators to study island movement.

Armstrong's Seadrome

As chronicled in Chapter 57, Edward Armstrong's mid-Atlantic Seadrome elicited promotional publicity for more than a decade. Armstrong built a 1:300 scale Seadrome model in 1922, its purpose being that of publicity, not meaningful testing.



Armstrong, with 1:300 model, 1922



1:32 model, 1929

In 1929, Armstrong assembled a 1-ton 1:32 scale mode of sheet steel, 35 feet long and 10 feet wide, having a draft of about 6 feet. Anchoring it in an arm of Chesapeake Bay, for six weeks, he tested it against a variety of wind, wave, and current conditions. Waves that swamped a 1:32 model of the liner *Mauretania* were said to barely disturb the Seadrome. The results, Armstrong asserted, indicated that a full-scale Seadrome in the open ocean could survive 280-mile/hour winds and waves 144 feet high.

From "Aeronautics: Seadrome," *Time*, October 28, 1929,

The model, 1/32 the size of intended seadromes, consists essentially of a rectangular platform. To its underside are attached hollow steel columns, each ending in a circular disk. Air in the cylinders was sufficient to keep the device floating on the Choptank and the platform several feet above the water. Speedboats dashed around the model. Their waves did not touch the platform nor did they rock it. The heavy horizontal disks at the lower ends of the hollow columns, below the depths to which the wave actions reached, counterbalanced all surface disturbances.

Missing is experimental data other than biased judgments and exclamation-pointed references to "speedboats." How Armstrong came up with "280-mile/hour winds and waves to 144 feet high," isn't revealed, In the subsequent 80-plus years of nautical modeling involving massive wave tanks, no investigator has achieved results even close to Armstrong's boast.

Armstrong demonstrating his 1:200 model to the president of Pennsylvania-Central Aviation, "Airports at Sea," Flying, August 1943. While the project was by this time long dead, the inventor still had his model.



Habakkuk

A hobbyist's 1:700 model of the pykrete-ship Habbakuk (Chapter 60) some 60 years after the fact. The superstructure is conceptual, as actual design never progress that far. Note the side-mounted propeller pods.

The real modeling, however, took place in early 1943, a 1:10 model (in width and height, but not in length) was fast-tracked on Patricia Lake, near Canada's Jasper National Park, to test the ice ship's constructability. Construction was done by conscientious objectors who were never told what they were building.

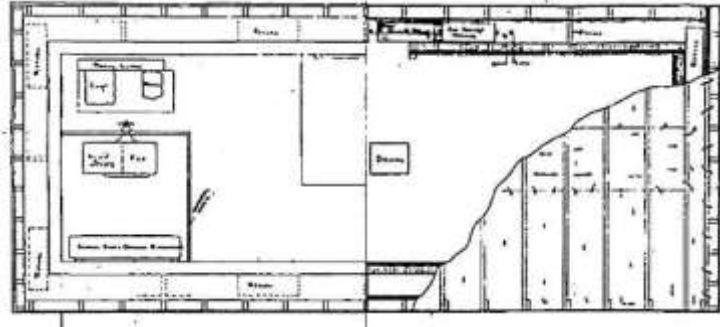


	Model	Prototype
Height (feet)	18-20	200
Width (feet)	30	300
Length (feet)	60	2000
Displacement (tons)	1,000	2,000,000

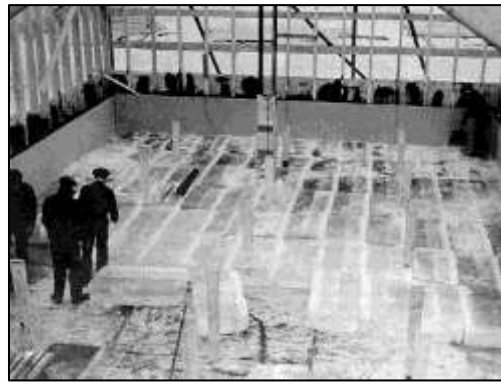
Though ice can resist a sharp the blow, it is less resistant the continuous pull of gravity. A large mass of ice gradually sags under its own weight. Pykrete sag more slowly, but not slowly enough, unless it is cooled. A pykrete ship's hull would have to be protected by an insulating skin, and its hold would have to carry a refrigeration plant supplying cold air into an elaborate system of ducts. More than would the ship float? -- there was ample evidence that it would -- the modeling had to address the practicality of on-board refrigeration.

Blocks of regular ice (not pykrete) were cut from the lake, assembled, and kept frozen with with embedded air ducts fed by 1-horsepower of refrigeration.

The model's refrigeration chamber, double walling and flooring.



It became obvious that more steel reinforcement was needed, as well as enhanced insulation, but the big question -- that of cooling -- proved to be surmounted.



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The model was topped with a tin roof to make it look like a boathouse

The cost of building a full-sized Habbakak was estimated to be \$70 million, less than half that of a conventional carrier of comparable size. The model and testing cost \$150,000.

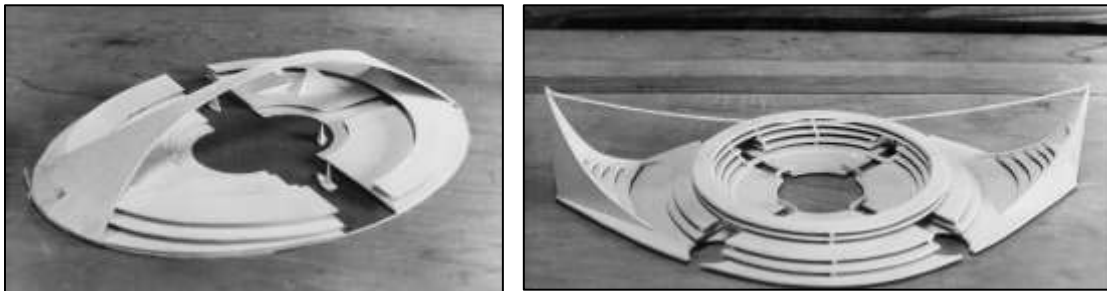
In unveiling the work to the Allied chiefs that August, Supreme Allied Commander Lord Mountbatten set out two blocks of material and pulled out a pistol. The first shot shattered a block of pure ice. When Mountbatten fired at a block of pykrete, however, the bullet ricocheted across the trouser leg of Fleet Admiral Ernest King. His Lordship had made his point.

Although the Patricia Lake modeling was successful, full scale construction never took place due to costs, limited resources and the success of Allied aircraft flying longer ranges to scout for U-boats.

The 1:10 Habbakak did not melt until the end of the following summer.

Craven's Hawaiian Aquapolis

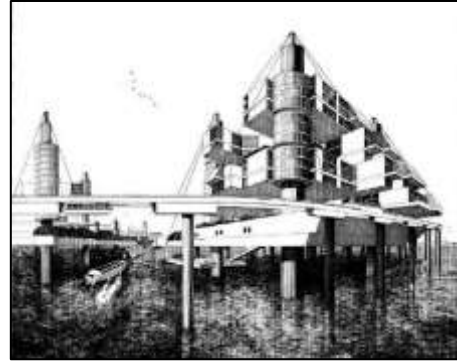
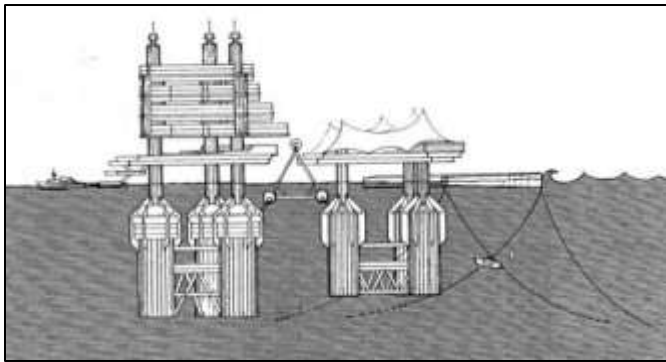
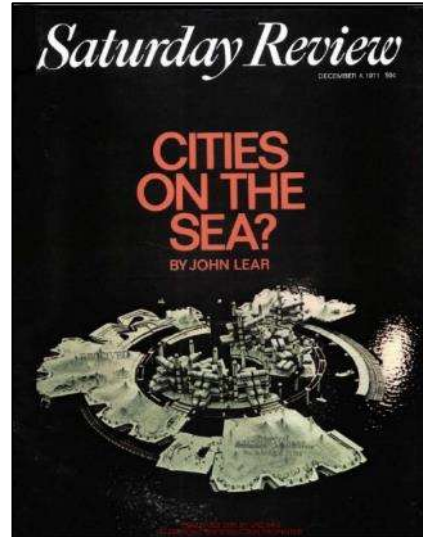
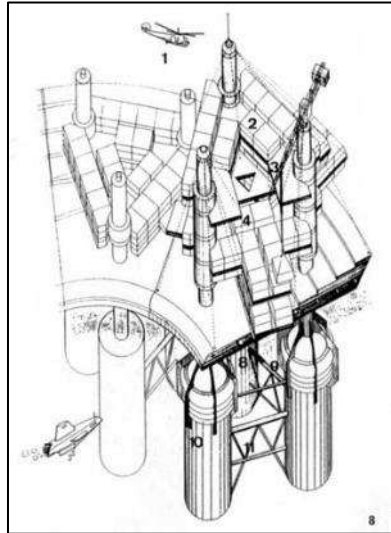
John Craven's vision for Hawaii was a 1/2-square-mile floating platform, complete with hotels, exhibition halls and restaurants, "Aquapolis," as it would be touted in its intended home, Hawaii.



Stylized concepts of "Aquapolis," Honolulu Advertiser, March 11, 1971.

Kiyonori Kikutake
(architect of Okinawa
1975's Aquapolis
(Chapter 70) provided
the design.

On the far right, the
front cover for "Cities on
the Sea?" Saturday
Review of Literature,
September 4, 1971,
John Lear



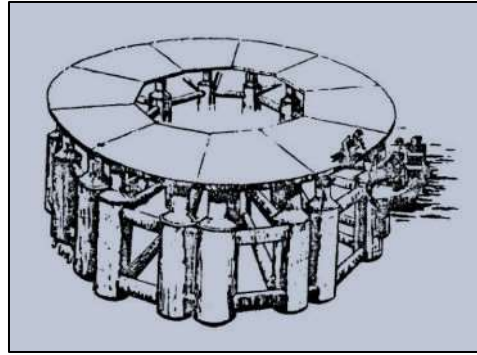
Craven's enthusiasm for the endeavor was unbounded. From his "The Maritime Dimension" in How Bog and Still Beautiful? Macro-Engineering Revisited (1980), an American Academy for the Advancement of Science symposium,

Although it is true that most architectural models and drawings are beautiful, whether or not the prototype proves to be so, the floating city model leaves little doubt of grace and beauty. The webbed curtains which are employed for screening sun, and a windbreak, provide the graceful flowing surfaces which carry the eye from the horizontal surface of the water to the delicate minarets. No structure above the surface is more than eight stories tall, nor need it be, for the bulk of the usable volume is located below the surface. The total design, though big, is beautiful; it is functionally complete, a concept of land and sea, king of beauty, and a joy forever.

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Craven refers to Kikutake's table-top display pictured on the Saturday Review cover, created for presentation purposes and far smaller than Craven's 1:20 testing model, devoid of "grace and beauty," 17 feet tall, 50 feet in diameter, divided into ten clip-together modules, each of which had three vertical tanks, the lower ones ballasted, the upper ones providing buoyancy.

Some accounts say the steel unit weighed 150 tons, others, 85, and other 50. Budgeted at only \$85,000, it took the help of 130 volunteers to build.



Structural components and working on the floating model

Testing progressed in Kaneohe Bay until an over-zealous tow boat pulled the structure so quickly that water flooded the flotation tanks. The headline of the following day: "Floating City Sinks to the Bottom of the Sea."

From Craven's The Silent War: The Cold War Battle Beneath the Sea (2002),

The sinking had less to do with the floating city's floatability than with its shoestring budget. There was no money to pay for hatches and other closures on the above-water parts. The Navy had been towing it from one area of the bay to another when a rope broke and the remaining tow began to pull it underwater. The more the tugboat pulled, instead of stopping, the more the floating city model flooded. The press had a field day. In spite of this major mishap, the floating city was resurrected in three days. By then, however, the media had lost interest and remained unimpressed.



The model was eventually scuttled near Coconut Island, where it sits today.

Fuller's Triton City

Buckminster Fuller speaks of "models" in Critical Path (1981).

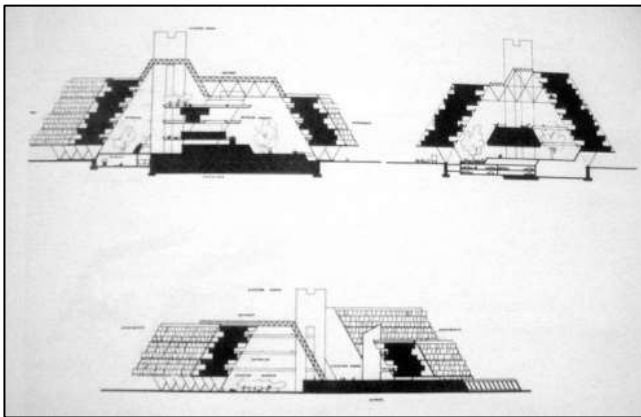
You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.

Fuller meaning of "model" here is that of ideas, an arena in which he flourished. But Fuller, like most architects, also created scale models embellished with miniaturized detail to communicate a design. It is such a model, one of a floating island, that we turn.

Fuller was commissioned in the early 1960s to design a floating city for Tokyo Bay (Chapter 70). To this end, Fuller conceptualized a tetrahedron having a 3.2 kilometer base and a height of 2.3 kilometers. It was to house 100,000 people.

After the death of the project's Japanese patron in 1966, sponsorship of a smaller project to house 6,500 was taken over by the United States Office of Housing and Urban Development.

A single neighborhood module of 20-story the Triton floating city. Three to six such neighborhoods combine to make a town, three to seven towns, with the addition of municipal modules of appropriate size, a city. Made from steel or concrete, these structures could be constructed in shipyards and towed to their destinations. Twenty to 30 feet of water would be sufficient to float the modules.



Triton design



HUD official, a model and Fuller

Again, from Critical Path,

With my associates I completed the design and study as well as a scaled-down model. The studies showed that the fabricating and operating costs were such that a floating city could sustain a high standard of living, yet be economically occupiable at a rental so low as to be just above that rated as the "poverty" level by HUD authorities. The secretary of HUD sent the drawings, engineering studies, and economic analysis to the Secretary of the Navy, who ordered the Navy's Bureau of Ships to analyze the project for its "water-worthiness," stability, and organic capability. The Bureau of Ships verified all our calculations and found the design to be practical and "water-worthy."

Fuller's model, however, was solely for artistic presentation. Despite his assertion, the assemblage was unsuitable for physical assessment of "water worthiness" or hydraulic testing for "stability."

The city of Baltimore became interested in acquiring the first such floating city for anchorage just offshore in Chesapeake Bay, adjacent to Baltimore's waterfront. At this time President Lyndon Johnson's Democratic party went out of power. President Johnson took the model with him and installed it in his LBJ Texas library. The city of Baltimore's politicians went out of favor with the Nixon administration, and the whole project languished."

The Triton model now resides as a curiosity in the Lyndon Baines Johnson Library in Austin.



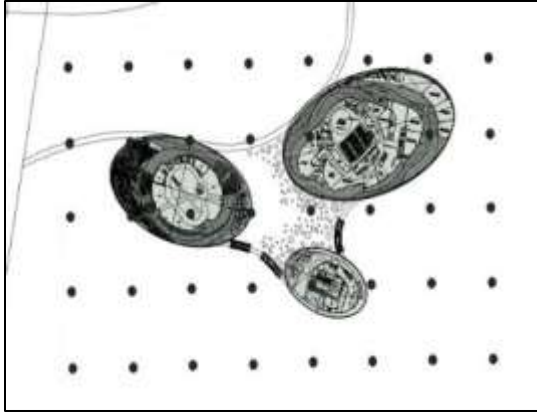
Seoul

Chapter 65 describes the floating islands constructed in Seoul's Han River. To test the effect of island layout on water surface profile, vortex formation and bed shear under various flow conditions, a physical model, scaled 1:120 vertically and 1:50 horizontally, was employed

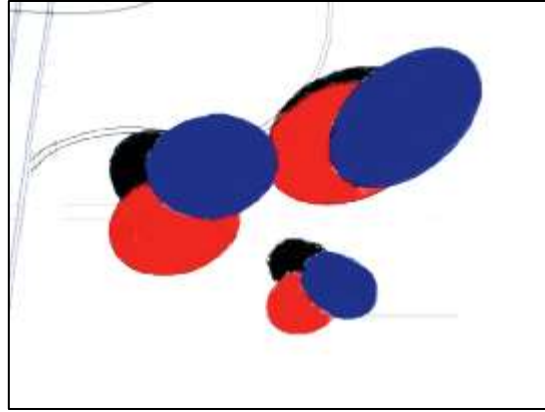


The model

In its natural state, flow to the left of the floating islands site was a stagnant with weak whirlpool. Three island placements were tested to eliminate the whirlpool's impact



Velocity measurement locations



Black Original Design
 Red Revision 1
 Blue Revision 2

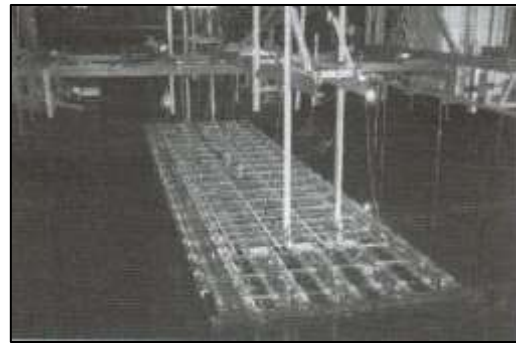
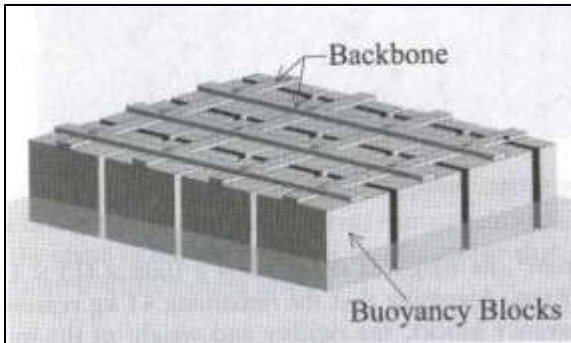
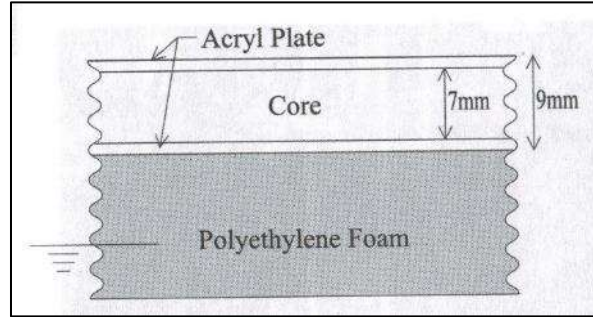
Mega-Float

Chapter 57 introduced the Japanese Mega-Float, a 4000 meter sea-borne airport to be comprised of prefabricated modules. Design involved two scale modeling approaches, one in the lab, the other in Tokyo Bay.

The laboratory work involved testing three module configurations, 1:100 scale, in a wave tank.

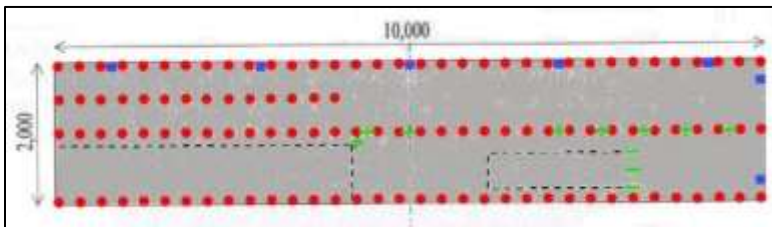
	Model	Prototype
Length (m)	10	1000
Breadth (m)	2	200
Height (m)	0.07	7
Draft (m)	0.015	1.5
Displacement (kg)	300	307.5×10^6
Longitudinal Rigidity (Nm ²)	1.46×10^9	1.46×10^{13}

Model construction included sandwiched buoyant foam and overlying backbones.



Measuring items and measuring devices

Measuring items	Measuring devices	Measuring points
Vertical displacement	Potentiometer	102
Structural strain	Strain gauge	16
Horizontal displacement of mooring point	Laser-type displacement sensor	7
Wave height	Servo-type	3

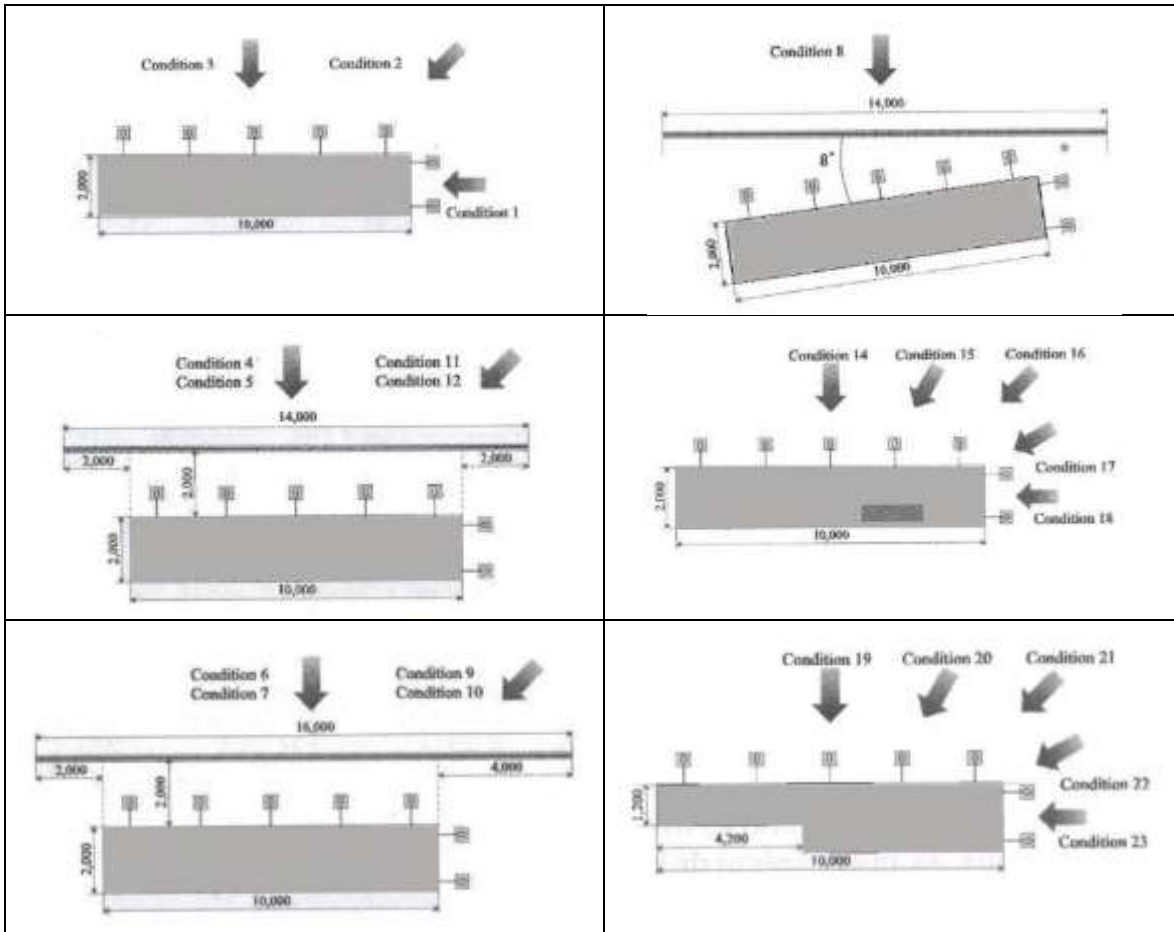


- Vertical displacement
- Strain
- Mooring

Configurations

M1	Basic model having a structure of a 5-millimeter thick aluminum plate with a 65-millimeter thick polyethylene foam for buoyancy.
M2	Doubling a 5-millimeter thick aluminum plate on 2 meters by 0.5 meter of M1 with adhesive agent and rivets.
M3	L-shaped structure made by cutting off part of M1.

Various angles of wave action with and without a breakwater were tested,



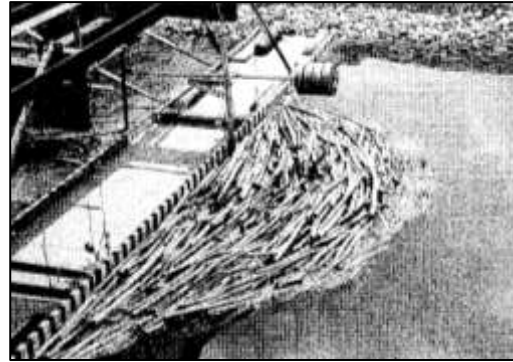
Mechanical responses within the model are recorded, appropriately up-scaled to prototype conditions and engineering design follows.

Although Mega-Float seems not to be economically justified in the foreseeable future, physical modeling has revealed no technological infeasibility.

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Bridges

Bridges are commonly modeled to evaluate the effect of the piers and abutments on river currents and -- often more importantly -- to predict scour. We've one modeling example, however, where the question related to the behavior of a floating island trying to pass under a bridge. The island is one of logs (Chapter 27) and the experiment is a 1:16 model at the U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.



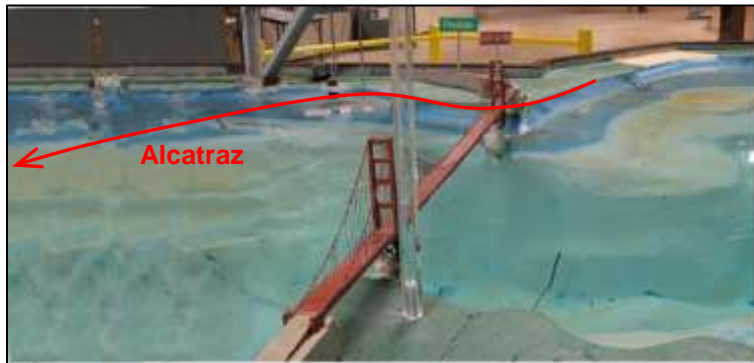
Alcatraz

Chapter 30 quotes Gary Mull's geologically-astonishing revelation that Alcatraz Island, the one-time inescapable federal prison in San Francisco Bay, consists of pumice and has been anchored to preclude its wanderings.

One can take the tour for \$30 and judge the island's stability first hand, but for free, one can visit the US Army Corps of Engineers San Francisco Bay Model, just north in Sausalito.

Below, the route of Alcatraz Island superimposed on a photo of the model, scaled 1:1,000 horizontally and 1:100 vertically. The island-floating experiment has never been run, however, because, for reasons explained by Mull -- the movement is a state secret.

If the model were operated, however, and Mull has the facts, here's (with proper security clearance) what we might watch.



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CHAPTER 77

TOW IT

Serious exertion is required to tow an island. We'll begin with an artistic encirclement of Manhattan, move to massive works by world powers, and then to some American lakes and conclude with a poem.

East Side, West Side, All Around the Town

"It's Not Easy Making Art That Floats," New York Times, September 16, 2005.

The culmination of more than 30 years of sporadic efforts to build the ambitious floating artwork that Mr. Smithson sketched out in a rough drawing three years before he died in a plane crash in 1973, an image that showed a tiny, forested, man-made island being towed by tugboat with the city's skyline in the distance.



How, for example, do you ensure that 20- or 30-foot-tall trees, unearthed and with no root systems to speak of, stand up straight and do not topple in a stiff wind?

A barge yard had to be found in a location that would allow the unearthed trees, coming from a nursery in New Jersey, to be delivered quickly, to reduce wilting and damage. The trees had to be chosen very early on, because by late summer the selection at many nurseries would be slim. In the drawing Smithson specified that the trees should be common to the New York region, and long debates began over which types of trees were native and which weren't. (Interestingly, the weeping willow is not a New York native.)

The three rocks eventually were borrowed from Central Park, to which they will be returned; the trees will also be planted in Central Park after the island ends its run.

The first arrival was the blackish dirt, almost 50 tons of it, from a composting heap in Fairfield, N.J., and 18 tons of hay bales, which would be hidden underneath the dirt to provide bulk but less weight. Next the trees arrived - maple, beech, birch, bur oak, sycamore - and were plunked by crane onto the barge, their truncated roots wrapped in burlap and wire cages. A dogwood -- later referred to by everyone as "the unfortunate dogwood" -- arrived looking closer to firewood than living tree and had to be replaced. The willow, unfortunately, didn't look much better.

Shrubs -- witch hazel, chokeberry, hydrangea, blueberry, sumac -- added to the strange verisimilitude. Four extra trees were added, at a cost of several thousand dollars. An ailing sycamore went the way of the dogwood. A damaged steel panel was replaced. And on a maiden test-run voyage to Manhattan on Wednesday, birds, lo and behold, began to land on the island even before the birdseed was applied.

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Posthumously realized in 2005 from a sketch made in 1970, the island was towed around Manhattan for a week.



In a 2009 homage to Smithson, artist Mary Mattingly turned the idea into "The Waterpod" on a rented barge 300 meters square. The post-doomsday survival statement constructed from recycled and donated materials featured two geodesic Buckminster Fuller domes, a hydroponics garden, water catchment and filtration, solar panels, an electricity-generating bicycle and a dry-composting toilet.



Smithson wasn't the first to grace Manhattan with a floating island, however. "Floating Island," Buffalo Courier Express, October 6, 1957, scoops him by 18 years.

There's a new island in the world, and it fulfills all the requirements of any tropical paradise, with waving palm trees, soft sands, and lissome native girls. The only trouble is that it can't be found on any map -- it keeps popping up in too many different places. This "island on the run" is skippered by Paula Muller, a former actress, fashion model, and crane operator, who is the only barge captain on the East Coast. She helped design and build her unique "craft," now located off New York City. The idea grew out of a contest which offers an honest-to-goodness Bahama Island, guaranteed not to float away, as first prize. With no way to show off their faraway treasure, the sponsors called on Paula to create a replica of the island on her barge. For materials, they gave her 168 tons of pink sand, palm trees, hibiscus blossoms, thatched huts, and bathing beauties.



White Nile

Given the many references through the previous chapters, we're well aware of the "sudd" of the upper Nile. For the purposes of those chapters, the biomass characteristics didn't need to be specified. For the purposes of removing the growth, the characteristics are formidable.

The word "sudd" is derived from the Arabic "sadd," meaning "block," and that translation was oft used by British colonials. "Sudd," with a capital S, refers to the swamp the size of England along the White Nile, the nearly intraversable expanse of bog and thicket that stymied the European

quest for the headwaters for more than a century. Sans capitalization, sudd refers to a floating mass of vegetation that may obstruct navigation in tropical rivers.

Typha dominguensis (southern cattail) covers about three quarters of the total swamp, bordering *Cyperus papyrus*, which forms a central core. Water hyacinth forms an almost-ubiquitous floating fringe.

In terms of management, papyrus is the root of the problem, "root" being more than metaphoric. Roots extending into the riverbed fix the formation in place, not to be freed until extraordinary flooding rips the biomass free or human intervention is applied to sever the tether.

The 60,000 square kilometer Sudd forms where the Nile enters some 400 kilometers of almost absolute flatness. Flow has little appreciable gradient to follow and no defined basin in which to pool. Without intervention, nearly the full 400 kilometers is blocked with growth.

"Cleopatra's Promise," Adventure, June 15, 1935, by Talbot Mukdy, however, appears to float the islands rather too far downriver.

"Now then: do you know of a place, half a furlong to westward, near the public bath-house, where a boat might make an unseen landing in the reeds?"

"Aye, master. Where the south wind drives the floating islands inshore. It is the place where the runaway slaves hide until nightfall and as often as not get snapped up by crocodiles."

While the ancient Egyptians would have been aware that far to the south, the Nile was jamed with vegetation, the remnants of the formations wouldn't have floated to Cleopatra's empire.



Empire can be extended by military conquest or economic annexation, and in the case of the British East Africa, river transport could achieve both.

From The Uganda Protectorate (1902) by Harry Johnston,

It is difficult to guess what might have been the outcome of the sudd growth on the Nile but for the action of European man. The work of cutting through this obstruction, which was conducted by Major Malcolm Peake, R.A., C.M.G., was one of the most creditable actions which white civilization has produced in Africa. The results which should follow on free navigation between Khartoum (now connected with the Mediterranean by railway and steamers) and the northern frontiers of Uganda will be of the greatest benefit to the starved and miserable natives of the Nile bank and the isolated and sickly Europeans who upheld the Uganda Administration.

In 1899, the Egyptian colonial government determined to clear the upper Nile, and the task was entrusted to Maj. Malcolm Peake of the Royal Army. Peake worked with 5 gun-boats and 800 Dervish prisoners, guarded by 100 black soldiers, 5 English officers and several Egyptian commissioned and non-commissioned officers.

Workers cleared the top of the sudd by burning, if possible, and then employed large saws to dismember what remained into manageable blocks. A steamer bow was rammed into the block and a steel hawser was placed in a trench cut and trodden down. The steamer then backed away at full throttle, the men standing on the hawser to keep it in position. Tough sudd could require as many as 20 trials to tear free.

"Clearing the Nile of Sudd," North Platte Semi-Weekly Tribune, November 20, 1900,



One of the results British occupation of Egypt has been the opening of communication between the White Nile and the Nile, which every year is interrupted by the "sudd" or floating islands of marsh which obstruct navigation in the Nile between Fashoda and Lado. Under the old regime, many efforts were made at various times to remove the "sudd," and some these attempts were temporarily successful, but the effect of the work was not lasting, and soon the channel filled again. Under the Dervish rule, nothing at all was done in this direction. But after reconquest of the Soudan, the Egyptian government took up the problem, and last winter began a fresh attempt to remove the "sudd."

These "sudd" marshes are probably the largest series of marshes in the world. Although the actual limits are not known, the total area is placed at not less than 12,000 square miles. The depression which they occupy was once a lake. Here grows the papyrus; the Um soof, by which name, meaning "Mother of Wool," the Arabs call a tall reed which is covered with prickly hairs; the ambatch, a tree-like shrub which is lighter than cork, and many flowering creepers which twine through the mass and add to the tangle.

From "The Barrage of the Nile," National Geographic, February 1910, by Day Willey,

The way in which the channel is cleared is as follows: Often the water is so completely hidden that the first difficulty when you are encountered by a barrier of sudd is to discover where in this sudd the river bed runs. This is done by "sounding" through the sudd with long poles. The average, depth of water in the sudd may be only a few feet. But when the actual river bed is reached, this suddenly increases to a depth of 15 to 18 or 20 feet. Having found the real river bed, the first thing to do is to cut down or burn the top growth, consisting mostly of papyrus. Having cleared the top of the sudd "block," the men are landed with large saws to cut along the true river bank, which may be either submerged with a few feet of water over it and papyrus and sudd on it, or solid ground with ant" heaps, the solid ground never being of any great extent and always surrounded by swamp. Cross and parallel cuts with the saws are then made through the sudd, dividing it into blocks of a convenient size for the steamer to tear out, the size of these blocks, of course, depending on the consistency of the sudd and the power of the steamer.

Having cut the sudd into convenient blocks, the bow of the steamer is run into the block, a loop of steel hawser is placed around it, when the rolls of the cable are passed over the bows of the steamer. Here it is taken by the men on board and placed in what is called the trench cut, and

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held down with their feet. The steamer then goes full speed astern, the men all standing on the hawser to keep it in position. In the case of tough sudd, as many as twenty trials may have to be made before the block of sudd eventually tears away.

Kamongo (1932) by Homer Smith, about Lake Victoria:

Each morning a gang of convicts would pass by our door on the way to the shore where they were cutting out papyrus... I could watch the prisoners working on the shore from our front porch; armed with big knives, jembies, and ropes they would walk out on to the islands of papyrus that had blown in from across the Gulf [the Kavirondo Gulf at the eastern end of the lake] and cut off the feathery tops. Then they would cut out big blocks of root and, working a rope around them, pull them ashore where they burned them.



Technically "sudd," not "Sudd," as it's in Lake Victoria, 1930s

"Fighting the Nile Sudd," Pearson's Magazine, July 1901, draws from Peake's journal.

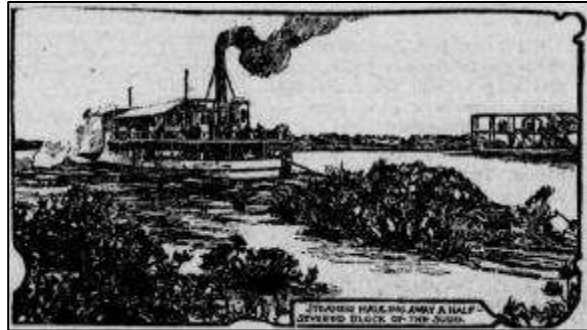
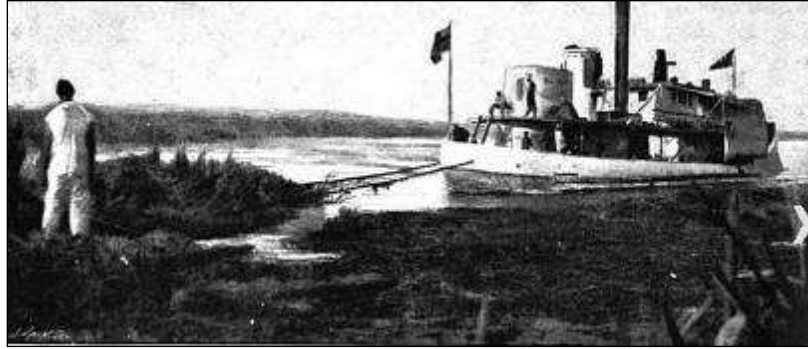
I wish I could explain nicely what the river is like. When one arrives at a block it is very curious. All of a sudden the river ceases to be.

Now, as to how we do it. On arriving at a block we tie up the steamer, and set everything on fire, then cut down all the dead papyrus, which is on the sudd, until it soon looks like a very rough field. Then this field is dug into small sections four or five yards square; the trenches are dug to about two feet under water, the sudd itself being one, two, or three feet above water, and from six to ten underneath. Next we put pieces of wood round our section (cut up telegraph poles), fix a wire hawser round the section, shoved well down in the trenches and behind the posts, and bring the two ends on the steamer. The steamer then backs astern and eventually pulls out the section, which floats away downstream. The wire is got on board again, the poles recovered, and the steamer proceeds for another section. The force and jerk which the steamer brings on the wire severs the roots of the section underneath from the others -- or at least some times does. That's the idea.



Men holding the hawser in position.

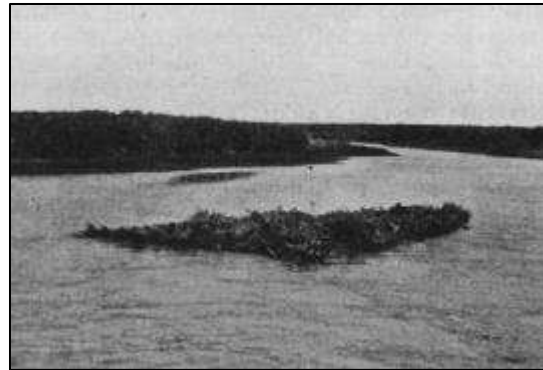
Sudd-clearing steamer tearing out the obstruction with steel cables.



Again from "The Barrage of the Nile" by Willey,

When the block is torn out, the steamer goes slowly astern till the mass is pulled clear into the current, if there is one, when it is cast adrift to float downstream, where it is gradually disintegrated. If there is no current, it is towed to a piece of open water, where as a temporary measure it can be tied by ropes to the bank, leaving a wide enough channel for the steamer, and or the appearance of a current to be cut adrift to float downstream.

When a block was at last freed, the steamer towed it into the current -- if there was one -- releasing it to float downstream where it would disintegrate. If there was no current, the block was towed to open water to await the annual flood.



The Panama Canal

Gatun Dam flooded the swampy area of the Chagres River, causing loose vegetable matter, logs, branches and small trees to rise to the surface and drift around the lake, eventually becoming floating entanglements 200 to 500 feet in length, soon covered with grass. Such islands were towed to the spillway and floated over the dam.

From "Nature Turns Gatun into Garden of Experiment," Princeton Union., February 19, 1914,

*Another crop that is growing in Colonel Goethals' garden is the floating island. These islands are masses of earth, grass and decaying vegetation, which are so light that they rise from the bottom of the lake. They are blown about at the will of the wind. On this account one sees the broad expanse of lake blue and unfretted in the morning, but when the trade wind springs up in the afternoon the lake is dotted by scores of islets that were not visible a few hours before, having been lying close to the shore and seeming a part of the hills. *

Some of these islands are so strong that a man can walk upon them others so filmy that only the bird finds safe footing. They are a real detriment to navigation and will be towed to the brink of the spillway by launches and then pushed over. There are hundreds of these, but once disposed of they will give no further trouble.



Floating island hemming in a motorboat.



Argentina

"Floating Islands, Homeless Wanderers on Great South American Rivers," New York Tribune, August 27, 1905, on Río de la Plata and the Parana,

Owing to their floating population there is no disposition on the part of anyone to stop these islands, and in a number of instances tugs have been sent out to push them back into the current where they show a tendency to ground along the river bank, and as the wind has been in the right direction to assist this, the islands are now sailing out to sea.

Finland

"Finnish Floating Island Finds New Home," UUTISET, July 7, 2015

Mysteriously, a small islet covered with birch trees drifted around for a couple of weeks this summer before being temporarily harnessed near the center of Rautalampi, a small municipality between Jyväskylä and Kuopio.

Since it has been tied up along the shore, officials have been worried that it would attract adventurous explorers. There are fears that someone could easily fall through its shallow, swampy soil and become trapped under it, with potentially tragic consequences.



The town's technical director, Hannu Poussu, has come up with a battle plan that involves piercing the peripatetic landmass with wooden spars aimed at curbing its nomadic lifestyle. If the island still seems overcome by wanderlust, it will be attached with strong cables, as it is now on the town lakeshore.

The island was seen drifting for at least a week and a half, travelling several kilometers southward from Lake Lonkari through the Kattilavirta strait to Lake Äijävesi. There it was captured to avoid having it sail onward, amid concern that it might have become stuck under the Toholahti bridge.

According to the newspaper Savon Sanomat, the natural raft measures about 10 by 20 meters and is about one meter thick, including some 200 square meters of soil and birch trees measuring 7-8 meters high.

At first a local tour operator was interested in towing the islet to his shore as a tourist attraction, but gave up on the plan due to the possible danger of stepping onto the floatation.

Why the landmass began its voyage is unclear. Rescue officials speculate that it may have been detached by explosions set off to break up heavy ice jams last spring. On the other hand, there is a local legend whereby the island has been floating for years, rather than weeks.

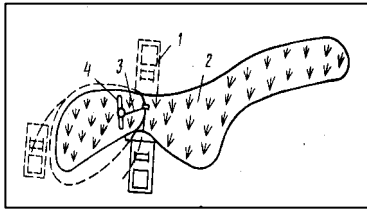
Soviet Union

The titles from Gidrotekhnicheskoe Stroitelstvo [Hydrotechnical Construction], 1952 and 1963, respectively, catch some of the management militancy.

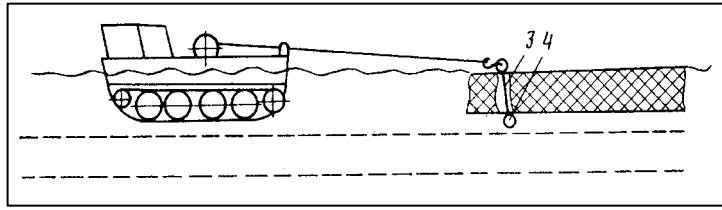
"Struggling Against the Floating Peat Islands" by B.N. Shevelev, G.S. Safrazbekyan and P.F. Floating islands first appeared in an unspecified reservoir in 1947, the largest being 3 kilometers in length. Some of the islands were broken into smaller pieces with explosives and others were towed away from the dam to prevent their interfering with hydroelectric generation.

"Experience of Fighting with Floating Peats at the Novosibirskoye Hydropower Station" by V.A. Komissarov. Following the reservoir flooding in 1958, floating peat islands had to be cleared from the machinery almost daily, resulting in a loss of 78 million kilowatt-hours of production; The losses decreased greatly after the islands were towed to diversion canals or anchored in shallows.

USSR. patent 3980603, 1985, describes a method for controlling floating such islands



The process of dismemberment



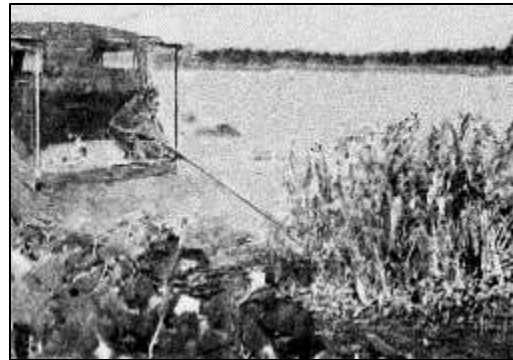
Towing the island by a floating tractor equipped with a winch rope choker hook suitable to the floating island

Florida

Attempts have been made in Florida to steer floating islands using boats and anchor them elsewhere

"Sailboat Islands," Ocala Star-Banner, August 7, 1955

Building the flat-bottomed, barge type boat, McKav literally went out and lassoed the smaller floating islets and towed them into the flats in front of his property. He learned the hard way that while the wind could send the islands scooting across the surface at unbelievable speeds, they were an unwieldy dead weigh on a towing line. It required endless hours of tugging and lifting to maneuver the heavy vegetation across shallow places into the desired position.



Pushing a small floating island on Lake Kissimmee.



"Pulling a Floating Island, Mc Intosh, Fla, U.S."



To assure domestic voting tranquility, the State of Florida will be detached from the United States Nov. 1 and towed out to sea for 48 hours. -- 2004



California

Closer to home, "Beautiful Floating Gardens Make Appearance on Reservoir: Crowley Lake, Near Bishop, Has Unusual Display as Mountain Meadow Sod Rises to Surface of Water," [Los Angeles Times](#), August 5, 1941, reports on conditions at Crowley Lake, one of the city's reservoirs.

Large sections of this mountain meadow sod, loosened by the mounting waters of the lake, have risen to the surface of the water and now are floating about like their famous counterparts in Mexico.

Afraid they eventually would pile up behind me newly constructed dam and cause damage, Los Angeles' Department, of Water and Power officials had them moved in near shore where they have been securely anchored, but are still afloat.

The largest of the islands was about an acre.

Idaho

High water and heavy winds caused 4-acre parcel of pines, moss, cattails and brush to break its tree-root moorings in Thompson's Lake and drift a quarter-mile, engulfing a boat ramp. "Lake Residents Check Out Express Isles -- Several Thompson Lake Islands Cut Loose In Storm, Sail Into Residents' Yards," [Spokesman Review](#), December 18, 1995, reports on the event.

Wilma Schorzman, 71, wandered into the kitchen that morning to put on some coffee. She glanced out the window at the lake.

"And there it was," she said. "I saw an island that used to be about halfway to Harrison."

"There's 30-foot pine trees on it," she said.

The islands had sailed in under cover of darkness, with their two dozen pine trees and five manmade goose-nesting platforms intact. The islands lodged in the cove where Thompson Creek runs into the lake.



Bathtub-size chunks of the islands lie strewn about Thompson Lake's high-water mark.

"You get enough organic material in there and it'll float." said forest hydrologist Douglass Fitting.

The islands will probably stay in their new home, said navigable waters specialist Jim Brady, That's because the lake's water level has dropped, and runs of the floating Islands are likely now resting on the lake bottom.

"I don't think there's enough horsepower on this lake to move them," Brady said Thursday, on a visit to the lake.

The islands moved once before, in May 1926, according to self-described old-timer Frank Thompson. The lake is named after his pioneer grandfather, William J. Thompson.

"It was a boisterous spring," recalled Thompson. 78. "The west-end peat bogs, with trees on them, floated up the lake."

Buck then, he said, a neighbor tried to head one of the islands off.

"He got out there with his power-boat and tried to pull it out of the way," Thompson said. "He couldn't stop it."

Thompson said the islands of 1926 settled at the mouth of Thompson Creek, the same place this last batch landed.

Now [Evan] Jones, who swears it's solid ground, pastures cattle on the spit of and. He's even plowed it with a tractor.

Floating islands had been reported earlier than in 1926, in fact. "To Move Isles," Oakland Tribune, October 25, 1917,

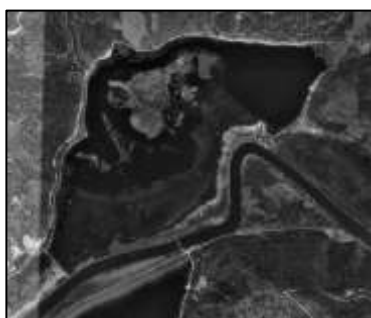
Two floating islands, which have been cruising about Lake Coeur d'Alene during the summer, have started to the Pacific Ocean through the Spokane River, and are holding up navigation of log-boom tugs. Declaring that there is danger that the source of the river would be entirely blocked in case of high water, lumbermen have appealed to the county commissioners here to get the islands out of the way.

Thomson's Lake is just upstream to Lake Coeur d'Alene, which outflows to the Spokane.

While the power boat effort drew media attention in 1995, the subsequent two decades reveal repeated episodes of floating islands throughout the lake.



December 1995



June 1998



September 2004



September 2005



September 2006



May 2009



August 2009



August 2011



August 2012



July 2013



May 2014



August 2014



"Lake Float Astonishes Fishermen," Spokesman Review, August 4, 1960, describes towing another floating island float, a play on words, perhaps, but an accurate description.

Fishermen on Lake Coeur d'Alene Saturday evening were startled by a strange and beautiful sight: A floating island of glistening white, with a throne and canopy of flowers and graceful swirls of gold ornamentation. In the glow of sunset, it moved majestically upon the water.

Boats began to circle the barge, forming an escort of honor; for many recognized it as the prize-winning Eagles float which had first appeared in the Coeur d'Alene Fourth of July parade. Towed by a small outboard manned by Vic Kennedy, Coeur d'Alene dentist, it was Harrison-bound for the Old-Timers' picnic.

In the memory of Coeur d'Alene lake-dwellers, it was the first time a float was ever actually "floated" to a parade destination.

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Illinois

"Chain O' Lakes Crews Secure 'Floating Island," Chicago Tribune, June 18, 2008, regarding the land mass plugging the channel connecting Grass Lake and Lake Marie.

Fox Waterway Agency workers temporarily staked three massive floating bogs to the Grass Lake shoreline Tuesday, preventing a potentially dangerous backup of floodwater from the Fox River. The bogs had broken off from the Chain O' Lakes State Park and Conservation Area.

The "floating island," as agency workers called it, actually was made up of at least three smaller bogs totaling roughly 12 acres. The bogs are chunks of wetland formed by cattails and other aquatic vegetation not firmly rooted to the lake bed. Fast moving floodwaters, like those seen on the Chain in recent days, often cause the land masses to break free, officials said.

With floodwaters on the Chain expected to crest as early as Wednesday, agency officials worked furiously Tuesday to secure the bogs, using grappling hooks to catch hold of the bogs and more than a half-dozen boats to push them to the Grass Lake shoreline, said Ron Barker, the agency's director of operations.

"The Blob is on the Loose. Antioch Lake Homeowners Await Taming of Bog" Daily Herald, April 13, 2011.

A floating bog is terrorizing homeowners in a cove on Lake Marie in Antioch. Homeowners and local officials said the 100-by-100-foot bog is made of vegetation and mud and is estimated to weigh 20 tons



The Blob -- better known as a 100-by-100-foot floating bog made of twisted cattails, waterlogged weeds and muck -- has been drifting from shoreline to shoreline in the small cove on the eastern part of Lake Marie in Antioch since the winter ice melted.

The damage the bog causes has prompted pier owners to delay installation this spring until it can be removed.

Ingrid Danler, executive director of the Fox Waterway Agency, said a bog is a floating island capable of moving with the wind across any lake. The agency know it's trapped in the cove, Danler said, but the weather has prevented crews from returning it home to Grass Lake.

Numerous boats will be needed to push the bog across the water from behind, she said, although no one is sure how many will be needed to do the job.

"People don't realize that, like an iceberg, most of its mass is underwater," she said.

"That 100-foot-by-100-foot bog weighs about 20 tons and will take considerable time." The bog may have been pried loose from Grass Lake during flooding last spring when the agency spent the better part of two weeks capturing and reattaching bogs in Chain O' Lakes State Park, she said.

Maine

Legislative Record, Maine House, April 16, 1965 "An Act to Remove Floating Islands in Toddy Pond in Surry," contains the debate regarding state responsibility -- or lack thereof -- for the removal of errant land masses.

Chapter 77 -- Tow It

Mr. Anderson, quoting from an unattributed news article, "Floating Island Appears in Hoddy, Startles Camper"

"Surry, The road was familiar. The camp looked the same, but Miss Abbie Ingalls thought last Friday morning that her eyes were deceiving her when she saw a large island parked in the cove in front of the camp. It hadn't been there Wednesday. Estimated to be at least 200 hundred feet long and up to fifty feet in width, the brush covered floating island with some half dozen trees appeared from no one knows where and camp owners, Miss Ingalls and Miss Lena Cunningham are wondering what to do about it. The two women are concerned about rental prospects since swimming and boating are blocked by the island which lies within several yards from shore."

We submit that this is a menace to life, health and property. Now back in 1945, this same condition occurred at Lake Corundell and at that time it was established that it was the responsibility of the Forestry Department and that is under Chapter 138, Private and Special Laws of 1945 and at that time five thousand dollars was appropriated to remove the island.

Now, boys swimming here are bound to get on this island and there was a very near fatality there last summer when one boy broke through this island, and they had to put planks on the island and get out to him and snake him out of there.

Now, the water, it completely covers off and encloses a cove and there is a terrible odor from decaying vegetation. And this is certainly a menace to health. Miss Cunningham and Miss Ingalls have made a very conscientious effort to remove this island.

They had two so-called bees when all the villagers turned out. They had five motor boats there, outboard motors, boats with powerful motor trying to move it, and men waded out into the water with long poles but every attempt was futile. And then they had the thought that they might saw through it and break it up into sections with chain saws, but this proved to be too dangerous. And then they had the thought that it might be dynamited, but we contacted a contractor and he said you couldn't possibly blow it out with dynamite. It was just a puff and that's all it would do, just make a little hole in it.

Mr. Bishop:

[Mr. Anderson] indicated that on one previous occasion by private and special law, the department had attempted to remove a similar floating island from I think Lake Corundell or something like that. And the difficulties of doing this were discussed at some length. Apparently, it is a very difficult thing to remove and I think that when we attempt to correct things done by the forces of nature or even sometimes by the hand of man, we're going to undertake a tremendous expense for the state if we are going to assume the responsibility for all these things. There are many lakes where there is flooded areas with trees remaining, all kinds of things that would be nice to improve but I don't think that we can afford it.

The contractor who attempted to remove the other island felt that he lost money on the deal and after hearing all the difficulties that were encountered, in a moment of weakness for which I sincerely apologized, I asked Mr. Anderson if the intent was to load it with money and sink it, for which I apologize again, but that was my feeling. I hope that you will go along with the unanimous report "ought not to pass".

The vote was 63 to 48 to accept the "ought not to pass" recommendation and the State of Maine provided no funds for remediation.

As a follow-up to Lake Corundell for which the state did provide assistance, "Floating Islands in Corundell Lake Just a Memory," Daily Kennebec Journal, June 4, 1946, notes that the largest island was about two-acres.

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Maryland.

"Did the floating island float away?" asks the January 31, 2012 issue Waterblog. What's Happening at the National Aquarium, regarding the disappearance of the aquarium's floating island in Baltimore's Inner Harbor (right).



With the help of Baltimore City's Department of Public Works trash boat, the Fire Department's fire and rescue boat and volunteers hand pulling, it was moved for the winter to the Fort McHenry wetlands (lower right)



Massachusetts

"Runaway Island Gives State a New Problem," Worcester Evening Gazette, October 19, 1938 , describes the two vs. destroy choice regarding a floating island in Rocky Pond near Boylston.

Storm Tossed Three Acre Freak on Rocky Pond Shore, Northboro, and There She Lies

State authorities today took up the question of what to do about the runaway three-acre island which has moved in shore at Rocky Pond near the Northboro-Boylston line, smashing some piers and boats, and cutting off a summer cottage colony from the water. Charles J. O'Donnell, civil engineer from the Department of Public Works, arrived at the pond with instructions to make a survey to determine what might be done to remove the truant island and fix up the pond again.

Residents in the district and the owners of summer cottages, many of them residents of Worcester, Clinton and Marlboro, had various ideas of how to dispose of the bothersome runaway.

One suggested blowing it up with dynamite. Others suggested hitching a cable or two to the island and towing it back into its old position with winches placed on the far shore. A majority

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thought it would be a fine idea for the state to cut it up, drag it out of the water, and truck it away. One resident has already started to take matters into his own hands, cutting away several sections near his property and towing the pieces "out to sea."

The trouble with this procedure, O'Donnell cautioned, is that it may develop a flood condition if the "pieces" float along with the current to the dam at the northwest end of the 30 acre pond and block the overflow. The water is already at an unusually high level.

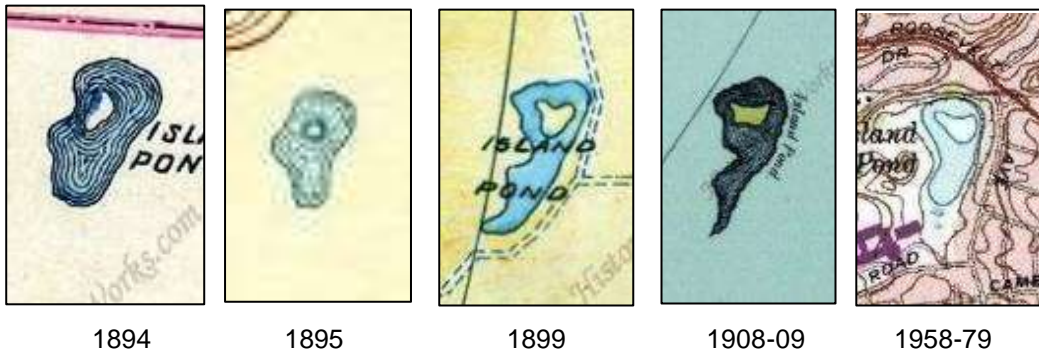
Incidentally, the state is owner of the island and there is therefore some doubt as to the authority an individual might or might not have to carve it, no matter what its present nuisance rating.

Reports of mobile floating islands tend to be historic, not contemporary. The accounts are often limited to newspaper archives, occasionally graced a grainy photograph. Island Pond, on the other hand, remains very much an ongoing saga. Its floating island is there for inspection.

Charles Barrows' An Historical Address Delivered before the Citizens of Springfield (1916) provides an early report.

The island formerly moved by the force of the wind and perhaps now is not firmly anchored. With dark woods around the shore and watersnakes in the pond it was an uncanny place in my boyhood. The woods are gone and the lupine now lines its shores in May, but the watersnakes remain.

On a year-to-year basis, not much may appear to be happening.



On a short-term basis, however, the island can be rambunctious. Having 3-meter birches, alders and pines as sails, the football-field-sized eponymous mass can scoot across the pond in as little as 20 minutes. Were Cathedral High School, the pond's owner, to install a web cam, following the island's travels would be as easy as monitoring the pandas in the National Zoo.



As for more-recent times,

"Mass Lexicon is Nearing Halfway Point in Long Journey," Union-News, March 9, 1993

The island was chained to a tree on the Cathedral High School soccer field several years ago.

"Island Appears in Neighbors' Yards," Union-News, August 23, 1994,

Theoretically, it might be fun to find an island in the back yard. In reality, Bill Lodi found one in his back yard, and he doesn't much like it. Nor is it the first time for him or some other residents who live on the shores of Island Pond.

"Rare Moving Island Creates New Beachfront," South Coast Today, May 27, 1998,

William Lodi saw it coming. His neighbor even dragged out the camcorder as a tree-covered island slowly and inexorably cruised across the pond to beach itself in Lodi's back yard.

"It comes down every year, but usually it doesn't stay long," Lodi said yesterday gazing into a tangle of mature trees and poison ivy where his beach used to be. "But it can be kind of a nuisance. Maybe, I'll turn it into a floating casino."

With roughly the dimensions of a football field, the island -- complete with nesting egrets, ducks, muskrats and a pair of tub-sized snapping turtles nicknamed Big Ben and Frankenstein -- has been cruising Island Pond for decades.

Actually, it's not an island at all, said Stan Tenerowicz, the city's wetland specialist. It's a rare nearly-acre sized mat of peat that over the years accumulated enough soil to support grasses, bushes and, finally, mature trees.

"It's not unique, but it is one of just a few in the country," said Tenerowicz. "Whenever we get heavy precipitation and a good, strong wind, it's on the move."

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For a few years it was tethered by cable to a pair of trees behind a Roman Catholic high school at one end of the lake, but city conservation commissioners, who have jurisdiction over the island -- classified as a protected wetland -- ordered it freed.

"We didn't want its uniqueness altered by being tethered," Tenerowicz said. "It's really pretty neat."

But enthusiasm for the wandering wetland tends to wane when it landlocks your boat dock, Lodi said. One resident at the south end of the lake ended up hosting the island for two years, he said.

The island, which Lodi estimated is less than five-feet thick given the depth of the water by his dock, tends to ground itself in the shallows on either the north or south end of the lake.

"It doesn't bother the guys in between," Lodi said. "They just wave as it passes."

Heavy rains earlier this month raised the water level so it floated free. A stiff northeast wind probably set it on the move, he said.

"And I'm hoping for a good thunderstorm to get it moving on out of here."

Lodi said it took the island about a half-hour to cover 1,000 feet.

The migration was enough to startle a pair of Canada geese, who suddenly found their island nest and nestlings were not where they had left them.

"The babies were chirping in the nest and the parents were flying around squawking until they located them," Lodi said.

"Floating Island to be Inspected," Union-News, August 30, 2000,

When city and state officials meet next week to discuss towing, they won't be talking about cars. Residents of the section of Roosevelt Avenue abutting Island Pond want the city to tow away a floating island nestled against their back yards. Mayor Michael J. Albano set up an on-site meeting with city and state conservation officials for Sept. 6 at 5 p.m. at the request of residents who say the water near their houses has become stagnant.

"City, School to Work on Floating Eyesore," Union-News, September 7, 2000,

The Conservation Commission and Cathedral High School will try to help property owners on Roosevelt Avenue deal with a problem that consists of a floating island, officials said at an outdoor meeting yesterday. The transient mass of muck, weeds, 80-foot white pine trees and wildlife that has formed over many years on Island Pond, located behind seven or eight homes on Roosevelt Avenue, has been causing headaches. It blocks views, floods back yards with bugs and blocks access to the pond.

"City Plans to Tow Floating Island," Union-News, October 20, 2000,

The city plans to tow a pesky floating island from one side of Island Pond in an effort to get the football-field-sized mass out of residential backyards. The towing will have to wait until the water level rises in spring, but William Lodi of 408 Roosevelt Ave., one of a number of concerned abutters, said he is happy he will not have to go through another summer with the view-blocking and unkempt mass in his back yard.

"Cathedral Students Clean Up Along Pond After Complaints," November 14, 2000,

Spurred by neighbors' complaints, Cathedral High School yesterday dispatched some 30 students to remove litter along the bank of Island Pond that borders the student parking lot. Administrators tapped the students after the mayor's office received complaints from Roosevelt Avenue residents whose backyards overlook the school-owned pond. Residents mainly objected to the location of the pond's famous floating island, which has stalled behind several homes.

Chapter 77 -- Tow It

"Tow Sought for Island that Floats," Union-News, April 5, 2001,

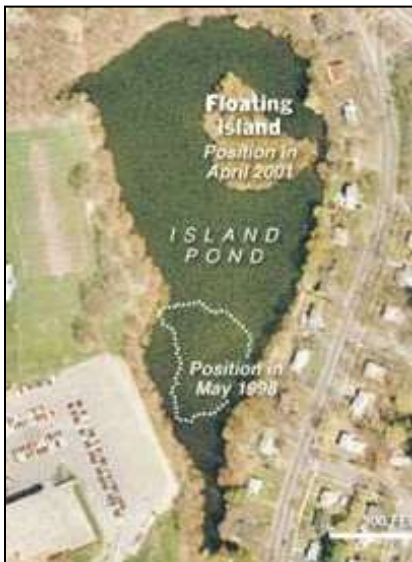
It's not blocking a fire hydrant, but several people believe that a tow is needed for a floating island at Island Pond before it establishes permanent roots. The mayor's office, the Conservation Commission, Cathedral High School officials, a wetlands scientist and a local towing company are working together to come to the rescue of the island, which became lodged in the shallow, southern end of the pond.

"Floating island Waits for a Tow," Union-News, April 8, 2001

If Mother Nature cooperates, CJ's Towing has a major job lined up Wednesday that will have a lot of people crossing their fingers years ago.

"Stray Island Towed Back into Pond," Union-News, April 12, 2001

Moving the floating island was a daylong job and, if it had been done for a fee, would have cost about \$10,000. Using two wreckers, each capable of pulling 40 tons, and a 12-man crew from CJ's Towing, a floating island was pulled from a narrow cove where it had lodged for almost two years and was in danger of taking root.



May 1998 and April 2001



Today

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"Backyard Vacation," Journal Gazette, October 22, 2005

A rare floating island in a pond in Springfield, Mass., broke free during last weekend's storm and was beached in a nearby backyard. The 10,000 square-foot land mass had been floating in Island Pond, but last week's heavy rains shifted the island "over my fence, crushing it, and onto my property," Andrew Renna said. "It remains impaled on the fence, roots out of the water," he said. The island last tore free in 2001.

"Neighbors Nudge Floating Island," Boston Globe, October 30, 2005, CJ's Towing again to the rescue.

This month, the 10,000-square-foot island settled on a different shore on Island Pond. Yesterday, Crimmins and others watched as workers once again hauled it to the middle of the pond. It took eight men using two cables capable of pulling 45 tons three hours to "re-float" the island.

William Lodi has lived on the edge of Island Pond for about 20 years and said he's seen the island get stuck a dozen or so times.

Every few years, according to neighbors, it crashes into someone's backyard, sometimes taking out a tree or fence.

"It's been all over," said Philip Cote, who has lived in the neighborhood for 44 years.

C.J. Morel, of CJ's Towing in Springfield, said his crew hooked straps around four of the island's biggest trees and attached them to cables. Then a truck on the opposite end of the pond pulled until the island came free.

A worker stationed on the island whooped when he felt the island move underneath him, as it sailed back to the center of the 10-acre pond.

The pond and island are owned by Cathedral High School, which paid about \$5,000 for the island to be towed.

"Aboard A Rowboat in Island Pond, Mass," New York Times, November 6, 2005

Sometimes it boings mischievously around as if the pond were a pinball machine, sailing, for example, into Richard and Beverly Vears' backyard just hours after they moved in. That gave a neighbor a perfect welcome gag: telling the Vearses he was a tax collector who would charge them for the extra property.

"And Sometimes, the Island Is Marooned on You," New York Times, November 6, 2005,

The eponymous island, about the size of a football field, made a beeline for Renna's house -- crushing his 3-foot chain-link fence, swamping his red, blue and purple flagstone patio, wrecking his dock, flooding his shed, hobbling his weeping willow and drowning the oregano, cilantro, tomatoes and peppers in his garden. Then it came to a standstill in Renna's backyard, an interloper squatting in stubborn silence.



"Normally when it floats, you can actually hear the roots rip -- it sounds like ripping up carpet," said Renna, 51, a roofing and siding sales manager. "But this time, it didn't make any noise."

The islands, which can be as big as an acre and 6 inches to 6 feet thick, are rich environments for wildlife, allowing small creatures to out-float predators. Many of the islands sprout trees,

which act as sails; the 20-foot birches, alders and pines on the Island Pond island can ferry it across the entire pond in as little as 20 minutes, residents say.

Michigan

From "Reeds Lake Island New to East Grand Rapids," MLive, April 13, 2011,

Reeds Lake in East Grand Rapids has a new island. Sometime during the stormy weather the night of April 12, a large piece of land broke away and floated onto Reeds Lake.

City officials estimated the island to be approximately one quarter to one half acre in size. Members of the Grand Rapids Yacht Club helped tow the island closer to shore where EGR Public Works Department employees could begin working to clear it away.

According to City Clerk Karen Brower, Michigan Department of Natural Resources and Environment, officers said once the piece broke away, vegetation would not continue to grow. So city workers are attempting to break up the island and haul the debris to yard waste facilities.

Pictured is a yacht club boat towing the island to the shore and Department of Public Works employee Kyle Anderson walking around on the mass to attach a grappling hook so they can rope it to shore and keep it from floating away again.



Minnesota

"Crews Remove Almost Football Field Size Bog on Lake Lizzie in Otter Tail County," WDAY 6 News, July 9, 2014,

Giant floating masses of weeds have been causing extra trouble in lakes country this year.

DNR officials say they haven't issued this many permits for relocation, or removal of bogs, in almost 10 years.



Crews removed an almost football field sized bog on Lake Lizzie in Otter Tail County.

It was one of the many in northwestern Minnesota knocked loose by high water and heavy winds.

"Every morning I get up about 5 and look out to see where the bog is, you know," says Tony Schreiner a Resident Threatened by Bog.

This floating island has visited Tony Schreiner's place four times now, he had to move his dock in to protect it after the mass knocked it out of place.

So after three weeks of dodging, a dozen residents of Lake Lizzie got together to slowly push it five miles to the public access.

"Pretty much they're dictated by the winds, where they go," says Kim Janecky of the Lake Lizzie Lake Association.

The things are a real hassle to get rid of, even with so many boats pushing it, it's only going about a mile per hour. But cabin owners say they have to be taken care of because if left alone they could seriously damage property."

These bogs can sometimes take days to get rid of; crews figured it'd take 10 hours to pull out the one at Lake Lizzie today.

New Jersey

James Prior, The Cedar Lake Story (1975),

The rising waters flooded certain lands deeded to Cedar Lake Park by William Clark and Vanderhoof. But as the lake level rose, it brought with it vegetation and growth. This mass of intertwined roots, earth, mud, and embryonic maples, birch and other trees, together with vines, brush and whatnot, congealed into clumps. Two portions of the major floating island broke loose during a late August 1948 storm and began floating around the lake, moving at about three miles an hour, then drifted toward the beach. James T. Gill, a New York banker on vacation at Cedar Lake, with the aid of about five others, lashed the island to the shore with ropes.



The next day Cedar Lakers used an outboard motor to haul the island away from the beach. A thick rope was tied to a large sapling on the first island and it was pulled back to the main island. Here it was secured with cable. Longtime Cedar Lakers recall it took nine gallons of gasoline in an outboard to pull one island back into position. The two errant isles took three days to be replaced adjacent to the mother island.

New York

Cranberry Lake near Arden is discussed in Chapter 33. Here we'll mention the attempts to tow it.

"Missing Links," Mountain Democrat, December 2, 1892, mentions a floating island which had to be anchored in place.

Floating islands are by no means rare, but an unusually queer one is located in Cranberry Lake, near Arden, New York. Some years ago, in order to keep the island from floating down the stream, it was attached to the mainland by a hawser, in nearly the same manner as an ocean steamer is tied to a dock. The old hawser still remains tied to a tree, and is the object of much interest to visitors.

"Cranberry Lake's Floating Island," New York Herald, August 28, 1893

When I returned to Mr. Davis' house I found him and his daughter, Mrs. George Budd, in an animated discussion as to whether people would believe the island ever moved. Mrs. Budd said that she had frequently told friends in New York about the floating island and they only laughed at her. She asked her father to take me down to the barn and show me the paraphernalia still in use to pull the island away from the dam during the spring freshets.

Mr. Davis [superintendent of the Harriman dairy farm] took me down to the barn, and in the loft he showed me a big set of blocks and tackle, such as one often notices in the rigging of a ship. The superintendent said, "We have had no occasion to use the blocks and tackle for several years now. I have been here for twenty-three years. The lake which you saw, Cranberry Lake, and the one above it, known as Forest Lake, were built by the old Parrott Blasting Company before I came to work at the mines. They were small natural lakes, but the building of dams

deepened and widened them to twice their original size. Mr. Parrott wanted to build his house on the island in Cranberry Lake, but even at that time it was regarded by the inhabitants as being in the possession of the devil or, at best, a very insecure piece of real estate.

Eight years ago [1886] the works stopped and Mr. Harriman bought all this property, containing the two mountain lakes and about ten thousand, five hundred acres of forest land. Since the blasting furnaces stopped the reservoirs have not been looked after so carefully because they are not of very much importance except as fishing kikes. The breaking of the dam of Cranberry Lake meant not only the destruction of the houses and lives of the mining population in the ravine, but the shutting down of the works for the want of water. The floating island was regarded as the greatest menace to the destruction of the dam. The entire population was once thrown into a panic about twelve years ago by the alarm given from Cranberry Lake that the floating island was slowly moving down toward the dam with the stubbornness of an avalanche.

A posse of men and horses was immediately dispatched to the lake with this identical block and tackle. That old hawser you saw fastened to a tree was used to connect the island with the gearing on the mainland. Then, with the assistance of several teams of strong draught horses, the island was pulled back gradually about a quarter of a mile from the dam. It was then tied up to the mainland, just as you would tie up a big ocean steamer to a North River dock.

"Want to Buy a Floating Island?" Syracuse Herald Journal, August 2, 1948, describes an instance near Syracuse.

Two Syracusans who own camps on Sandy Pond were presented with an unwelcome floating island by a windstorm last night.

Such a thing has never happened before on Sandy Pond, Prof. Whitney said this morning, as he learned his sandy beach is now covered with cattails from eight to 10 feet high. On other northern lakes, however, he said floating islands are not uncommon.

The island which moved last night took with it a 35-foot launch owned by Bohm, but damage to the boat is not expected to be great.

After conferring by phone with Dr. Paul C. Knapp of Fulton, who was at his camp when the island arrived, Prof. Whitney said efforts will be made to tow the island to an uninhabited shore. If that doesn't, work the campers will hope for a stiff offshore breeze.

The challenge of freeing a floating island from its roots in Lake Apopka is noted in "Mohammed Is Needed, But for Watery Job," Yonkers Herald Statesman, November 15, 1965.

Skin-divers are hoping to move a 100 by 100 foot floating island which, the divers report, is about to change its status and become rooted to the lake bottom.

If the island succeeds in becoming rooted, it threatens to block the entrance to a 110-foot spring cavern, a favorite practice and checkout diving spot for Brevard and Orange County divers. The workers expect to push the island back into the center of the lake.

Ohio

"Floating Isle Lake Mystery," Ogden Standard Examiner, September 14, 1934.

The Portage lakes district has no sea serpent, but it has a mystery island. The disappearing island, which had played peek-a-boo all summer, was cured of its wandering tactics by a group armed with motorboats, ropes and stakes.

Led by Walter Harris, state conservation officer, the contingent towed and pushed the huge mass almost the entire length of East reservoir. Then, in a shallow spot, between a large and small "permanent" island, they moored the newcomer fast.

There wasn't much time for investigation, as the island sunk out of sight again. A few hours later, it floated to the surface again. Residents began wondering what it was till about.

Setting out by boat, they found the mysterious sight was actually an island, some 50 feet long, 20 feet wide, seven feet thick.

Prof. Paul Acquarome, Akron University biologist and geologist, believes the island a piece of shoreline dislodged by some natural cause, sunk for many years, brought to the surface by an accumulation of marsh gas.

Vermont

Sadawga Lake is long known for its floating islands (Chapter 67).

"Sadawga's Floating Island Put in Chains," North Adams Transcript, October 5, 1951,

What to do with a sizeable chunk of floating island that was plugging up the waterfront of their summer home on the south shore of Lake Sadawga in Whitingham, Vt. .had Girardo Bolognani and his son, James, of Readsboro, Vt. scratching their heads for a time.

Most: people told them they couldn't move it. They would have to wait, for a good wind to blow it away from their property. But by using a chain leverage device, they moved it about 60 feet and in time they hope to anchor it to the main island from which it broke off last spring.

A November 1, 1951, follow-up

"Here we go again," said James Bolognani of Readsboro, Vt., yesterday when he saw his waterfront at Sadawga Lake cluttered with floating islands once more.

Mr. Bolognani said yesterday that the four cables tying the larger mass to the main island either snapped or pulled out of the sod during the brisk winds over the weekend. He plans to use the same method of attaching it to the main island, but intends to use stronger cables this time. He has the equipment all ready and is waiting for a favorable wind to help him get it to the main mass.

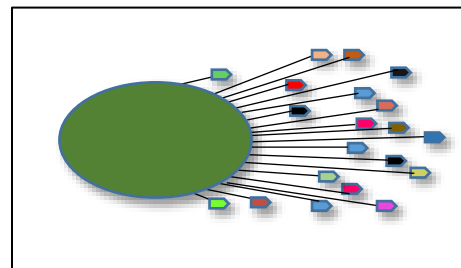
A "moving bee" mentioned in "Floating Island," Vermont Life, Summer 1952,

Some cottage owners were forced to lay plank walks across a large expanse of island and anchor their boats at the far end, or forego the pleasures of boating altogether.

Some attempted to blast the islands apart with dynamite, only to find that such a spongy mass was practically undamaged by such efforts.

As this story was being completed, the Bolognanis were toying with the idea of again moving the island out until it was free-floating, and then recruiting everyone on the lake having motorboats for what would be the most unique "moving bee" in history. The destination: the main island, to which the "wayward child" would be securely hitched by stout cables.

As the island was said to be a half-acre and we find in other sources that the fleet was 20 boats, we venture a layout of the "most unique 'moving bee' in history."



Many theories have been offered by "shoreline superintendents" as to how to cope with the Floating Island problem. Some have suggested throwing stout lines around the trees and towing the smaller islands to some out-of-the way spot at the head of the lake. Others have proposed dynamiting, and removing the mass piece by piece.

Using a "come-along" to relaunch the island. A breeze later blew it back.



Wisconsin

"Towing Proposed for Runaway Isle," Milwaukee Sentinel, May 17, 1956, begins our news clippings regarding Kettle Moraine Lake.

With one floating island already threatening to ruin resort property and another isle moving in, a plan was proposed Wednesday to haul the first runaway back out onto Kettle Moraine Lake.

Joseph Fahn, whose bathing beach and string of cottages are endangered, believed it would be possible to get 20 or 30 boats together, attach cables from them to the three-acre island now at the shoreline and tow it to open water.



After that, Fahn said, one or two things could be done, either break up the brush and tree covered island or anchor it at some remote spot on the lake by driving stakes and attaching lines to shore.

The boat harbor now has been blocked almost entirely by the island. If the lake level recedes, Fahn fears the Island will "take root" permanently wiping out the beach and cottage frontage.

Meanwhile Wednesday, the second smaller island had moved to within about a half-mile or the resort. Both Islands broke off from the west shoreline. The resort is on the south shore.

"Conservation Department Crews to Tackle Big Floating Island," Stevens Point Daily Journal, May 18, 1956, reports plans to tow the island, about the size of a city block, 6 or 7 feet thick, with 25 foot tall trees, out of the harbor

The task will be undertaken by attaching anchors to the island and then stringing cables from the anchors to the shore. Pulley engines will provide then pulling power

Sheboygan Press, May 21, 1956,

Tuesday, some dozen boats, equipped with powerful outboard motors, some pulling and some pushing, failed to dislodge the island. A strong wind hampered the operation. The island is actually a brush and tree-covered bog.

Tow-lines are attached to various sections of the island, and increased motor power will be used next Sunday in an attempt to tow it across the lake. Thousands of persons have visited the scene in the past week, and a record crowd is expected to be on hand Sunday for what might be the final tussle with the drifting island.

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"Operation 'Island Tow' Under Way," Milwaukee Sentinel, May 22, 1956,

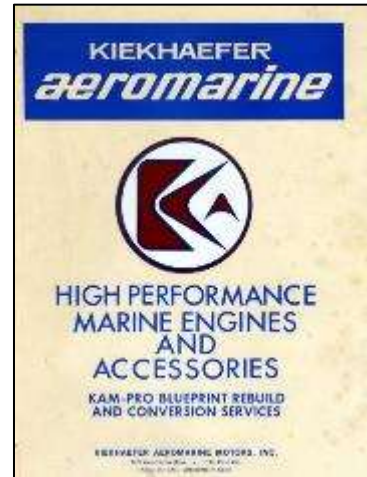
Cables were secured Monday to Kettle Moraine Lake's nationally famous floating island in preparation for operations on Tuesday which, it is hoped, will move the isle out from its resting place.

Large ropes were put into place by a crew headed by Buddy Boyle of the Kiekhaefer Aeromarine Motors Corp. of Fond du Lac.

Smaller lines will be attached Tuesday to the big cables in boats which will try to me island into open water to a spot where it can be dawn."

Kiekhaefer officials announced their outboard motor dealers from several cities were joining with the State Conservation Department in the venture as a public service to "meet the major challenge" which moving the island represents.

Boyle said between 15 and 25 boats with 40-horsepower motors would be employed in the operation. It is hoped that the backwash from the propellers will stir up enough water to jar the island loose.



Boyle continued: "This will be strictly an experiment for us. No one can say how it will turn out."

"Floating Island Visits Landsmen," North Tonawanda Evening News, May 24, 1956

Dundee's floating island rode safely at anchor today, but high winds kept residents from towing it away from their front yard.

The three-acre island, carrying four or five large trees, came visiting from the west shore of Kettle Moraine Lake. Residents turned out in motor boats Tuesday and dragged it off the beach. They moored it 15 feet from the shore, but a stiff 30-mile-per-hour wind stymied further efforts to get rid of the island. Further plans to tow the island somewhere else were postponed until Sunday.

"Floating Island Towed Into Center of Lake," North Tonawanda Evening News, May 24, 1956,

A fleet of motorboats huffed and puffed and managed to pull the floating island of Kettle Moraine into the middle of the lake Wednesday. The island was anchored in the lake's center. Eventually the boatmen hope to shove the three acre island aground somewhat along the west shore, where high winds broke it off last week.

"Lake's Floating Isle is Wandering Again," North Tonawanda Evening News, June 11, 1956,

The floating island of Kettle Moraine Lake was wandering again today. The three-acre island broke loose from shore and settled near a deserted shore. Residents feared it would travel some more and end up on their front lawn. The last time the island went wandering, a fleet of motorboats towed it away from a beach and shoved it up on the opposite shore. Many of the motorboat skippers said today they are in no mood to try to corral the floating island again.

"Restless Isle Again Blocks Fahn Resort," Sheboygan Press, June 25, 1956, reports that the island again broke free and the effort required to reign it in.

It took nine powerful motor boats and 2000 feet of towline to haul the wandering island back to its original point of departure where it was moored.

"State Rules Floating Isle to Stay Adrift," Buffalo Courier Express, July 4, 1956,

"Keep hands off that floating island in Kettle Moraine Lake." This recommendation has been sent by the conservation department's attorney, Emil Kaminsky, to Clyde Smith, superintendent of Kettle Moraine forest, and to others who might get involved with the island.

Kaminsky expressed his legal philosophy about the island, which has twice floated across the lake to bottle up a fleet of boats at Joe Fahn's resort near Dundee.

"It's land, wherever it lodges." he said, "and title to it, if it ever came to an argument, would have to be settled in court.

"However, nobody seems to want this floating island and it is being regarded as a common vagrant.

"All our men have been instructed not to touch it. Certainly the state is not claiming title to it. There is no legal precedent that we can find to match this situation. However, once, years ago, a floating bog like this one blocked off the dock of a state's rough fish camp and in sheer self-defense the state men staked it down."

Our cover art from Life Magazine, June 4, 1956, shows the towing scheme, though while the article indicates nine boats, the photograph shows six.

Then, about three weeks ago, the spongy mass slipped its moorings to again cross the lake, this time coming to rest on a sandbar about two blocks from the Fahn resort. Sunday, Fahn said today, a strong northwest wind again wafted the island down the throat of his harbor.

A month later, however, in Life Magazine, July 2, 1956, we regret to read,

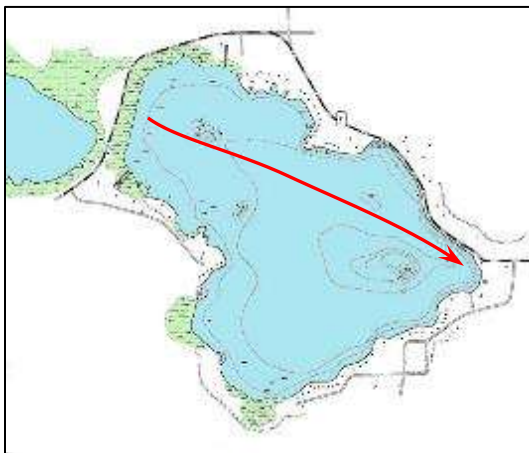
Sirs:

There is a very revolting development on Kellie Moraine Lake. That pesky floating island, which I had towed away from my resort and hogtied to another shore, has busted its tether and is on the loose again (A Look at the World's Week, Life, June 4). On the morning of June 8 a strong west wind came up. And the monster came pounding toward our place. For two days it lay in wait against the east shore, than moved closer. Now it's only two city blocks away.

Jos Fahn

Campbellsport, Wis.

So much for towing the isle of Kettle Moraine. We'll pick up on its more-spectacular demise in Chapter 77.



Path of Kettle Moraine Island



Today

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Another Wisconsin floating island is that of Lake Chetek, a.k.a. Prairie Lake. "Latest Grist from Eau Claire and Chippewa Fall's Favorite Summer Resort," Eau Claire Leader, August 23, 1905, refers to condition at the lake's southern end.

A big chunk of floating island blew in with the storm from "Ten Mile." After resting for a day or two between Red Lodge and the two Quale cottages, it blew back again almost on the same route, but this time Mr. and Mrs. E.H. Burnham were the lucky ones. Several couples tried hard to capture it with ropes and rowboats, but of no avail as it was as large as a ballroom and had a fine shade tree nourishing right in the center. After traveling a mile or more, slowly it lodged alongside of Burnham's boat house. Ed intends to coax it to remain and intends to drive a few stakes on the outside. Fish as a rule swarm beneath a floating island, especially in summer time. It is worth forty or fifty dollars to have a floating island attached to a summer resort. Burnham is on the right side of the lake for islands; let him anchor it at once.

To the right, a 1909 postcard.

From "Uncle Ray's Corner, A Floating Island," Buffalo NY Evening News July 12, 1927,

There is an island in the lake which is a queer affair. It floats! It has trees and grass and bushes on its surface, but does not stay in any special place. Sometimes it at one side of the lake, sometimes at the other. It drifts according to the wind. This floating island is more than 100 feet long, and at least 20 feet wide.



Lake Chetek is very deep. Perhaps that is why it has a floating island. There are other islands, however, that stay where they are and do not go gallivanting around.

We'll pick up the story in 1934, with "Floating Islands of Lake Chetek Are Moving Again," Milwaukee Journal, September 29 of that year.

The most lively of the 11 islands to be found on the Prairie Lake section of the Chetek chain is one about the size of a city block. It has been cruising along the west shore of the lake. At the present it is lodged near the cottage of Mrs. Arnold Block, 3014 N. Frederick Av., Milwaukee, but a strong southwest wind may send it scooting farther up the lake.

Frequent bubbling on the surface of Prairie Lake indicates there is a section of the lake bottom about to rise, and if the spot is watched, a mass of peat ranging from one to 10 feet square will eventually push its way above the water. These miniature islands are devoid of plant life unless they become entangled in hungry roots of the tamarack growing on the established bank where the small masses are soon worn apart by the waves and they largely settle.

Dense growths of tamarack and alders are to be found on nearly all the larger islands today, some of the trees growing over 40 feet. Down to the very water's edge are ferns, mosses, cat-tails, plants and cranberry bushes growing in wild profusion.

"Shifty Islands on Prairie Lake Run Wild," Herald-Times, October 12, 1972,

Islands are on the prowl in Prairie Lake -- ripping out docks, blocking views and worrying officials as they "run wild" on the whim of the wind and water.

One island has been a particular problem. It is a 2-1/2 acre chunk of alder and tamarack trees, along with the soil attached to their roots, which ranges up to five feet thick under its crown of leaves, painted with fall's red and orange.

But it is a beautiful floating menace. Floating islands have been seen on Prairie Lake and the five others in northwestern Wisconsin's Chetek chain of lakes area since the lakes were formed by damming the Cedar River 100 years ago.

Until last weekend, the 440-foot chunk of alder and tamarack was stuck on a sand bar, where it grounded three weeks ago. But winds shifted and Saturday afternoon the island slipped off the bar and glided another eighth of a mile, again grounding on a bar.

Saturday, Army reservists had tried, using three heavy duty boats equipped with 100 and 200 horsepower engines, to push the island off the sandbar into deeper water. From there they hoped to tow it to the upper end of the lake and anchor it.

If it continues to move downstream, it will come toward a narrows in the lake and could lodge against the shore, said Charles Kozel, assistant Eau Claire area director for the DNR.

"If it ever does, it will be there permanently. We'll never be able to move it out again," Kozel said.

Somebody owns the 2-1/2 acre island, said Kozel. "But nobody is claiming it. If you owned it and it was running wild, ripping out docks and causing damage, you probably wouldn't want to let it be known it was yours either."

After decades of losing docks and boats and having the mouth of Rice Creek blocked by the bog, in 2000, the residents hired S&R Towing company to cable it across the lake and tie it up at Veterans Park on the north end of Prairie Lake.



As admitted by tow truck operator Sever Rundhaug, "It's hard to say who's going to win this one," "Moving and Anchoring the Floating Island in Prairie Lake," Chetek Alert, May 4, 2000, provides the story, blow-by-blow.

On Friday morning, April 28, a crew from S&R Towing in Cameron, headed by owner Sever Rundhaug, began preparing the island for its move. They secured large I-beams at the back of the island and used over 3,000 feet of 3/4"- to 5/8"-inch cable to pull the "Prairie Lake bog" into position. But it wasn't a quick tow job.

Sever Rundhaug, owner of S&R Towing, believed he could use tow trucks and cables to pull the island into a new resting spot. Rundhaug put his ideas to the test this past weekend, and although it was slow going, he and his crew succeeded in moving the island.

A group of spectators gathered at Wolff's Den, directly across from the boat landing at Veterans Park, early on Friday to witness the operation. Not much happened between 7 a.m. and 9:30 a.m. While they waited for the bog to move, onlookers speculated about whether the island would move or not, the overall cost of the operation, and whether the bog was somehow rooted to the bottom of the lake. Then about 9:40 a.m., the crew from S & R tightened the winch, and the island inched toward Veterans Park. People watching from the shore compared their "line up" points to determine if the island had really moved.

For much of the morning on Friday, the most exciting thing to watch was the news helicopter from the Twin Cities' KARE-11 television. After several hours and very little movement, many

spectators left the scene and went on with their day. One man commented as he left, "Yeah, that was about as exciting as watching your hair grow."

At approximately 11:45 a.m., Pat Higgins, one of the Rice Creek property owners who spear-headed the moving effort, was optimistic. The island had moved about 20 yards, and there were no problems. Higgins said it would be an "all day affair" to move the bog into place.

It took more than the rest of the day Friday to finish the towing operation. The bulk of the moving occurred on Saturday, when the S & R crew again hooked onto the island and towed it toward Veterans Park. During the day on Saturday, the bog shifted, and the I-beams that began the move on the north side of the island rotated until they were on the south side.

According to Sever Rundhaug, on Sunday morning, the S & R crew reset the anchors on the island and began to tow again; however, this time some cables broke. "It was a slow process, and about Sunday at noon, I was a little hesitant," Rundhaug admitted.

On Tuesday morning, he and another S & R crew member were winding up the remainder of the cable at the Veterans Park boat landing, about 100 feet from the new location of the floating island. The bog is now anchored in place at Veterans Park in three spots using I-beams and trees.

"We got the point of the island into place on Sunday afternoon, and then swung the end around that night," Rundhaug said. "We put in some long hours. We had a crew of four guys all the time, and sometimes six or seven."

Rundhaug said he bid the project at \$5,000, which will be paid by Rice Creek property owners, with help from the Chetek Lakes Protection Association, Inc. In the end, the move cost a little more than he expected, but Rundhaug was satisfied with the final outcome.

"If I had it to do over again, I would have bid it a little higher," Rundhaug said. "But we did prove a point."



Blocking Rice Creek



Anchored at Veterans Memorial Park

A different floating island made the news in 2010. As reported by WEAU, August 5, and in the telling, it appears that there had been at least two before.

"It came from down the lake and was moving up behind that island," says John Bolenbaugh pointing from his pier on Prairie Lake. "It got over there and then it just kind of died because the wind changed direction."

Bolenbaugh says the floating island made its move a couple weeks ago, floating right on by and eventually settling in a bay a little way down the lake. It's actually the fourth floating island, or bog as they're sometimes called, that he's seen in his more than six decades on the lake.

But back to the island left anchored off Veterans Park, still 2.3 acres in size, and home to trees now 30 feet high and many spots that could be walked upon.

Chapter 77 -- Tow It

By 2011, two of the three cables holding the island had to ceased to work. Volunteers had just trimmed the island's trees to reduce its propensity to sail, but the remaining tether wasn't enough. The island moved 500 feet down lake.



S&R was again called upon. Returning the bog to Veterans Park was an all-day process, using the same process as that of 2000. Cables were strung across the top of the island and connected to beams which caught on the underside and the island was winched to shore with a *tow truck*.

"Our game plan today was we got 1500 feet of cable, which is enough to run three lines across it and then we have three hi beams, and we're gonna try and pull it over closer to Veterans Park and secure it there permanently, again," the S&R operator explained to WEAU TV.

But adding from experience, "It's hard to say who's going to win this one."



Again tethered to shore

Residents speculated trees on the island acted as a sail and caused it to break the old cables. "I think everyone is going to be more aware of this, if the trees had been cut down earlier, chances are it wouldn't be a problem, now we'll worry about keeping the trees off," a local informed a WQOW reporter.

"Massive Island Breaks Tether, Floats into Prairie Lake," WEAU.com, August 7, 2011,

A large floating island is causing trouble for some folks in Barron County.

The island broke loose from its tether early Sunday morning and floated thousands of feet into Prairie Lake.

Roger Kruse, who lives off Prairie Lake in Stanley Township, described the moment he realized the notorious island had gone rogue.

"It was a nightmare for me," Kruse said.

Another concerned neighbor, Don Dauffenbach, said two of the three cables holding the island to the shore of Veterans Park snapped months ago.

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"When the wind and rain came up yesterday, there wasn't much holding the island. And you can see today that cable had snapped," Dauffenbach said.

The men said the island has been a problem for decades.

In 2000, both of them said they helped tow it to Veterans Park from the mouth of Rice Creek because it was blocking boat traffic and compromising water quality.

Kruse said he fears the island could end up back in the same spot.

"It was a lot of work, a lot of money and that was a long time ago. Now it could be more costly," Kruse said.

"If it kept moving it could roll over docks and pontoons. If you're out late at night it could get hit so there's a safety issue there," Kruse said.

And the tribulation continues. "Floating Island Floating a Little Too Close to Shore for Comfort," WEAU, July 31, 2015,

A fascinating sight captures a lot of attention on a Barron County lake -- a floating island moving across the lake. But, unfortunately for some, it's moving a little too close for comfort.

"It came from down the lake and was moving up behind that island," says John Bolenbaugh pointing from his pier on . "It got over there and then it just kind of died because the wind changed direction."

Bolenbaugh says the floating island made its move a couple weeks ago, floating right on by and eventually settling in a bay a little way down the lake. It's actually the fourth floating island, or bog as they're sometimes called, that he's seen in his more than six decades on the lake. But, he says it's an intriguing island nonetheless.

"Thanks to the storm we had the other night, it moved back (in the bay) about 10 or 12 feet," Bolenbaugh says.

The island hasn't moved too much in the past week, but is still relatively close to a couple docks and a small bridge leaving some living on the lake more than a little leery.

"I'm glad it passed my place but I'm concerned for my neighbors down here because it's pushed right into their property. They had to, I think, actually saw some of the wood off of it to keep it from damaging their property," says Dave Martin.

The island isn't necessarily a new sight, 10 years ago landowners fed up with a much bigger bog, one two and a half acres long, hired a company to cable it across the lake and tie it up. That came after decades of losing docks and boats and having a creek blocked by the bog. But, even knowing the history, Bolenbaugh is still happy to have another infamous island.

"It's like anything else; tree could come down and hit my dock. But, this is part of the history of the Chetek chain and I think it's a wonderful thing. Although it does create problems for anybody living on the lake, but if you buy a place on the lake you kind of accept those problems," Bolenbaugh says.

According to the DNR's website, floating bogs are not exactly rare. It says state law allows floating bogs to be removed without a permit as long as no bottom material is removed.

The saga of the Rest Lake's 1-acre floating island begins with a push and ends at the dump. From "Island is Gone! One Man Pushes Away Floating Island of Rest Lake," [Ironwood Daily Globe](#), August 17, 1940,

The floating island of Rest Lake is on the loose again!

And if anyone should ask Henry Kuhnert, proprietor of the Northern Lights Hotel who found the island on his swimming beach, and resting against his dock early this week, it'll be all right if the island never comes back.

Chapter 77 -- Tow It

The island, a 600-foot long, 50-foot wide mass of vegetation and good sized trees, broke loose during a night early in the week and astonished guests and a horrified Mr. Kuhnert found it parked right in front of the resort in the morning. Mr. Kuhnert was deeply concerned. Despite the fact that the island was drawing large crowds to the hotel, the proprietor wanted it taken away.

So. Mr. Kuhnert called Madison and after expressing surprise at the happening, the recipients of the telephone call weren't sure what could be done. Other calls brought little in the way of promising results.

But yesterday, the island was moved, and one man did it.

Frank Zack, Chicago vacationist staying at the resort and somewhat interested in using the swim in, good-naturedly and humorously said:

"I'll move the island."

Zack got in a boat, but the nose of the boat against the island and pushed. The island moved a bit, the wind changed direction and the breeze blowing against the heavy foliage on the island started the mass of earth and vegetation across the lake. No one was more surprised than was Mr. Zack. Merrily the island moved along until it came to rest about a mile away in Donahue's Bay, its starting place.

The island again wandered in 1942; 1962 and 1964.

Far right, the island being pushed along the west bank in 1962.



The island was then cabled to Camp Jorn YMCA property on the lake's east bank..

The cables rusted through in 2006, however, and the formation broke loose, grounding on a sandbar and depriving state property of shoreline and lake access.

A fishing report from that year,



Picked up some smallies in 6 ft and wood. also got a couple eyes in 25 ft and rock missed a few hits on a jig and minnow over 30 ft and sand. slow weekend, but didn't put a ton of effort into finding fish. The floating island has also moved, watch out with a north wind that thing will be going over the dam. Crazy.

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As pushing the island home wouldn't likely solve the problem, the floating island was excavated in 2008 by Ed Trapp with state approval, and ignominiously hauled to the town dump.



Not all were pleased with the action, of course, per quotations from the "Hanson, DNR Criticized for Controversial Removal of 'Floating Island'," Lakeland Times, April 15, 2008.

John Hanson, Manitowish Waters board chairman,

The floating bog island has "been in a lot of different locations on Rest Lake over the years... That was the best darn fish habitat on the lake and one of the best fish habitats on the entire Chain. It was a thing of beauty and a unique natural feature."

Dennis Lipp, Camp Jorn executive director,

"In defense of what John [Hanson] was doing, it [the floating island] was being thought of as a public nuisance. As the stories were when that island was free to roam 35 years ago, it created quite a bit of damage. The possibility of that [damage] occurring again, I think, was quite real."

A property owner,

"There's gonna be a lot of upset people when they come up here this summer and find out that the floating island was removed. It was a floating aquatic paradise. The fishery was next to none. The wildlife that it attracted was unbelievable."

Tom Joseph, Rest Lake summer resident,

"It was a public resource ... It was the most unique natural feature we had on Rest Lake and now it's gone, it's a pile of mud. It's gone. It's not like it can be brought back. I feel that the town made a terrible decision."

A Yankee Tale from Maine

In "The Floating Island of Murdock's Pond," Bay State Monthly (1901), James Whittemore recalls an island formed from a mass of logs washed into a cranberry bog near Ellsworth.

Murdock's Pond is no longer famous except as figuring in a strange story, even now fading into the "they say" stage of legendary uncertainty.

And this is the story of the birth and travels of its floating island.

The year 1871 will long be remembered by the people who lived by Murdoch's Pond as the high-water year, and some of the marks, pointed out to this day, seem almost incredible. That was the year the Gugemunkchunk [possibly today's Narraguagus] went on a fearful rampage. It had been a winter of much and heavy snowfall and every ravine was drifted deeply.

The torrent as it poured out of the stream swept directly against the great mass of hidden logs. The water swirled and sucked into the streets of the muskrat city. It gullied and burrowed until there was a huge pit beneath the last [log] drive of the Gugemunkchunk. The waters roared and swelled and lifted until the great mass shivered and groaned and then like a colossal monster reluctantly arousing itself from a century sleep, with a tremendous crashing and tearing, it freed itself from its thousand fetters and, with a hardly perceptible motion, floated out into the pond.

Thus on a dark night in April A.D. 1871 came into existence the marvelous floating island of Murdock's Pond.

As far as can be ascertained, the first mortal eye to which this strange phenomenon was revealed was one of two big blue ones which bulged from the head of little Jeremiah Billings.

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"They's an island! An island right out in the cove; grewed last night. Come an' see it! oh, come an' see it!"

"April fool day's gone a-past an' you're the biggest fool at last," chanted Jerry's brother Bill.

Finally several of the boys agreed to go and Jerry led the way down to the shore.

"I don't see no island," said Bill.

Jerry was completely taken aback, for his vision had vanished; only a single log was to be seen floating about in the cove where he was sure he had seen a beautiful little island.

But Jerry was not all wrong. A strong wind was blowing at the time and the island had drifted out of sight and was at that moment behind a heavy growth of trees on the point, and moving down the pond.

And then the floating island came down and grounded on a sand bar just off Honeysuckle Farm.

But one beautiful afternoon late in July something happened. The island started on its wanderings again. It seceded from the Peabody holdings and gently but certainly drifted down the pond, summer house, hammocks and all. And as gently as it started, so gently it stopped almost a mile from its former anchorage.

Peabody... wanted the island back if possible. He tried the law but to no avail. There seemed to be no law to fit the case, so the village squire told him, at a cost of three dollars. Then B. Babbidge, who claimed to be the original owner of the island, having a claim for certain damage done his cranberry bog, appeared at Meadowbrook Farm and demanded his island or a satisfactory amount in cash, but Mr. Higgins refused to give up either.

Mr. Babbidge and Mr. Peabody got their heads together and plotted a scheme, nothing more nor less than to steal and make off with the island, if taking what they considered their lawful own was stealing. They enlisted the service of Cap'n Fogg and his son, old men of the sea.

One dark rainy night several boats stealthily approached the off-shore side of the island. A hawser was attached to a projecting stump and all hands formed a tandem and pulled and pulled, but the island would not budge.

A week later another attack was made with more elaborate preparations. A small windlass was set up on the island, a line carried to a kedge anchor and this time the conspirators had the satisfaction of feeling the island begin to move, and it soon floated clear.

But alas for the best laid plans. The wind which they had planned would carry the captured island back to its former mooring suddenly shifted and blew strongly down the pond. The whole force could not stay its progress, nor bring it to anchor. Slowly and majestically it sailed towards the outlet. Here it soon began to feel the current, and it moved faster and faster and glided into the considerable stream which connects Murdock's with Rocky Pond.

It might have gone farther, if it had not been for the stone bridge across the outlet. No mortal eye saw the catastrophe, but it must have been a grand sight as the mass swept against the bridge with a tremendous crash. For a time it dammed the stream until the force of the water pushed the island literally up on edge, then it fell asunder burying the structure of the bridge with logs, trees and general debris and smashing the summer house and other island "improvements" to atoms in the general wreck.

It cost the county of Hancock over one hundred dollars to clear the bridge and highway, and to this day strangers inquire as to the origin of the immense pile of decayed logs about the Rocky Brook Bridge.

"That's where the floatin' island come ashore," is the invariable reply of the native, but the inquirer is usually none the wiser.

Canada

"Floating Islands Once More," Classical Weekly, March 19, 1934), by Russel Geer, describes floating islands of reeds in Chemong Lake, formerly Mud Lake, following the construction of the Trent Canal in the 19th century, which raised the water level.

My colleague, Professor Herbert N. Couch, tells me of larger floating islands on Chemong Lake, one of the Kawartha Lakes near Peterborough, Ontario. These islands, some of them of several acres in size, covered with rushes and small trees, and inhabited chiefly by snakes, are usually kept fastened by a boom at one end of the lake. When they break loose, small steamers are employed to nose them back where they belong.

"Five-Acre Cattail Mat Disrupts Waterway, Threatens Dam," The Independent, November 24, 1998, mentions a five-acre floating island of cattails near Lock 15 of the system.

"Rice Lake Residents Wonder How to Corral Floating Island," Northumberland Today, July 21, 2011, likewise is about the Trent Canal.

In case of the surreal natural phenomenon of a floating island, call the Trent-Severn Waterway people.

That much Rice Lake-area resident John James knows. His more immediate problem is how one corrals an island and what one does with it.

Raised on Shearer's Point, James moved back to the area a year ago. Given his history, he considers himself something of a mid-lake watchdog (following the tradition set by his mom and her friend Helen Gagne, whom friends called the Snoop Sisters).

He looked out Monday morning and saw what he described as a behemoth in the middle of the lake -- a 25-by-35-ft. piece of land complete with growth five to six feet high.

"It looked static, but there was a stiff wind and I noticed it was drifting," James said.

"I went out in my 15-ft. aluminum boat with the 15-hp outboard and tried to push it along, as I have done with docks and smaller versions, like a tugboat in reverse -- and it wouldn't budge."

The Ganaraska Region Conservation Authority said the people at Trent-Severn Waterways would have jurisdiction over this situation, but calls to their contact person had not been returned by press time.

"Dangerous 'Islands' of Trent River," a May 2014 internet posting by John Downing, brings us up to date.

The height of the holiday weekend featured too many floating islands that had been smashed away from wetlands by the waves and were roaring down the Trent like it was a demolition derby.

Earlier, cottagers to one side dealt with a huge mass of shrubs, vegetation, moss, muck, reeds and tangled roots that took up more space than many cottages. Some put their boats in early just to try to shunt the sodden nightmare away from smashing too much of their docks.

Later we had a regular shuttle of several jet skis shepherding smaller islands around my point and to the far side of the narrows where they could do almost no damage. They worked at it for hours.

Damn, I said to neighbors over the first rum-and-coke and old cheese of the cottage year, there actually is a use for those annoying Sea-Dos.

The jet ski operators had a ball, roaring around like cowboys at the edge of the herd in a Western, shouting cheerily to each other, the feeling of crisis hanging around them as if they were battling Nature claw by claw. Good for them. They had fun, but more importantly, they were doing something useful for a change rather than just ruining the gentle ambience.

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Germany

When in 2012, a sudden 10-centimeter rise in the Reigsee, a lake near the Austrian border, dislodged the cables mooring the lake's 1000-square-meter, 15,000-ton floating island, the island's 60 trees served as sails and the landmass floated to block a popular bathing area. According to the River Master, drawing the island away was impossible.

For this purpose it is much too heavy. Maybe we should wait and see if it still drives by itself closer to shore. There is indeed no immediate danger.



He was correct regarding "much too heavy." As a point of comparison, we show a hospital ship of that displacement, the SS Hope.



Peru

A photo from Lake Titicaca.



CHAPTER 78

LOSE IT

As we all can attest, things simply become lost. It's a fact of life. This chapter concerns islands that aren't where last reported. Did they float away?

Islands can become "lost" for many reasons.

Volcanic islands can abruptly emerge, and even more abruptly blow themselves to oblivion.

Cays periodically form when sediment is driven onto reef platforms during storms. As the unconsolidated sediment is readily eroded by subsequent waves, the life of such formations is often short.

Schools of breaching fish can disturb the ocean surface in the same way that a wave meets the edge of a reef.

The white scum that floats away from the seasonal rising of palolo (*Eunice viridis*) worms has been mistaken for islands (Chapter 8).

As noted in Chapter 49, vegetative masses drifted from distant shores have many times been taken to be islands.

Optical illusion can play a role (Chapter 21)

Pumice rafts can persist at sea for months before breaking up (Chapter 30)

Throughout the Age of Discovery, longitude was difficult to ascertain.

Add to the above the mythology in which a landform is a metaphor for something not geological (Chapter 15) and we end up with an ocean of "floating island" myths.

We'll look for "lost islands" to see how often the lore toys with the hypothesis that the missing landform floated to a new, yet to be rediscovered, location.

The Classics

Of the half-dozen mythical islands noted in Chapter 1, most are described as "floating," if not by the original tellers, by those who later put the tales to paper.

Legends of the Pacific

As Chapter 4 covers somewhat more than a dozen floating islands of Pacific folklore, we needn't rehash the tales, but the verb describing the islands' travels is most often "float."

Folktales from the British Isles

Chapter 2 draws upon some half-dozen tales told around the hearth in which mysterious islands drift in and out of human vision.

St. Brendan and a half-dozen other canonized seafarers were the heroes of Chapter 3, and again we noted the propensity to associate "floating" with whatever it was that the saint discovered.

If we'd omitted the chapter at hand, we'd have found ours count leaning heavily toward the conclusion that as a group, "lost islands" tend to be "floating islands."

But we'll see fewer and fewer such associations as we move forward.

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Thule

Greek navigator Pytheas left Marseilles about 325 BC, sailed past Gibraltar and turned north to become the first classical writer to describe Britain. An island further north he called Thule.

Citing Pytheas, Strabo speaks of Thule as situated at the edge of the earth where the elements were believed to fuse into a bond that held the world together.

Pytheas... is this last writer who states that he travelled all over Britain on foot, and that the island is above 40,000 stadia in circumference. It is likewise he who describes Thule and other neighboring places, where, according to him, neither earth, water, nor air exist, separately, but a sort of concretion of all these, resembling marine sponge, in which the earth, the sea, and all things were suspended, thus forming, as it were, a link to unite the whole together. It can neither be travelled over nor sailed through. As for the substance, he affirms that he has beheld it with his own eyes; the rest, he reports on the authority of others.

Ptolemy added Thule to his map of the world in his Geographia (c. 100 AD). After the book was translated by Florentine scholars in the 1400s, Thule appeared as an island north of Britain well into the 17th century.

Carta Marina (1539) by Olaus Magnus, north west of the Orkney islands



If Pytheas did discover an island north of Britain, it was likely one of the Shetlands, the Faroes, Iceland or even the coast of Norway.

The Thule of literature has become an isle where distinction between day and night, hot and cold, life and death are confused. "The ultimate dim Thule" is Poe's "Dreamland" (1844).

But the closest association with floating is Strabo's "marine sponge."

Antillia



Map of Albino de Canepa, 1489. Antillia, with its Seven Cities. The smaller island of Roillo is to the left

According to legend, when the Muslims invaded the Iberia in 711, a group of bishops took their flocks and sailed out into the Atlantic where they found the island Antillia and established seven cities.

During the 15th century, the island was commonly placed in the middle of the Atlantic, halfway between Europe and Asia. The legend is inscribed in the 1507 map of Johannes Ruysch.

This island Antillia was once found by the Portuguese, but now when it is searched, cannot be found. People found here speak the Hispanic language, and are believed to have fled here in

face of a barbarian invasion of Hispania, in the time of King Roderic, the last to govern Hispania in the era of the Goths. There is one archbishop here and six other bishops, each of whom has his own city; and so it is called the island of seven cities. The people live here in the most Christian manner, replete with all the riches of this century.

The legend gave rise to the Spanish legends of the Seven Cities of Gold reputed by conquistadors. But did Antillia float to perhaps New Mexico? The Spanish don't go that far.

Hy Brasil

Ireland is fertile in mythical floating islands (Chapter 2), the legend of Hy Brasil being well known. The island was said to be hidden under dense Atlantic mists except for one day in seven years. Beneath the mists, however, the sun shines and the inhabitants have all they could want.

We'll return to the isle in Chapter 80.

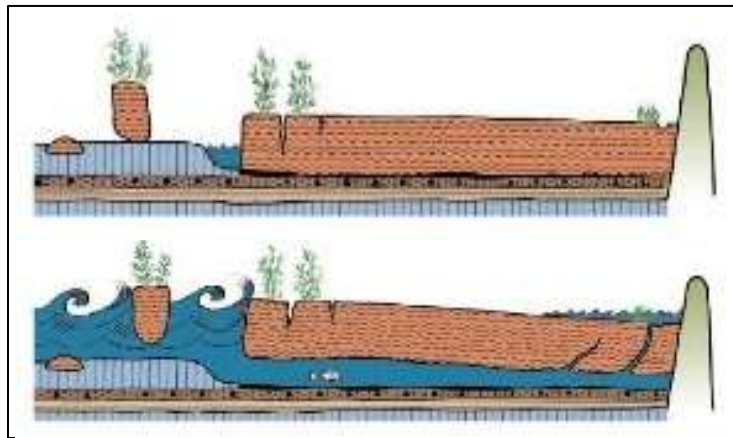


Ortelius' 1572 map of Ireland

Friesland

Reports of floating islands floated by storms along the coast of the North Sea date back to 1287

Friesland spans the modern Dutch/Belgian border to Saxony. Where subsurface seawater intrusion causes the peninsular bog to cracks horizontally, clay is deposited in the voids.



The combination of storms of the North Sea and the region's peat terrain has frequently resulted in parcels of land set adrift, and as a result, a long history of islands lost in one location and found elsewhere.



Pierre Bersuire's Repertorium Morale (c. 1350) cites the authority of the Chancellor of Paris regarding a floating island with people and houses seen in the sea off of Brabant, off what's today the Netherlands, carried there by the wind and remaining until the wind shifted.

Below, the 1558 Nicolo Zeno map said to have come from those who had navigated through the North Atlantic in about 1400. There is no such island -- or better said, if there once was, it's been lost.



The All Saints' Flood of 1570 occurred when a protracted storm overwhelmed dikes on the Friesland coast. Fatalities may have exceeded 20,000. Tens of thousands became homeless. The islands of Wulpen, Koezand, Cadzand and Stuivezand were permanently lost.

Jacobus and Commelinus Menso, in Poppius, Diluivm: Sive, de Horrendae Inundationis (1570), report that houses, a church and whole fields floated.



Pieces of peat moor were said to have floated tens of kilometers inland, where they became hills, a legend persisting for a century.

Johannes Petreus, Schrijien iiber Nordstrand (1597) suggests that trees buried in Friesland peat were due to drifting islands of peat covering forests.

Christianus Schotanus' Beschryvinge van de Heerlyckheydt van Frieslandt, tusschen t Flie end de Lauwers (1664) theorizes that such deposits had originally arrived as floating islands

In De Majoribus Oceani Insulis (1691), Johann Wulfer cites Ubbo Emmius' Rerum Friscarum Historiae (1596) regarding the force of waves in Marienchor near Dollard Bay.

Several large oak trees, together with other trees and some acres of land, and indeed a whole village situated at the western mouth of the Lauwers River, were carried away to a new spot, where the trees, unharmed, continued to grow for many years.

Friesland's rich lore of lost lands suggests that within the stories may lie kernels of truth.

Buss

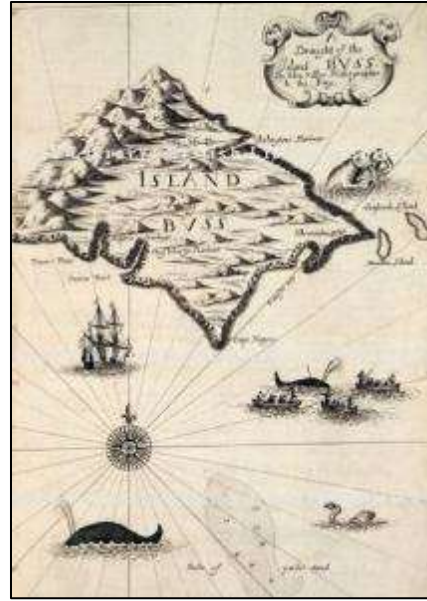
On Martin Frobisher's 1576 expedition to find a northwest passage from Europe to Asia, one of his ships sailed by an island described as "seeming to be fruitful, full of woods, and a champion countrie". The island was named Buss, after the class of ship.

It wasn't until 1671 that Thomas Shepard landed on the island, naming several places in honor of his Hudson Bay Company patrons.

"A Draught of the Island of Buss," The English Pilot (1671)

Shepard made a return voyage to find the island and couldn't, the common theory was that it must have sunk beneath the waves. By the middle of the 19th century cartographers had come to accept it didn't exist.

It is likely that Frobisher and Shepard saw different places, perhaps promontories of Greenland.



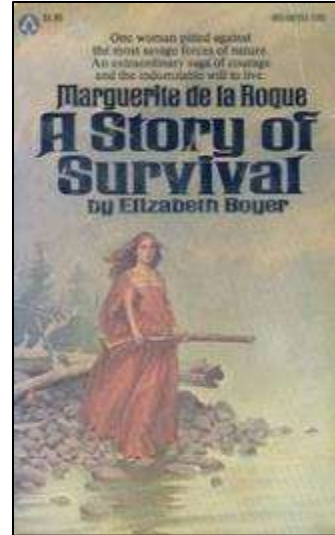
Isle of Demons

In 1542 Marguerite de La Rocque sailed with Jean-François de La Rocque, variously described as her husband, her uncle or even her cousin, to New France. En route she became pregnant by one of the sailors and, along with her lover and lady-in-waiting, was abandoned on the "Island of Demons."

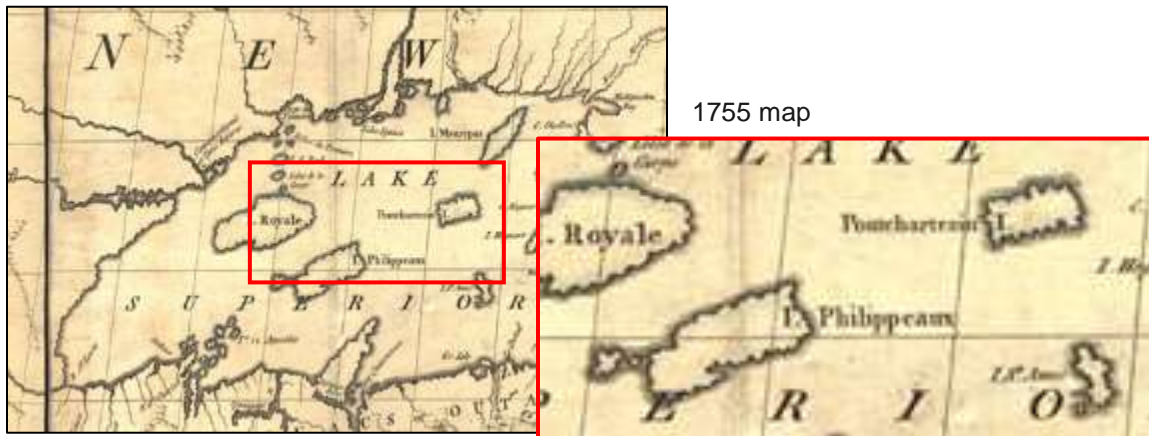
1565 map.



The lover, the servant and Marguerite's child soon died and for the next two years she wandered the island, constantly under attack from the devils that inhabited it. Eventually a Basque fisherman found her and brought her back to Europe where Queen Marguerite de Navarre turned her account into a popular romance. The novel didn't float the island, however.



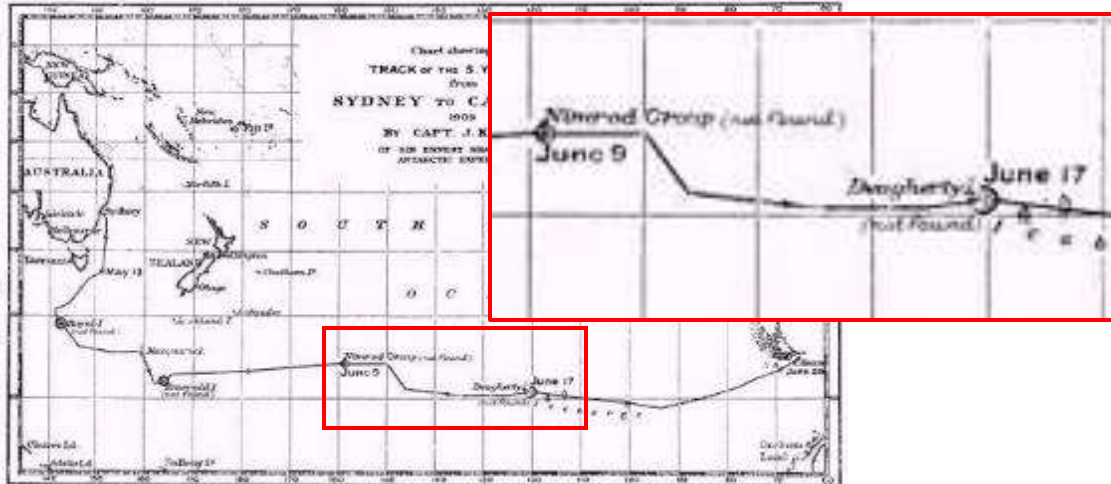
Phélypeaux and Pontchartrain



These islands were named after Louis Phélypeaux, Comte de Pontchartrain and Secretary of the French Navy. Their ownership was debated at the Treat of Paris in 1783, the decision being in favor of the United States, in retrospect, a gain of zero value. It wasn't until the 1820s that their non-existence was established. Apparently the islands were invented in the 1720s in hopes of flattering the Secretary.

Nimrod

By the late 18th century, the focus of exploration had shifted from the North Atlantic to the South Pacific. As the problem of recording longitude had been solved, any report of an uncharted island of sufficient size was taken seriously. The phantom Nimrod Islands were named after 1820s sighting by a ship of that name.



Map from "Voyage of the S.Y. Nimrod: Sydney to Monte Video," Geographical Journal 36:6, December 1910, by J.K. Davis

Despite not again being seen, eyes were peeled through the 1940s, a la "Nimrod Island Eludes Explorers," Spokane Daily Chronicle, December 26, 1946

Aboard USS Mount Olympus.

As far as this Antarctic expedition is concerned, the Nimrod Islands are missing.

The ships Yancey and Merrick reported today they covered an area for several miles in all directions from the reported position of the island group without seeing any land.

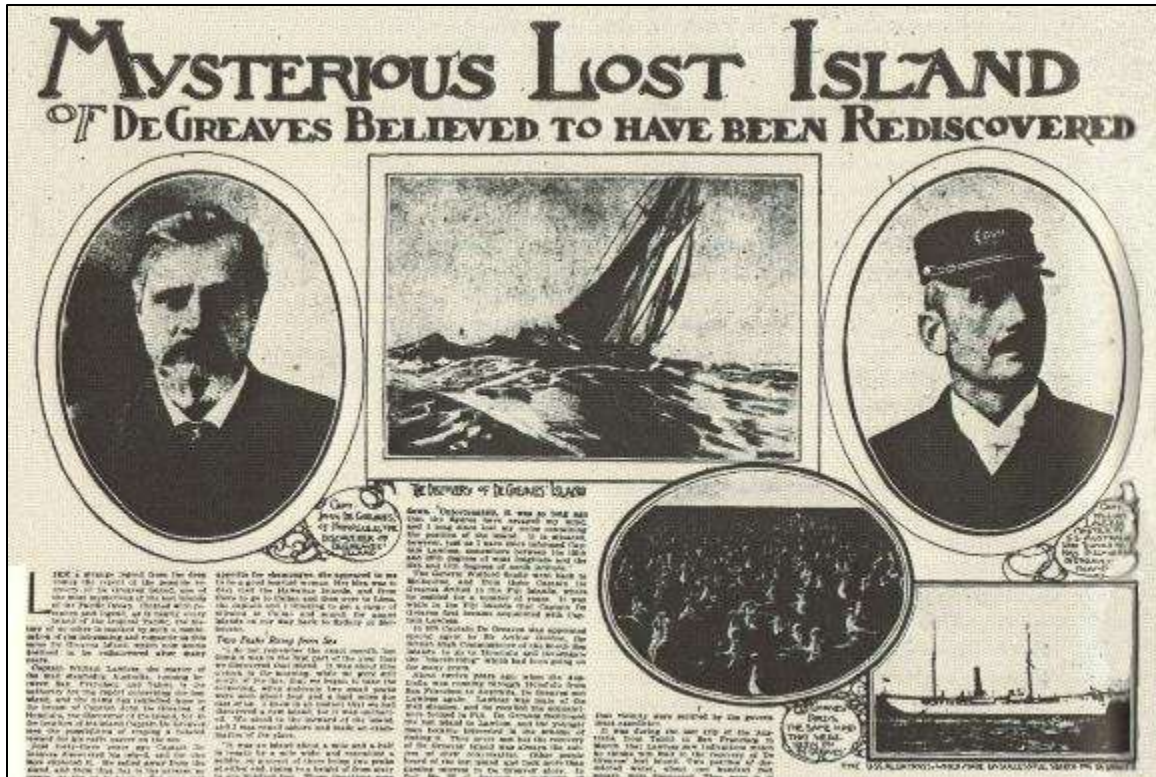
The Nimrods supposedly were sighted in 1828 at latitude 56-30 south, longitude 158-30 west by a Captain Eilbeck of the ship Nimrod.

Later explorers have suggested they may have been a mirage.

The American Group

Rumors swirled regarding the "American Group," an island about 2 miles long and 50 to 70 feet high, 1000 miles east of Hawaii. John Degreaves, adviser to King Kamehameha of Hawaii, claimed to have seen the island in 1859

Credence in Degreaves' discovery waned until a second sighting was reported by Capt. Robert Lawless of the mail ship Australia in "Mysterious Lost Island of Degreaves Believed to Have Been Rediscovered," New York Herald, May 4, 1902.



We quote from "Seeking Lost Island," Anaconda Standard, August 20 of that same year

Cruiser Sent Out to Find Land in the Pacific where a Wreck Occurred

Disaster Befell Naval Vessel Levant There Forty-four Years Ago, and Mariners Believe Survivors May Still Inhabit the Spot

The Levant was thought to have been lost in a cyclone in September 1860. A mast and a part of a lower yardarm believed to be from the vessel were found near Hilo in June of the next year, with spikes were driven into it as if a form a raft. A bottle was found off Nova Scotia containing a card, the legible parts of which included, "Pacific Ocean," "Levant," "Written by the last remaining," "three," "in a boat," and "God forgive us." But back to the clipping,

Seldom, if ever, has a United States war vessel been sent on a more romantic errand or one fraught with more thrilling possibilities than that which has fallen to the lot of the cruiser Tacoma. In response to orders from Washington, the Tacoma left Honolulu two weeks ago bound for an island out in the Pacific, the discovery of which was primarily due to the whim of a pretty dancing girl, and which has defied rediscovery ever since. The Tacoma's mission, however, is not one of exploration hut of rescue. It is thought there is a possibility of finding on the island some American naval officers and bluejackets who have been lost to the world for 44 years. So far no trace of the Island has been found.

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USS Levant



USS Tacoma

There is romance, in fact, connected with nearly every feature of the Tacoma's remarkable quest. The men whom it is hoped to rescue were of the United States sloop of war Levant, which in August, 1860, sailed from the Hawaiian port of Hilo never to be heard of again. She carried a crew of 150 men and was in charge of Commander C.H.S. Porter, one of the ablest seamen in the United States Navy and an officer who made a gallant record in the Mexican war. That the Navy Department, after a lapse of nearly half a century, has sent out an expedition in search of these men is owing to the tireless devotion of a friend of Commander Porter, now a resident of Honolulu, who never has lost hope that the commander may be alive and never has ceased to petition for a rescuing party.

The island upon, which it is hoped to find some survivors of the Levant's crew is known as Degreaves and is supposed to be somewhere between the one hundred and thirty-fifth and one hundred and thirty-seventh degrees of north latitude. It was discovered in 1859, the year before the loss of the Levant, by Captain Degreaves, who now is a leper in the colony of Molokai, Hawaii. Before the Tacoma left Honolulu in search of the island, Captain Degreaves was asked to relate the circumstances of its discovery,

He said that while in Melbourne in the year 1850, he shipped as mate on the schooner General Wolford, which had been chartered by Lola Montez, the famous dancer and singer, who had just completed a tour of the Australian cities. She was accompanied by her manager and the members of her suite and wished to make a pleasure trip to Hawaii before going to Lima, Peru.

"We were taking the reckoning about 3 o'clock one morning," said Captain Degreaves, "when suddenly two small peaks were seen about four and a half miles due east of us. I knew in an instant that we had discovered a new island, for it was uncharted. We stood to the leeward of the island and I was rowed ashore and made an examination of the place.

"The island was marvelously rich in guano. It seemed to be literally covered with the guano birds. You had to take a stick and knock them out of the way in order to avoid treading on them.

"On my return to the schooner, "Lola Montez and her party seemed delighted with the idea of having discovered an entirely new island in the Pacific and they went ashore and had luncheon. They made a big celebration out of the discovery and christened the place Degreaves island in honor of myself.

"The party caught fish and amused itself for two days, while I did considerable exploring. It is possible that I am mistaken about the size of the island and I am somewhat inclined to think it was larger than I have stated. During my stay there, I dug below the surface deposits of guano and found some valuable specimens of phosphates.

"The exact location of the island was taken. The weather was perfect while we were there and both the longitude and latitude were correctly measured and noted. Unfortunately I lost my notes and the discovery was made so long ago that the figures have escaped my mind,

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but I am sure the island is situated somewhere between the one hundred and thirty-fifth and one hundred and thirty-seventh degrees of west longitude and the sixteenth and seventeenth degrees of north latitude."

Irish actress Eliza Gilbert as better known as Lola Montez, "Spanish dancer." To the right, a caricature of Lola departing for America.



After his voyage on the General Wolford, Captain Degreaves, who is a native of the island of Jersey, lived for many years in the Fiji islands. In 1873 he went to Honolulu and remained a resident of that city until a few years ago when he was stricken with leprosy. He interested several capitalists in the island he had discovered, and expeditions were sent out from Honolulu and San Francisco to find it, but none was successful.

As recently as 1890 the United States hydrographic department became interested in the Island and at its instigation the United States steamer Albatross made a brief search for it. Soundings were taken along the one hundred and thirty-sixth degree of west longitude at intervals of about five miles. A depth of 2,764 to 3,083 fathoms was found and no traces of the island or indications of its existence were obtained.

In March, 1902, however, Captain William Lawless, master of the mail steamer Australia, running between San Francisco and Tahiti, saw two patches of discolored water, about 100 feet square, in 18 degrees 56 minutes north latitude, and 136 degrees 10 minutes west longitude. There was a big sea running at the time and Captain Lawless did not stop to investigate the spots, but he believes they were croppings from Degreaves Island.

"The Lost Levant, A Mystery of the Pacific," Magazine of History 7:1, January 1908, by William Abbatt, picks up on the story.

On careful inquiry and search of records, Degreaves' story was subsequently found to have been largely, if not wholly, invented for the occasion, presumably to stimulate renewed interest in further search for guano islands in that region.



1872 German Map



"Sovereignty and Mandate Boundary Lines of the Islands of the Pacific," National Geographic, December 1921

All in all, it's a great saga of the seas, but absent is any suggestion that the vanished island, complete with castaways, might have relocated elsewhere.

Falon

As reported in "Phenomenal Islands that Play Hide and Seek," San Francisco Call, April 28, 1901,

Since its first discovery in 1889. Falcon Island of the Tonga group, in the South Pacific, has played hide and-seek from its mysterious bed beneath the waves. With tantalizing regularity It has belied the ocean charts by surreptitiously swooping to its native deeps from the wondering ken of the puzzled mariner. It has been missing since 1898, and now it has emerged once more in the form of a huge whale. This unstable characteristic of Falcon Island is one of the family of peculiar phenomena which have been the fruitful core of many a ghostly ocean legend and the foundation of natural fact on which have been built interesting phases of the fairy lore of lake and sea. These Will-o'-the-Wisp bits of ocean land have caused discomfiture to the mariners of the sixteenth and seventeenth centuries and the location of numbers of vanished islands have place in all or most of the maps of those periods.

Crocker Land

In 1906, Robert Peary spied a landmass off Ellesmere Island in the Arctic which he named Crocker Land after a financial backer.

In 1913, an expedition from the American Museum of Natural History set out to find this Crocker Land. The local Inuits, however, knew of no such place, and frostbite and illness forced members to return to base camp. And things got worse. There was a likely murder. The team was stranded in the arctic for four years. Photographic record of Inuits is the expedition's only real achievement.



Although there were assertions that Peary was perpetrating a hoax, it seems more likely that he was deluded by a mirage.

Television's "Lost"

Turning the wheel in a chamber beneath Orchid station in the TV series Lost directs the 30 by 40-mile island's electromagnetic core to make the island disappear, leaving a vacuum that seawater quickly fills.

The island was in the South Pacific in 2004, and appears to have been in both the Mediterranean and off the coast of Africa at earlier points in time, but "floating" from A to B is clearly an oversimplification as to how this happens.



Conclusion

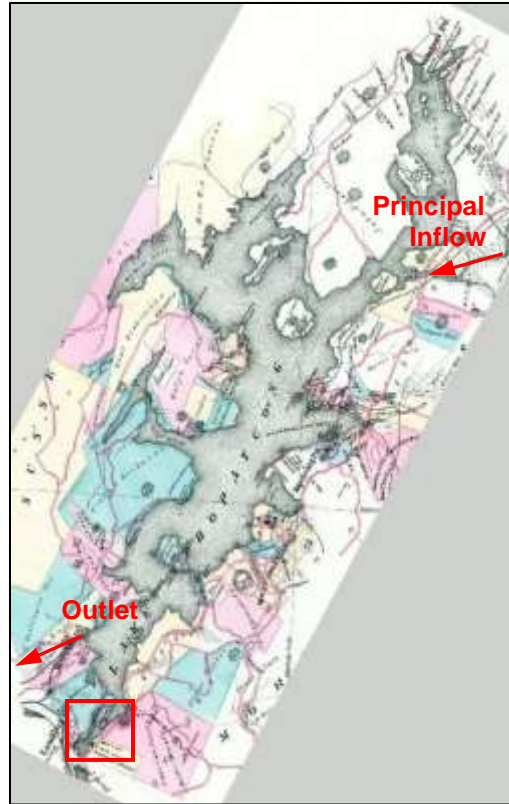
We've gathered multiple tales from folklore -- Classical, Pacific, Native American, the British Isles and elsewhere -- and almost without exception, an island that seemed to no longer be where it was supposed to roost was said to have floated elsewhere. The pre-scientific mind saw no mechanical problem in the matter.

Once we enter the Scientific Revolution, however, discovery calls for explanations not inconsistent with systematic principals, albeit ones not always well understood at the time. It's not that since the 15th century, islands aren't still occasionally "lost", but rather, as we have come to see, that the loss tends to be no longer ascribed to flotation.

CHAPTER 79 REPLACE IT

Chapter 78 deals with lost islands and Chapter 59 concerns environmental restoration. This chapter is about both, the case of Lake Hopatcong, New Jersey, where an historic natural floating island has been lost and an artificial floating wetland created.

Lake Hopatcong was created in the 1800s when two separate lakes were joined by a dam raising the level 6 feet. The modern 3.75-square-mile lake is 9.5 miles long, composed of numerous shallow coves around its 40-mile perimeter. Roughly 90 percent of the shore is developed, the majority as seasonal and year-round residences.



1887 map

Floating Island

The best way to become acquainted is through the eyes of those who viewed it in earlier days.

"The American Institute of Mining Engineers," Engineering, November 25, 1898

There is in this lake a floating island, which is about 1 ft. above the surface, and is covered with wild flowers, tamarack, and spruce.

Outings on the Lackawanna: Summer Excursion Routes and Rates (1899), Delaware, Lackawanna and Western Railroad Company, Passenger Department

Again boarding the steamer, we pass another freak of nature, Floating Island, which is about 150 x 300 feet in size, and covered with trees and curious plants. The island rises and falls with the water, keeping about one foot above the surface of the lake.

While we don't have a postcard showing the island, here's the excursion boat in 1903.



"Hints for Summer Contentment," Inland Printer 29 (1902) Maclean-Hunter Publishing Corporation

Floating Island with its flower covered shores lying tranquilly in the sunlight.

Lake Hopatcong Illustrated (1905), T.C. Whitlock

One of nature's phenomena is the floating island. It lies in the southern end of the lake. You will find it on the map and can easily locate it. It is of considerable extent, three-hundred feet long by one-hundred and fifty feet wide. A remarkable thing about this island is the small trees, many of them evergreens, which cover it thickly.

Scientists have tried in vain to solve the problem of this so-called floating lake. It does not move perceptibly except to rise and fall according to the condition of the lake.

"Jersey Hills and Pennsylvania Resorts," Brooklyn Daily Eagle, June 10, 1906

One of the very curious features of the lake is a floating island in the southern end. This island is 300 feet long and about 100 feet wide and is covered with small trees and small evergreen growths. This island, it is said, does not move horizontally but rises and falls as the surface of the lake rises or falls.

"Beauty Spots in New Jersey for the Man with the Motor Car," New York Herald, Sunday, September 1, 1907

Notable among the natural beauty spots which have helped to make Lake Hopatcong famous is Floating Island, which reaches only about one foot above the surface of the lake, no matter how high or how low the water may be. It possesses a most luxurious vegetation and from early in the spring until late in the fall presents the aspect of a veritable garden.

Illustration from the article



"Want a Change? Try the Foothills," Suburbanite, May 1912

Notable among Nature's beautiful gifts to Hopatcong is the flower-clad Floating Island, which always remains a foot above the water's surface (irrespective of the height of the water in the lake). It is covered with a luxuriant growth of flowers, its banks are lined with wild roses.

Recollections from the late 1940s by "Toes," from the LandingNewJersey.com website,

I increased the speed and did a fast circle around the stumps that were all around what we called the "floating island" that was in the center of the lake at that point. Supposedly it was a bit of land that broke loose from the big lake and floated to that point before it hit shallow water and rooted.

The Peats of New Jersey And Their Utilization (1943), Bulletin 55:B, Geologic Series, New Jersey Department of Conservation and Development, Selman Waksman, H. Schulhoff, C.A. Hickman, T.C. Cordon, S.C. Stevens

Characteristic profile of terminal moraine bog at Lake Hopatcong

<i>Depth (feet)</i>	<i>Physical description</i>
<i>0-2</i>	<i>Black, well-decomposed reed and sedge peat containing alluvial material and wood</i>
<i>2-15</i>	<i>Dark brown, fibrous and spongy reed and sedge peat</i>
<i>15-29</i>	<i>Olive-green colloidal peat and sedimentary peat</i>
<i>29--30</i>	<i>Gray sedimentary deposit</i>

From such records, we can draw a description of the floating feature: a well-defined root-tethered peat-based floating island, approximately 300 feet long and about half as wide, extending about a foot above the water surface, well vegetated to the point of having small trees,. That no commentary mentions visiting the island, we suspect that it wasn't structurally substantial. In visual aspect, however, the island was a notable sight.

All in all, Hopatcong's floating island was probably little different than a hundred similar features in peaty Northeastern lakes. Being on a rail line in a day when the railroads were promoting tourism, however, Hopatcong's island garnered a bit of extra publicity..

USGS topographical surveys, however, consistently showed the formation in the manner of a land-formed feature, if only of a spit of mud with bushes upon it, Floating Island is shown on every Lake Hopatcong map for over 150 years. Note, however, that its size seems to vary.



1887



1898

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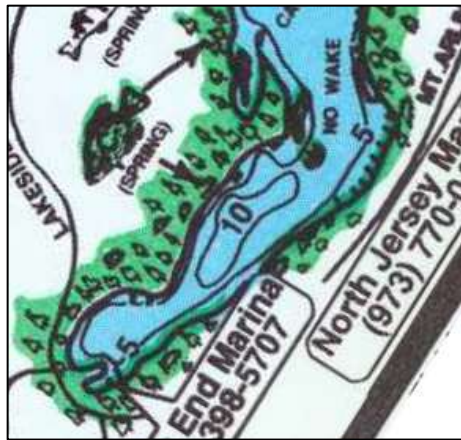
1903



1942



Current USGS mapping



Fishing guide, no island

Topographic maps may not be the best representations of change over time, however, as map-makers are prone to include features from older maps. The current topo, for example, shows the same housing as the 1942 edition. For an environmental time sequence, we've aerial photography.



1991



1995

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2002



2006



2007



2008



2010



2013

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Today's formation is more than twice as large as that reported historically, though as can be seen in the aerial photo, the enlargement seems to mostly be floating foliage. The darker central area likely represents the remnants of what was the more-definitive feature of a century past. Current publicity, the fishing guide being an example, makes no mention of a floating island.



Lake Hopatcong's "loss," as it were, of its floating island is not atypical of modern lakes. For the sake of an order-of-magnitude quantification, literature can identify, say, 1,000 historic floating islands with some degree of descriptive detail. Were our criteria simply being mentioned without unique comment, the count would be many-fold higher.

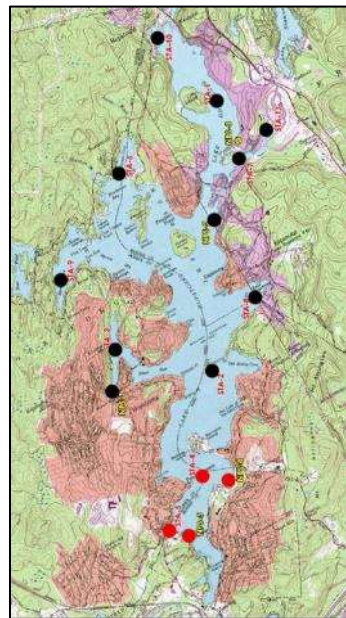
Today, however, the count of noteworthy floating islands is perhaps only a few hundred, Lake Hopatcong's removal from the turn-of-the-century touristic list is but one example of features once said to be, no longer being recognized. Floating islands can disintegrate, sink or be swept away. Others, like that of lake Hopatcong, may yet be with us, but visually obliterated by environmental change.

Whatever remains of Lake Hopatcong's once-remarkable attraction, "with its flower covered shores lying tranquilly in the sunlight" is enmeshed amidst a tangled mass of less-than-remarkable aquatic weeds, a consequence of the lake's deteriorated water quality.

Water Quality Monitoring

Residential development has increasingly jeopardized Lake Hopatcong's water quality. Algal blooms and the clogging of coves with aquatic weeds have become increasingly common. Water quality monitoring stations are indicated to the right.

As Lake Hopatcong is not homogeneous in water quality, we'll not endeavor to present an overall assessment. We'll focus on the four sites indicated in red, those nearest Floating Island, for the growing season, 2010-2012.



		mean	min	max
Water Depth	(m)	2.3	1.0	3.6
Secchi Disk Depth	(m)	1.6	0.8	3.1
Temperature	(°C)	22	17	28
pH		7.8	6.8	9.2
Dissolved Oxygen	(mg/L)	8.5	1.3	17.6
NH3-Nitrogen	(mg/L)	0.02	0.01	0.04
Suspended Solids	(mg/L)	3	1	14
Phosphorus	(mg/L)	0.02	0.01	0.04

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To measure of water clarity, a Secchi disk (an 8-inch disk with alternating black and white quadrants, lowered into the water of a lake until it can be no longer seen by the observer. Visibility at a submergence of 1 meter is considered acceptable for many recreational activities. While stations near Floating island surpasses this criterion, the water's clarity is visibly murky..

Dissolved Oxygen generally exceeds the 5 mg/L standard for fish habitat. The low value was observed near the bed when a portion of the water column was briefly thermally stratified, but the concentration was much higher just above.

NH3-Nitrogen concentrations are below 0.05 mg/L, a value tending to stimulate algal growth. Suspended solids are likewise at non-threatening levels.

The Plague of Phosphorus

The limiting nutrient in a biological process is the nutrient which, if first exhausted, will limit cellular growth. In a eutrophying waterbody, a slight increase in loading will unleash rapid growth of algal and/or aquatic plant biomass. One method to identify the limiting nutrient -- preferably in the lab, not the actual waterbody -- is to increase the concentration of that nutrient. If there is no biological acceleration, it is another nutrient that is limiting.

Lake Hopatcong Phosphorous Loading, 2006

Phosphorus is Hopatcong's limiting nutrient, A single kilogram of phosphorus has the potential to generate up to 1,100 kilogram of wet algae. New Jersey's phosphorous standard in freshwater lakes is 0.05 mg/L. Due to the sensitivity of Lake Hopatcong, however, the lake-specific threshold is 0.03 mg/L.

	Kg	Percent
Surface Runoff	2,466	31
Sparta Surface Runoff	138	2
Septic Systems	4,223	52
Atmospheric	68	1
Internal	595	7
Outlet of Lake Shawnee	607	7
Total	8,097	100

Based on an 8-years of lake-wide sampling, total phosphorous concentrations exceeded the 0.03 mg/L threshold 0 to 20 percent of the time in the mid-lake station and 50 to 100 percent of the time at the upper end.

Our four stations generally satisfy this target, but with little factor of safety. Whereas the southern end of the lake has to date escaped a crippling explosion of aquatic vegetation, inspection, albeit from above or the kayak-perspective to the right, suggests that the Floating Island area is at near-disaster conditions.



Phosphorous reduction requires multi-faceted management. We'll only discuss the in-lake methodologies, the two in bold face in the table below. The technical-sounding treatments are upgrades for wastewater treatment.

Phosphorus Removal Targets (kg/year)

Annual Total Phosphorous	8,097
Target	4,800
Required Reduction	3,297
Source	
Partial Sewering	615
Non-P Fertilizers for Residential Lawns	199
Pump-outs of Existing Septic Systems	52
Treatment	
Nutrient Separating Baffle Boxes ;	30
Nutrient Separating Baffle Box, Wetland Stormwater Basin	15
Aqua-Swirl/Aqua-Filter MTDs, Aqua-Filter MTD, Filterra	7
Peat Bio-filter Retrofit	5
Bio-retention System	1
In-Lake	
Mechanical Harvesting)	162
Floating Wetland Islands	9
Subtotal	1,095
Yet to be Removed	2,202

Mechanical Harvesting

Chapter 82 discusses mechanical removal aquatic vegetation in general. Lake Hopatcong provides a case study.



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When first employed, biomass harvesting removed up to 8 percent of the phosphorous target. Recent years, however, have achieved a meager 0.2 or 0.3 percent. The 162-kilogram target appears to be no longer achievable.

	Wet Mass (cu yd)	P (kg)
2010	20,420	197
2011	1,230	12
2012	1,980	19
2013	2,300	11

Equipment and fuel costs are high. The labor is arduous. There is noise and atmospheric pollution. Landfilled cuttings can leach back into the lake. Hacking away at small corners of the problem is a

Selective harvesting can appear effective on the small scale, however. The dock-owners of the cove illustrated below appreciated the short-term respite afforded by a weed-harvester.



Before and after harvesting

Floating Wetland Islands

In 2006, an alarming growth algae and muck was noted in Ashley Cove, a three acre section of northern Lake Hopatcong. Two "floating wetland islands" -- the "floating treatment wetlands" of Chapter 59, renamed -- each covering 250 square feet, were installed in July, 2014



Hopatcong's floating wetland islands are constructed of woven, recycled plastic material planted with indigenous sweet-scented Joe-Pye weed, Hibiscus moscheutos, common rush, New England aster, broadleaf arrowhead, great blue lobelia, and golden zizia in mulched perforations.

One 250-square-foot island has a bio-active surface area equivalent to approximately one acre of natural wetland and is expected to remove about 4 kilograms of phosphorous annually, a small number when compared to the phosphorous targets tabled earlier.

To reduce nutrient return to the lake, growth above the root system must be harvested after two to three growing seasons. The islands will likely need to be replaced in 15 years.

Floating wetland island islands are said to be to be cost-effective for waters with total phosphorus above 0.10 mg/L. If so, implementation in Lake Hopatcong isn't optimal.

Floating wetlands can generate an environmental bonus, however. eliciting interest and voluntarism, and as such, keep the challenge in the public eye.

Conclusion

Lake Hopatcong's floating islands span an era of enthusiastic description, a transformation of land use and associated consequences, and now a push for reclamation. Once a pollutant is in the lake, however, what can be remedied is miniscule compared to what can be prevented by preventing it from entering the waterbody.

Lake Hopatcong's story would be incomplete without reference to floating islands.

CHAPTER 80

GREET THE LOCALS WITH "DIA DUIT," NOT "OLÁ"

We're in Hy-Brasil, not the other Brazil, and here they speak Irish, not Portuguese.

As we know from Chapter 2, the British Isles are said to include of mysterious floating islands, and Ireland's best-known such outpost is Hy-Brasil, a.k.a. "O Brasil" or just "Brasil," in any variety of spellings.

In the epic literature of Ireland -- dating as far back as the 6th century, but probably not written until the 12th -- there are various stories of lost islands. We will only cite sources explicitly about Hy-Brasil, whatever the spelling.

The Lore

Folklore can move islands more effectively than does buoyancy. As to why Hy-Brasil floats, the old tales say little, but the island's history of being first here and then there makes evident that it does.

We begin with a quote from Melius Inquirendum (1629) by Vincent Alsop.

Strange it is, that Religion of all things in the World should be unfix'd, and like Delos, or O-Brazile, float up and down in in various and uncertain Conjectures:

Walter Scaife's "Brazil, as a Geographical Appellation," Modern Language Notes 4 (1890) outlines the scope of our quest.

On various maps it [the Isle of Brasil] may be seen designating a great Antarctic continent, extending to the South Pole, or a small island near the arctic circle; or it may be as far west as the southern part of South America or as far east as the vicinity of the coast of Ireland

We will indeed chase the island through much of the North Atlantic, but as observed by Barbara Freitag in Hy Brasil: The Metamorphosis of an Island from Cartographic Error to Celtic Elysium (2013),

Because of the numerous locations in which islands of that name crop up, it is often commented that Brasil Island was constantly straying about the Atlantic Ocean, shifting here and there in unconvincing if persistent fashion, but that it always wandered back to Ireland.

I.T. Galwey, Hybrasil and Other Verses (1872),

The Islands of Hybrasil have, like Hesperus, been celebrated from ancient times as the abode of immortal bliss, and to these legends Irish saintly lore has given a deeper and more sacred character. They are still sometimes visible in the shadowy regions of Cloudland, from the Northern and Western coasts of Ireland, especially in fine spring weather.

Fridtjof Nansen, In Northern Mists (1911),

The Irish myth of Hy Breasail, or Bresail, the island out in the Atlantic, is evidently very ancient; the island is one of the many happy lands like "Tir Tairngiri" (the promised land). In the opinion of Moltke Moe and Alf Torp the name may come from the Irish "bress" (good fortune, prosperity), and would thus be absolutely the same as the Insulae Fortunatae. The Italians may

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easily have become acquainted with this myth through the Irish monasteries in North Italy, unless, indeed, they had it through their sailors, and in this way the island came upon the map.

In The Voyage of Bran, Son of Febail, set in the 7th of 8th century, the hero travels to an island paradise supported on golden pillars in the Western Sea where no one is distraught or diseased. The isle is shrouded in mist and cloud, but every seven years the clouds part and the island becomes visible.

*A beauty of a wondrous land,
Whose aspects are lovely,
Whose view is a fair country,
Incomparable is its haze.*

Foggy mist, as we note in Chapter 21, is a nod to illusion, but few illusions persist for a millennium.

A Chorographical Description of West Or H-Iar Connaught (1684) by Roderic O'Flaherty

From the Isles of Aran and the west continent often appears visible that enchanted island called O'Brasil, and in Irish Beg-ara, or the Lesser Aran, set down in cards of navigation. Whether it be real and firm land kept hidden by special ordinance of God, as the terrestrial paradise, or else some illusion of airy clouds appearing on the surface of the sea, or the craft of evil spirits, is more than our judgments can sound out.

"This Vindication of the Ancient History of Ireland," Collectanea de Rebus Hibernicus 2:14 (1786) Charles Vallancey, relates this island to Plato's Atlantis (Chapter 75).

To this let us add the tradition of the old Irish: They say, great part of this island was swallowed by the sea, and that the sunken part often rises, and is to be seen on the horizon frequently from the northern coast. On the northeast of the island, this part so appearing is called Tir-Hudi or the Country of Hud; that it contains a city which once possessed all the riches of the world, the key of which lies buried under some Druidical monument. This is evidently the lost city of Arabian story, visited by their fabulous Prophet Hud.

On the N.E. of Ireland this resurging part of the island is called O Breasal, and corruptedly, O Brazil. The Scythian name of the famed Atlantes, literally turned by the Greeks into Basilea and O Stricta, signifying the Royal Island of the Gods., a name probably introduced by the Dadanites of Chaldea, with whom the ancestors of the Irish mixed,

From The Lost Atlantis and Other Ethnographic Studies (1892) by David Wilson,

An imaginary island of Brasil that flitted about the maps of the fourteenth and fifteenth centuries with ever-varying site and proportion, till it vanished. It was not a reef or a shoal, but a mist or mirage "sprung from the sea without root," but it held its place on the charts from 1320 to 1865, and was said to have been seen at close quarters in 1791.

The English, as history reminds us, are prone to park themselves on Irish lands. Kings included, it seems. García de Salazar's Bienandanzas e Fortunas (15th century) reworks the 13th-century Post-Vulgate Roman du Graal version of King Arthur's death.

And it is said about this King Arthur, and the English now still say it, that Morgain, his sister, took him to the Island of Brasil, which is 25 leagues off Cape Longaneas, which is in Ireland, and that she enchanted that island so that no ship can find it, for she was very knowledgeable about enchantments... There is no doubt that this island is there and that it is enchanted, for all the mariners find it on the charts that they use to guide themselves and sail the seas, which were made at the beginning of the world, much before this.

And the English say that that island can be found if the ship can see the island before the island the ship, for a vessel from Bristol found it one dawn and, not knowing that it was it, took on there much wood for firewood, which was all of brazil, took it to their owner and, recognizing it,

he became very rich. He and others went in search of it and they could not find it. And sometimes ships saw it but due to a storm could not reach it. And it is round and small and flat.

May His Majesty rest in peace.

The Quests

To honor the resting place of a king would be cause to return, of course, but to pursuit of the codfish was more-compelling. A contemporary account by Willelmus Boroner (William of Worcester) records that under the command of Thomas Lyde of "the most expert seaman in all of England," an expedition sailed from Bristol in 1480 in search of the "insulam de Brasylie" for exactly that purpose.

According to William Wyrcestre Redivivus (1823),

On 15th July 1480, the ship of John Jay the younger, of 800 tons, and another began their voyage from Kings Road (in the Bristol Channel) to the island of Brasil, to the west of Ireland. Th. Lyd was the pilot, the most scientific manner of all England, and news came to Bristol on Monday, September 18th, 1481, that the said ships sailed about the sea during nine weeks and did not find the island, but being driven by tempests, returned to a port on the coast of Ireland for the repose of themselves and their mariners

According to Spanish diplomat Pedro de Ayala, John Cabot partook a similar expedition in 1498,

"For the last seven years the people of Bristol and equipped two, three or four caravels to go in search of the Island pf Brasil." and that Cabot told him he made his journey to and from North America with "the men from Bristol who found Brasil."

A 1648 account from Boullage Le Gouz notes that "three miles distant from his ship he saw the phantom island, with trees and cattle."

James Hardiman's Irish Minstrelsy, or Bardic Remains of Ireland, etc. (1831) quotes from a manuscript "History of Ireland," in the library of the Royal Irish Academy, written about 1636

[An] island, which lyeth far at sea, on the west of Connaught, and sometimes is perceived by the inhabitants of the Oules and Iris... and from Saint Helen Head. likewise several sea men have discovered it... one of whom, named Captain Rich, who lives about Dublin, of late years had a view of the land, and was so near that he discovered a harbor... but could never make to land because of a mist which fell upon him... Also in many old maps... you still find it by the name of O'Brasile under the longitude of 3^o 00', and the latitude of 50^o 20'

But, the most complete account of this fanciful island is to be found in a letter from a gentleman in Derry to his friend in England, printed in London in the year 1675. The narrative is so curious, and the pamphlet in which it appeared so scarce, that I am induced to lay it entire before the reader. To those possessing strong imaginative powers, it presents an ample field for romantic fiction.

The letter to which Hardiman refers is O'Brazile, or the Incharnted Island (1675), by William Hamilton, pseudonym for satirist Richard Head. The writer explains that at first he looked upon O'Brazil as "a perfect romance" and scorned the "old probable stories of its enchantment." However, he has since become persuaded that one Captain John Nisbet had reached the island.

There is one Captain John Nisbet, who lived formerly at Lisneskey, in the county of Fermanagh... And in September last he fraught out a vessel of about 70 tons, laden with butter, tallow, and hides for France, which was to bring back French wines, which vessel being returning, and near the coasts of Ireland (as they thought) upon the 2d of this instant, March, 1674, after a most clear and frosty night, in the morning, about the time of sun rising, of a sudden, there fell a most terrible thick mist of fog, upon the sea, round about them, which continued the space of about three hours, and then cleared up again, very bright. But when the mist was vanished, they found themselves upon a certain coast, close by the shore, and of a sudden also, a very high wind, driving them still nearer to the land.



When the master and the rest with him... saw themselves so near an unknown shore, and could not imagine what place it should be, for though they knew most of the shores of Ireland and Scotland, yet they could not possibly give any guess where they were... They thought it was the best course to strike sails and drop an anchor (which accordingly they did), until they might inform themselves where they were.

As soon as the sun was risen, they saw a very ancient grave gentleman, and ten men following him bareheaded (as if his servants) coming towards the shore, where the ship lay, and being come close to the water side, the old gentleman calling to the master (in the old Scotch language), who, with the rest stood upon the deck, asked him, from whence they came? whither they were bound? and with what they were laden?

The old gentleman embraced them one by one; telling them, they were the most happy sight that island had seen some hundred years; that this land was called O'Brazile; that his ancestors were sometimes princes of it,

[The island] is above sixty miles in length, and above thirty in breadth, abounding with horses, cows, sheep, stags, rabbits, but no swine, and all sorts of fowls, and rich mines of silver and gold, but few people, and little or no corn; there have been cities and great towns, but all consumed.

The letter states that a cousin, Mathew Calhoon, has petitioned Charles I for a patent of ownership, as the "island had been fully discovered... and the enchantment broken." Legal basis for his claim to is understandably not clear.

Likewise attributed to Head is The Western Wonder or O'Brazeel, an Enchanted Island Discovered (1674), which presents different accounts of the appearance and disappearance of the mysterious island.

I cannot let pass what I heard from several of these discoverers, who told me, they saw this Island (no blue cloud, as I would have persuaded them to believe, but a long tract of firm land) whereupon they bore up to it; yet notwithstanding they made all the sail they could, in ten hours sail they seem'd to be farther from it, than when first it appeared to their view.

Another told me that he saw it, and thereupon made up to it (hoping to be greater than ever that great Usurper Trinkelo, or at least be Viceroy of this enchanted Island.) The sky was serene, the sea smooth, and hardly a breeze of wind stirring, when he made this attempt, and therefore was extremely troubled he could make no better way. Whil'st he was thus perplexing himself, the island seem'd to float unto him with such celerity, that in a little time he could discover rocks, trees, and men of a prodigious stature, who as they mov'd, look'd like walking oaks, whose shaggy bushy hair outvy'd the spreading of their leav'd branchy tops; and the waving of their hands, resembled much the turning of our wind-mills sails... He was immediately

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encompassed with a mist so thick, he could not see his hand before him; yet could he see on the sides of the vessel, the masts and yards, innumerable small lights, which shifted their stations, and interchanged one with another, at length they all incorporated together, whence proceeded a great and unusual slash of lightning, attended with dreadful claps of thunder; after which, the air grew clear, and serene again, but could not discover the least mark of what he had seen before.

The last report I shall give you, is thus: A vessel being bound for the westward, and coming under the same latitude where this enchanted Island is said to be situate, she was suddenly surprised, and involved in a mist, yet stood under a very stiff gale; whereupon she endeavor'd to lie by, but could not, for she would not answer to her helm. Whilst the men were chasing and cursing, one instantly cried out, Land! Land! Helm-a-lee, for the love of God. The master being alarm'd at this dreadful noise, look'd out, and saw huge high rocks just upon his very bow; whereupon crying out suddenly to Heaven for mercy, those rocks and land adjoining immediately, seem'd to drop a curtsy under water, and the master thought the vessel sail'd clear over them.

The writer then recounts a fanciful dream of himself visiting the island.

Then did I ponder with myself what this dream should signify: after various considerations, I concluded this must be O Brazeel, and that I was the man must be its happy discoverer.

And now he endeavors to enact the prognostication.

Having concluded on the design, we made no delays, but getting seamen aboard befitting our purpose, on October the 9th, 1672, we set sail. We thus continued doing about seven days: on the eighth day in the morning, we espyed a blue cloud at West-South-West; the sight hereof overjoy'd only the master, and myself (for there was none of the seamen privy to our design;) and that we might the sooner enjoy the fruits of our longing expectations, we made all the sail we could up to it: the nearer our approach, the blacker it grew; and having sail'd towards it about half a watch, it vanisht in an extraordinary flash of lightning.

1685 pamphlet [A Strange and Wonderful Discovery Newly Made of Houses Under Ground](#) reminds readers that,

Several parts of the earth which were known, have been lost, as that island near Ireland, which is described in maps, but cannot now be found by all the industrious search made after it.

Roderick O'Flaherty, [A Chorographical Description of West or H-Iar Connaught](#) (1684) describes a report from a doctor who said he was kidnapped by two strangers and taken to the enchanted island.

There is now living, Morogh O'Ley, who imagines he was himself personally on O'Brasil for two days, and saw out of it the Iles of Aran, Golamhead, Irrosbeghill, and other places of the west continent he was acquainted with.

The kidnapping victim returned with a medical journal that he was not to open for seven years. Known as the [Book of the O'Lees](#), the work, now in the library of the Royal Irish Academy, shows names, stages and cures for a variety of illnesses.

Unlike playwright Head, O'Flaherty was a scholar, and as such, the more-reliable scribe. In this case, however, O'Flaherty's reporting a tale of folkloric interest, probably not one in which he would have put factual credence.

[Ogygia, Or, A Chronological Account of Irish Events](#) (1695), again by O'Flaherty,

The people of Aran, with characteristic enthusiasm, fancy, that at certain periods, they see Hy-Brasail, elevated far to the west in their watery horizon. This has been the universal tradition of the ancient Irish, who supposed that a great part of Ireland had been swallowed by the sea,

and that the sunken part often rose and was seen hanging in the horizon: such was the popular notion.

Whether it be real and firm land, kept hidden by special ordinance of God, as the terrestrial paradise, or else some illusion of airy clouds appearing on the surface of the sea, or craft of evil spirits, is more than our judgment can sound out.

In A Long Ramble, or Several Years Travels, in the Much Talk'd of, but Never Before Discover'd, O-Brazil (1712), the narrator alleges to have returned from a long stay on "Brazil Island," which "Lies in some uncertain Sea..., having no anchors or cables to hold it", as a result of which, it "is continually floating about, and consequently never steady." To English readers of the day, "Brazil" would connote Ireland, regularly referred to in condescending terms. The pamphlet is a satire on England, however, an irony heightened by the repeated references to "this noble island."

From History of Brazil (1810), by Robert Southey,

The Harleian Catalogue gives this title, O Brasile, or the enchanted island, being a perfect relation of the late discovery of an island on the North of Ireland, It may save trouble to some future enquirer if I add, that the enchanted island is only mentioned in a dream, and that the bulk of this thoroughly worthless pamphlet consists of a stiuless satire upon the Welsh.

Tales of Hy-Brasil bear the traits of folklore, not history. As such, we might expect them to carry on in works of entertainment or "cultural studies" in today's parlance. We'd not have expected them to carry on in cartographic references.

The Cartography

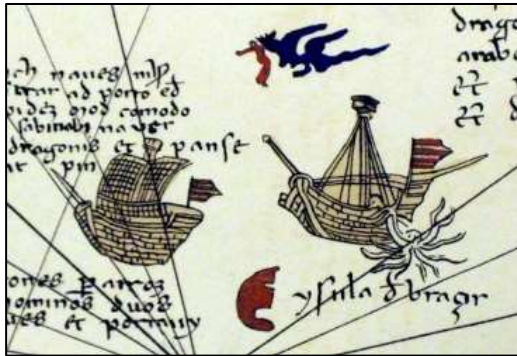
As maps of the era were not necessarily oriented with north to the top, we've taken the liberty to rotate them as needed.

Dulceti/Dolcet/Dalorto/Dulcert, 1325, is the first map to depict "Bracile," a near-circular disc off the southern coast of Ireland, said by one wry cartographic historian to resemble a red ink spot,

Cartographers of the 15th century delineated shores of known, but unexplored, shores with a uniform, scalloped edge to indicate imprecise geographic information, but they included general configuration and offshore rocks to dispel doubt about the actuality. Only Antillia and Hy-Brasil were shown as a pure geometric shape.



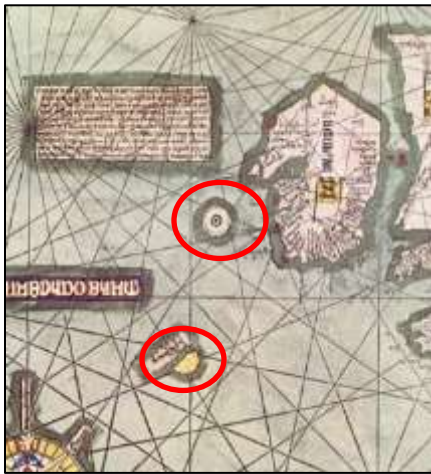
Pizzigani, 1367, includes three islands named Insula of Bracir, the detail below of the middle one's "inverted umbrella" configuration



In his In Northern Mists (1911), Fridtjof Nansen hypothesizes that east-west channel dividing the upper island represents the River Styx

Perhaps in deference for authority, mapmakers of the era were more prone to add than to subtract features. In a circa-1450 map in St. Mark's Library, Venice, Brasil appears in four places.

Below, two editions of Catalan, 1373, showing a large circular "Insula Berzil" and another below. Solerio, 1385, likewise shows "Insula de Berzil" to the west of Ireland, and another in the Azores, The ring enclosing small dots is thought by some to suggest volcanos.



The lower isle is in the Azores, perhaps Terceir. John Huighen van Linschoten his Discours of Voyages into ye Easte & West Indies (1598) describes the very-real island.

It hath on the one side in manner of an elbow sticking forth, two high hills, called Bresyle, which stretch into the sea, so that a far off they seem to be divided from the island.

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Below, a perusal through the map case.



Bibliotheca Phillipica, 1424



Fra Mauro, 1459



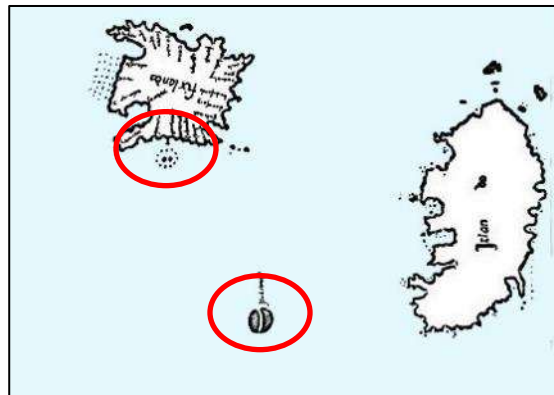
Bianco, 1436



Pareto, 1455



Benincasa, 1470



Catalan chart, c. 1480, showing a second "Illa de Brasil" south of "Illa Verde," Greenland.

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Canepa, 1489



Bohemus, 1492



Aguiar, 1492



Russo, 1508



Reis, 1513



Ptolemy, 1513



Waldseemüller, 1513, "Admiral's Map"



Waldseemüller, 1513, "Stevens-Brown,"
Brisil island in the Caribbean

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Fries, 1535



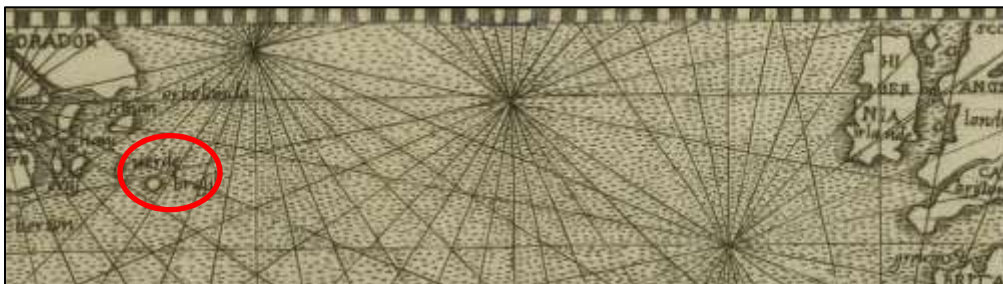
Rotz, 1542



Portolan Atlas, 1544



Prunes, 1553



Nicolai, 1554, the island now near North America

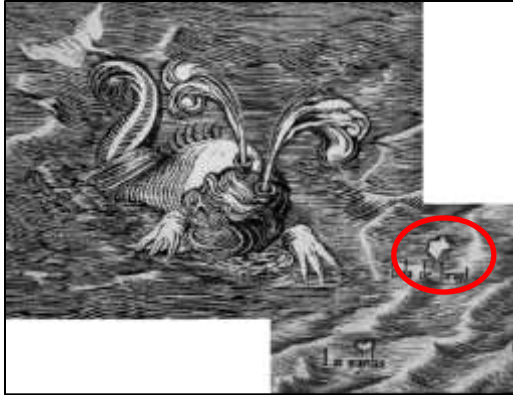


Forlani, 1560



Anonymous, c. 1570

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Gutierrez, 1562



Ortelius, 1570



Ortelius, 1572



Ortelius, 1573



Mercator, 1541



Mercator, 1595

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Mercator, 1613



Mercator, 1623



Wagenhaer, 1583



Magini, 1597



Munster, 1588



Hondius, 1607



Blaeu, 1617



Blaeu, 1635

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Speed, 1627



Albernaz, 1630



Roiz, 1633



Dudley, 1646



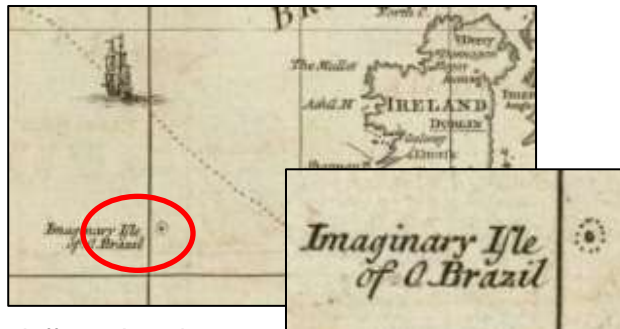
Doncker, 1665



Bowen, 1755



Bowels, 1794



Jeffreys American Atlas, 1776

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Brazil Rock

Centuries of exploration having revealed nothing resembling the island of myth, but oceanic rocks having been reported, 18th-century mapmakers began to switch the name from "Brasil Island" to "Brasil Rock," a physically-describable feature.



"Roche de Brasil," Covens, 1720



"Brasil Rock," Nautical chart, 19th century

Alexander von Humboldt, Examen Critique II (1836-39),

Of the elements of 14th- and 15th-century mythical geography. I can name eleven islands, only two of which, Mayda and Brazil-Rock, in the meridian of the Canary Islands, west of the Bay of Biscay and Ireland, remain on our modern maps. The others do not deserve to be called marvelous islands. In historical myths we can generally discover some grain of truth, but the depth is veiled by uncertainty of the relative positions, configuration errors and breadth, and the exaggeration of often-repeated stories from an unknown source.

John Purdy's Memoir, Descriptive and Explanatory, to Accompany the General Chart of the Northern Ocean, Davis' Strait and Baffin's Bay (1845) expresses what was by then a common doubt, but note that it's downsized to "rock" status.

Brasil Rock, in lat. 51° 10', and long. 16°

It has been variously represented in different charts, although its existence has been doubted. Messrs. Verdun and Borda have added to their remarks upon this rock that they do not believe it to exist.

It was, however, seen in the year 1791, by the company and master of an English merchant ship, the commander of which favored the editor of the present work with a description of it, stating that it is really a high rock, or islet, apparently bold-to, and to which he passed so near, that he could have cast a biscuit on shore. The longitude, according to his computation, was about 16° W., but we suspect that, if it exists, it is more to the westward.

In his 1853 edition, Purdy relegates the 1791 assertion to just a story.

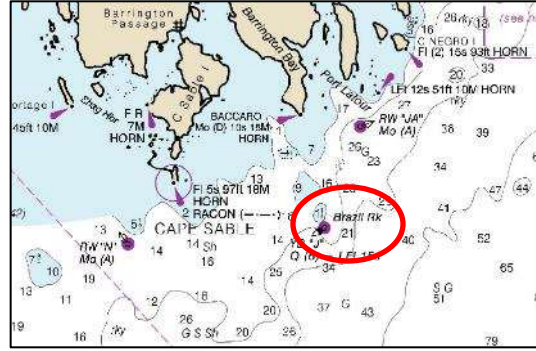
As noted in The discovery of America and its Significance to the History of the World (1892) by Konrad Kretschmer,

Only in the Atlas Jeffery's Atlas (1776) was the very existence of the island questioned. But the name is not yet entirely disappeared from charts this century because the Admiralty Charts still show a cliff, 6 degrees west from the southern tip of Ireland, by the name of Brasil Rock

Brazil Rock is yet with us, submerged in shoal off Cape Sable, the southernmost point in Nova Scotia.

Nova Scotia to the Gulf of Florida. (1836), by Michael Blachford,

Brazil Rock lies in latitude 43° 24' 15" N. and longitude 65° 22' W. It is a flat rock covering an area of 10 yards, over which are only 8 or 9 feet at low water; within 100 yards from its base are 6 to 8 fathoms; to the southward, at 1 mile from the rock, are 30 to 35 fathoms, but towards the shore the soundings are regular, from 20 to 15 fathoms, sandy bottom. The tide, by running strongly over the shoal ground, causes a great ripple, and makes the rock appear larger than it really is.



From "Doubtful Islands, Rocks, Shoals and Vigias," Complete Atlantic Directory (1869), by William Rosser and James Imray,

Lat. N.	Long. W.	Name.	Date.
61 0	19 10	Brasil rock	1742
51 10	16 0	Brasil rock	1791

"Brasil Rock," Report of the Superintendent of the United States Coast Survey for the Year Ending June 30, 1877 (1880),

This is, perhaps, the most notorious rock in American waters. Situated eight miles S. 10 by E. 1/2 E., by compass, from Cape Sable light, it lies directly in what would be the track of our largest vessels but for this lion in the path. I undertook to hunt up the record of this rock with great confidence, but was much perplexed by what seems to me a palpable error in my earliest and most eminent authority, M. de Chabert... As regards Brazil Rock he makes the following strange statement:

It is three and a half leagues southeast a quarter east from the point of the cape by compass, as I have myself redetermined it while I was there; it breaks and uncovers at low-water.

"Notice to Mariners," Canada Gazette, Match 4, 1906,

The bell buoy heretofore moored 1/2 S. 11° W. from Brazil rock, south coast of Nova Scotia, has been replaced by a combined gas and whistling buoy, moored in the same position. The buoy is of steel, cylindrical, with a curved top, surmounted by a pyramidal steel frame a whistle and a lantern. The buoy is painted in red and black horizontal bands with "Brazil Rock" painted on the deck.

Nova Scotia Pilot: Bay of Fundy, Southeast Coast of Nova Scotia and Coast of Cape Breton Island (1920), United States Hydrographic Office

Brazil Rock is a dangerous off-lying rocky shoal having only 2 fathoms over it, with deep water close-to; the sea breaks heavily on this rock in bad weather, but during fine weather it is only marked by a tide rip. It has deep water around it. It lies 5-1/2 miles 169° from Baccaro Lighthouse, and 7-3/4 miles 68° Cape Sable Lighthouse.

The tidal currents rush with great rapidity over the above rock and create a considerable rip.

There likewise is a "Brazil Shoal" off Grand Manan, New Brunswick.

Baffin Island

Some believe Brasil Island to be Baffin Island, a round, bifurcated island that like the legendary island, has been mapped more and more westward as cartography improved.



Ruysch, 1508, below, shows Baffin as a split island in the Gulf of Greenland.



Another argument for Baffin: Dalorto's early works place Brasil in the middle of numerous "Fortunate Islands" and Baffin is one of over 90 major islands in the Arctic Archipelago.

Rockall

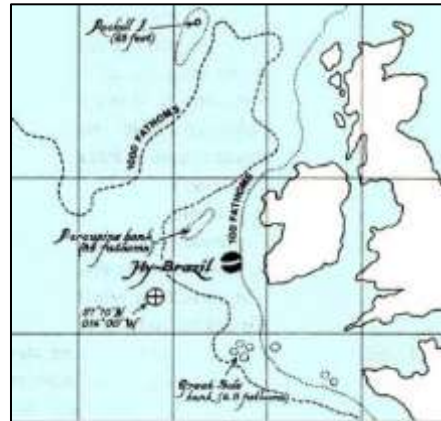
Brasil might be the island of Rockall, a 27-meter wide, 23-meter high summit of an extinct volcano, an unresolved territorial dispute between Ireland, the United Kingdom, Denmark, and Iceland.



Porcupine Bank

"On Hy Brasil, A Traditional Island off the West Coast of Ireland, Plotted in a MS. Map, Written by Sieur Tassin," Journal of the Royal Geological Society of Ireland 15:3 (1880), by W. Frazer, suggests Brasil to be a shoal on Porcupine Bank.

Close to Bray, during last winter's storms, no inconsiderable portion of shore was removed; and if, in addition to the strong breakers of the Atlantic, we consider that a process of subsidence has been taking place, submerging not only bogs, but the work of man's hands, as on the Aran Isles, surely it might happen that far less than 250 years of ceaseless surge is capable of removing more clay and rock than this little speck upon the waters must have had.



During the last Ice Age (at its peak 20,000 years ago), Porcupine Bank may have been exposed. As human habitation did not reach the edge of Galway until about 3500 BC, however, it is doubtful that such an island would have been seen.

"The Lost Island of Hy-Brasil," December 28, 2012, altereddimensions.net, isn't about to concede the possibility, however.

Modern day researchers and archeologists have searched for Hy-Brasil and note that in the location west of Ireland, there are many shallow areas of water in an area called Porcupine Bank, that appear to have been an island at some point in time.

In 1980 Sgt Jim Penniston was stationed at Brentwaters military base. During the UFO incident in Rendlesham Forest ["Britain's Roswell"], he claims that he touched a UFO and telepathically received a message in the form of binary code, which he wrote down in a small note book shortly after the incident, telling no one about it for three decades.

Programmer Nick Ciske, hired by the History Channel, deciphered the binary code and discovered that it contained navigational coordinates of an area off the west of Ireland. The coordinates lay in the exact location that ancient cartographers mapped the island of Hy-Brasil.



Bay of Brittany

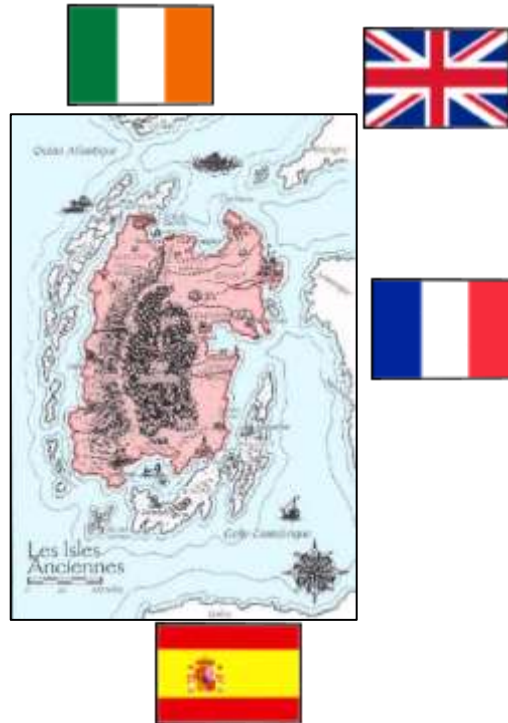
From Mysterious Celtic Mythology in American Folklore (2010) by Bob Curran,

On July 7, 1878, the inhabitants of the Irish seaside town of Ballycotton in County Cork were both surprised and astounded by the sudden appearance of an island that had not been seen in the ocean before. Sightseers gathering on the strand were able to see the new island quite plainly and were able to make out its coastline, woodlands, fields, and deep valleys. A number of County Cork fishermen set out in boats to investigate but as they approached, the entire island winked out of existence, leaving them amazed and wondering.

The Lyonesse (1983, 85, 89) trilogy by Jack Vance picks up on this possibility, the setting being the Ireland-sized isle of Hybras -- "Hy-Brasil," less the "il" -- southwest of Cornwall and west of Brittany. Vance's islands have since submerged, leaving behind only a smattering of legends and a few place names.



Not Lyonesse, but St. Michael's Mount, a tidal island off Land's End, Cornwall,



As for South America

Though it would add to the yarn, there is no clear etymologic tie between Hy-Brazil and the South American nation of roughly the same name. The name of the elusive island is itself elusive:

Celtic, Uí Breasail: descendants of Breasal, one of the ancient clans of northeastern Ireland.
Celtic, Í: island; bres: beauty, worth; great, mighty
Bressalius de Durthach, a missionary of the 6th century

The modern nation of Brazil, on the other hand, bears the name of one of its first exports, the word "brazil" used during the Middle Ages for red dyewood, or more generally, any tree or plant from which red dye can be extracted. We see its use in Chaucer's Canterbury Tales (c. 1390)

Him nedeth nat his colour for to dyn with brasile, ne with greyn of Portyngale.

Illusion

Mysterious Celtic Mythology in American Folklore (2010) by Bob Curran,

On July 7, 1878, the inhabitants of the Irish seaside town of Ballycotton in County Cork were both surprised and astounded by the sudden appearance of an island that had not been seen in the ocean before. Sightseers gathering on the strand were able to see the new island quite plainly and were able to make out its coastline, woodlands, fields, and deep valleys. A number of County Cork fishermen set out in boats to investigate but as they approached, the entire island winked out of existence, leaving them amazed and wondering.

In "Brasil and the Legendary islands of the North Atlantic: Their History and Fable," Proceedings of the Royal Irish Academy 30:C (1912), Irish folklorist T.J. Westropp lays claim to having seen this island himself, three times, in fact.

The Aran people now believe that Brasil is seen only once in seven years. They call it the Great Land. In Clare, I have heard from several fishermen at Kilkee and elsewhere that they had seen it; they also bold legends of people lost when trying to reach it.

I myself have seen the illusion some three times in my boyhood, and even made a rough colored sketch after the last event, in the summer of 1872. It was a clear evening, with a line golden sunset, when just as the sun went down, a dark island suddenly appeared far out to sea, but not on the horizon. It had two hills, one wooded, between these, from a low plain, rose towers and curls of smoke. My mother, brother, Ralph Hugh Westropp, and several friends saw it at the same time. One person cried that he could "see New York."

Westropp, however, makes clear that this was what he "saw," not what he knew to be.

[Belief in such islands] colored Irish thought; stood for the pagan Elysium and the Christian Paradise of the Saints; affected the early map-makers; and sent Columbus over the trackless deep to see wonders greater than Maelduin and Brendan were fabled to have seen, till Antilha, Verde, and Brazil became replaced by real islands and countries; and the birds, flowers, and fruit of the Imrama by those of the gorgeous forests of the Amazon in the real Brazil.

Westropp concludes with a quote from Plato.

"Admiration is the first step leading up to knowledge, for he that wandereth shall reign."

Any number of popular writers have seized upon Westropp's writing as citable-evidence of a recent sighting, oblivious to the fact that the scholar was alluding to apparition. Such is the perpetuation of myth.

In 1901, Westropp took a photograph of a companion with a large box camera upon a tripod at Dun Aengus, the camera pointed towards the Atlantic in the purported direction of Hy-Brasil.



1901

Below, 2007



For an exhibition "Preliminary Sketches for the Reappearance of Hy Brazil," *Utopian Studies* 21:1, 2010, Sean Lynch likewise positioned a camera on the cliffs. Each evening at sunset, photographs were taken at moments where light and shadow suggested the potential presence of a landmass.



Nationalism

The fires of Irish nationalism, cumulating in the formation of the Irish Free State in 1922, were fanned by the Irish literary revival of the latter 19th and early 20th-centuries. Gaelic heritage, dismissed by English overlords as ignorant superstition, was revived as cultural foundation for a proud people.

Revolutions rarely begin as revolutions, however, and for our purposes, we can turn back to the popularization of Irish poetry. We'll begin with Gerald Griffin's romantic "Hy-Brasail, The Isle of the Blest," (c. 1830), a poem still put to music.

*On the ocean that hollows the rocks where ye dwell
A shadowy land has appeared, as they tell;
Men thought it a region of sunshine and rest,
And they called it Hy-Brasail, the isle of the blest.
From year unto year on the ocean's blue rim,
The beautiful spectre showed lovely and dim;
The golden clouds curtained the deep where it lay,
And it looked like an Eden away, far away!*

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To the deported revolutionary John Mitchell, in Jail Journal (1854), Hy Brasil is the place of a promise deferred,

Often while I sit by the sea, facing that north-eastern arc, my eyes, and ears, and heart are all far, far land by intense gazing I can behold, in vision, the misty peaks of a far-off land -- yea, round the gibbous shoulder of the great oblate spheroid, my wistful eyes can see, looming, floating in the sapphire empyrean, that green Hy Brasil of my dreams and memories.

Mitchel perpetuates "Ireland" in his mind as a place beyond the materiality of an untrustworthy world.

I see it, I hear it all -- for by the wondrous power of imagination, informed by strong love, I do indeed live more truly in Ireland than on these unblessed rocks.

Mitchel's Ireland departs its moorings to enter the realm of mythology, Hy Brasil, a once and future untainted Ireland, but, paradoxically alongside the knowledge that it can only be achieved as a cracked image.

As commented upon by Colin Graham in Deconstructing Ireland, Identity, Theory, Culture (2001),

Mitchel's floating, Atlantic Ireland is more than an act of desperate, exilic imagination. Detaching Ireland from its real place, he can replace himself there, in an Ireland in keeping with the Ireland which circulates around him on Ireland Island -- his summoning of Hy Brasil retains... a sense of the political, and inwardly he 'plots' an overturning of the laws of nature, conspiring against the imperial in its conspiracy with the imperial.

Less political, but drawing from the same cultural well, is William Larminie's "The Finding of Hy Brasil," Glanlua and Other Poems (1889).

*As, unto one that watches many a year,
Where Eire's hills look far into the west,
In hope perchance that from the ocean's breast
Its head the bright Hy Brasil may uprear, --
The golden hills he dreams of once appear
Half seen among the clouds of sunset drest,
In many-tinted splendour, but his quest
Finds not again that vision far or near.*

*So, mocked by glimpses of a glorious time,
Long have I gazed far into Eire's past;
But now at length on the enchanted strand,
And those evasive splendours, more sublime
Than dream, the potent fire-spell has been cast;
Lo ! on Hy Brasil's long-sought shores I stand.*

Non-political in intent, but at the same time reflective of a growing public familiarity with nationalistic imagery, is Francis Joseph Bigger's report of an excursion of the Irish Field Club Union to Galway in Irish Naturalist, 1895.

Indeed, long after the excursion was over, members were seen straggling about Connemara and the islands of the sea, quite unable to drag themselves away from the glories and mysteries of the west, ever seeking for that Hybrasil which lay in the lap of the setting sun.

Dora Shorter, "I Have Been to Hy-Brasail," A Little Garland of Celtic Verse (1899), the best known of the "Hy-Brasil" poems.

*I have been to Hy-Brasail,
And the Land of Youth have seen,
Much laughter have I heard there,
And birds amongst the green.*

*Many have I met there,
But no one ever old,
Yet I have left Hy-Brasail
Before my time was told.*

*Love have I known, too,
As I shall meet no more;
Lost is the magic island,
And I cannot find the shore.*

*Since I have left Hy-Brasail,
Age has encompassed me,
She plucks me by the shoulder
And will not let me be.*

*Her face is grey and mournful,
Her hand is hard and cold,
Yet I have left Hy-Brasail
Before my time was told.*

Describing a fleeting vision of paradise followed by the harsh return to reality "before my time was told," the subject of the work becomes not the island, but rather the unendurable nature of relentless grief. Shorter would eventually be buried in Glasnevin cemetery, as close to the mythical Hy Brasil as she could perhaps aspire.

Ethna Carbery came from a family of radical Republicans. In "I Breasil," The Four Winds of Eirinn (1902), the island yet remains to be claimed.

<p><i>The sacred trees stand in rainbow dew, Apple and ash and the twisted thorn, Quicken and holly and dusky yew, Ancient ere ever grey Time was born.</i></p> <p><i>The oak spreads mighty beneath the sun In a wonderful dazzle of moonlight green -- O would I might hasten from tasks undone, And journey whither no grief hath been!</i></p>	<p><i>Were I past the mountains of opal flame, I would seek a couch of the king-fern brown, And when from its seed glad slumber came, A flock of rare dreams would flutter down.</i></p> <p><i>But I move without in an endless fret, While somewhere beyond earth's brink, afar, Forgotten of men, in a rose-rim set, I-Breasil shines like a beckoning star.</i></p>
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A lecture by Irishman Roger Casement, British consul in Belém do Pará at the mouth of the Amazon, c. 1908, considers -- perhaps incorrectly -- at how the Irish origins of modern Brazil had been written out of the history books,

That Brazil owes her name to Ireland -to Irish thought and legend - born beyond the dawn of history yet handed down in a hundred forms of narrative and poem and translated throughout all western Europe, until all western Europe knew and dreamed and loved the story, and her cartographers assigned it place upon their universal maps,

Legends die hard - and doubtless the legends of the dye-wood's origin of the name Brazil, resting as we have seen on no historical proof and abundantly disproved by antecedent application of the name no less than by the clear and continuous Irish record of the land, the locality, the search and the name, will die slowly. The "Scotch-Irish" origin of so many of the American people already shows signs of failing vitality. As the study of Irish records becomes more general those who today are still ashamed to claim descent from the "mere Irish" will discover that a truly Irish origin may even be fashionable. That it has always carried with it a storied value to the discerning, an inspiration to the brave, and an immemorial claim upon the generous and high souled has been hidden from men's minds, not by the faults of Irish character so much, as by the wanton obscurity in which the home of that people has been plunged.

That darkness was not a chance cloud, and now that it is lifting others besides Irishmen and their multitudinous descendants in the western world, may learn from the enduring legend of

Chapter 80 -- Greet the Locals with "Dia Duit," not "Olá"

Hy-Brasil, to prize the records of a race who have given much to mankind, besides the historic facts of ancient fable and who are destined, if they will still honor their own past, to discover fields of thought and action for "the dauntless far-aspiring spirit of the Gael."

Assertion that the name uplifts a subjected nation drew wrath from Casement's employer. He was eventually stripped of his honors and executed for treason.

Kenneth Rand, an American, wrote "A Song of Hy-Brasil." *The Dreamer, and Other Poems* (1915), not for politics, but rather as romantic inspiration, furthering the vision of Hy Brasil as a beckoning, albeit unobtainable, paradise.

*West away beyond the world, there my kingdom lies --
Where the sunset-kindled clouds flame across the skies.
You could know my kingdom, too, had you eyes to see
Where my bannered cities blaze in their majesty!
Just beyond the western hills, ere the shadows run,
You could glimpse my castles in my Province of the Sun.*

*West away beyond the world, I am fain to follow
(Red the fairy hilltop flares o'er the purple hollow!)
For the road is plain to find, where it stretches white
Like a pallid ribbon in the ebon locks of Night.
And oh, my heart is over-fain to chase the sunset-gleam
Till west away beyond the world I win again my dream!*

In his "Hy-Brasil," (1920), Australian Henry Kendall likewise wasn't opining on Irish politics, but the reference again advanced the metaphor's exposure.

*And the daughter, who had fasted, who had spent her days in prayer,
Till the glory of the Savior touched her head and rested there,
Turned her eyes towards the sea-line -- saw beyond the fiery crest,
Floating over waves of jasper, far Hy-Brasil in the West.*

*Never since hath eye beheld it -- never since hath mortal, dazed
By its strange, unearthly splendor, on the floating Eden gazed!
Only once since Eve went weeping through a throng of glittering wings,
Hath the holy seen Hy-Brasil where the great gold river sings!*

*But, behold! our eyes are human, and our way is paved with pain,
We can never find Hy-Brasil, never see its hills again!
Never look on bays of crystal, never bend the reverent knee
In the sight of Eden floating -- floating on the sapphire sea!*

For more on Eden, see Chapter 34.

We could bring to light any number of further literary Hy-Brasils, but we'll end with just two, fittingly by Irish poets, who while living in their now-free homeland, continue to gaze beyond the western horizon.

Louis MacNeice, "Hy Brasil" *Collected Poems* (1949),

*Both myth and seismic history have been long suppressed
Which made and unmade Hy Brasil -- now an image
For those who despise charts but find their dream's endorsement
In certain long low islets snouting towards the west
Like cubs that have lost their mother.*

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Nuala Ní Dhomhnaill, "Hy-Breasil," The Astrakhan Cloak (1992)

*I hear you call
Out to me
In the night*

*Asking me to come
To the isle
Of enchantment.*

*Your voice sounds
Like thunder
O'er the foam.*

*Magnificent
And worshipful
Is its boom-*

*"Come to me,
come to me, all
who are tired."*

Popular Culture

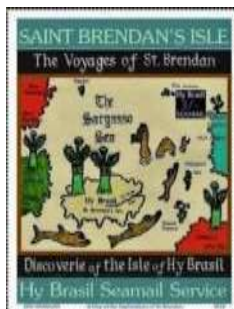
Faux Postage Stamps



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Lacking denominations, our last two stramps make no effort to pass as philatelis, but no matter.

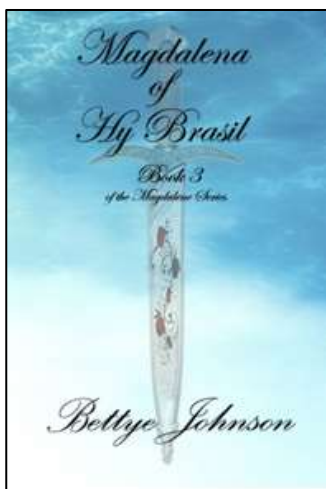
Both employ the map motif.



Novels having "Hy Brasil" in the title. We'd have more if we included fiction simply about the island or nonfiction pertaining to the lore.



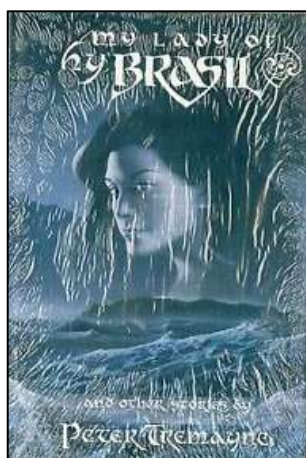
Hy Brazil (2014), Gerald Killingworth



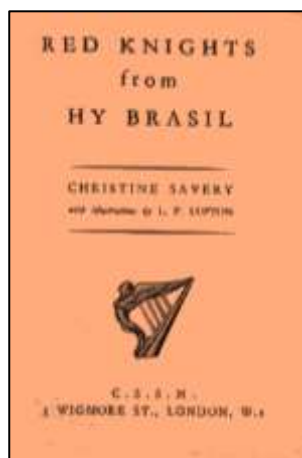
Magdalena of Hy Brasil (2013), Bettye Johnson



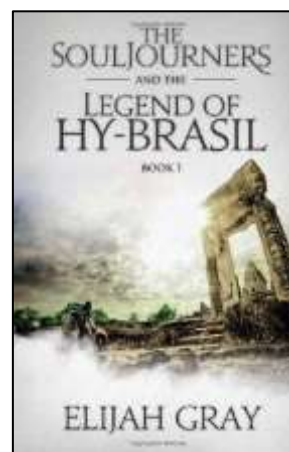
Hy Brasil (2003), Margaret Elphinstone



My Lady of Hy-Brasil and Other Stories (1987), Peter Tremayne



Red Knights From Hy Brasil (1955), Christine Savery



The Souljourners and the Legend of Hy-Brasil, (2012), Elijah Gray

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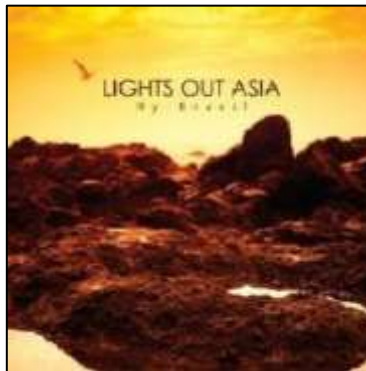


Tread Lightly A Tale of Hy-Brasil (2012), McKenzie McCann

Three albums named "Hy Brasil"



Our Lucid Reality



Lights Out Asia



Canola Tenderfoot

In the 1989 British film Erik the Viking, Erik must find the Island of Hy-Brasil, where lies the "Horn Resounding," whose sound will awaken the gods of Valhalla and bring an end to strife.

Erik and band make landfall on Hy-Brasil, a peaceful haven of frivolous people who inform them that weapons of any kind are banned, for the island will sink beneath the sea if ever blood is spilled upon it.



After Erik's quest spills blood on the land and the ocean pours in, Hy Brasil's King Arnulf (Monte Python's Terry Jones in a white toga, opulent curled wig, and flowers in his hair) insists, "Let's stick to facts. There has never been a safer, more certain way of keeping the peace. So whatever's happening, you can rest assured, Hy Brasil is not sinking," as waves close over his heads.

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At least the film catches the folkloric spirit of Hy-Brasil as a favored land. From here on out, however, Hy-Brasil is portrayed as a place of terror.



Queen of Hy Brasil



Guardian of Hy Brasil

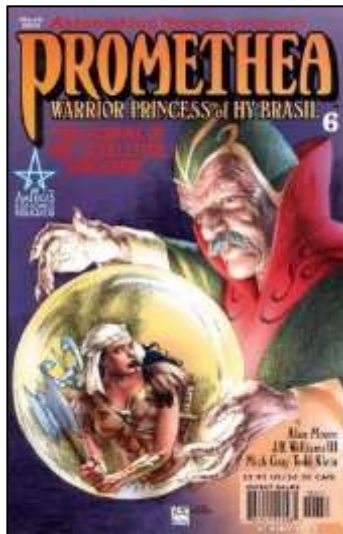
Aquaman 5, 1996



Clan of the Vein. The Girl of Hy Brasil (2016) by Neo Edmund and Neil D'Monte

Astonishing Stories' Promethea novellas begin with Promethea, A Warrior Princess of Hy Brasil 2000. Interactive reincarnations of the main character is the key to creating 15 episodes.

In 1999, Barbara helps Sophie return to Hy Brasil -- harkening back to the adventure comics of the 1930s -- and escape the reptile manigators.



Virtual blood can be shed in quantity on HyBrasil in the online game Dark Age of Camelot

Conclusions

As Irish historians seem to outnumber those who remain in Eire, further opinion regarding the fate of Hy-Brasil is not needed, but we'll venture our thoughts, anyway.

1. It's most unlikely that ancient Hibernians discovered far lands and returned to tell the story. From their Scandinavian neighbors, however, the Irish would have been vaguely aware of at least Iceland and Greenland.
2. Alleged western isles provided a setting for both pagan and early Christian tales of adventure.
3. Poetry is in the Irish nature, and a grand fireside tale, in the Irish spirit.
4. Hy-Brasil will remain floating in the same manner in which has floated for centuries.

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Chapter 80 -- Greet the Locals with "Dia Duit," not "Olá"

As observed by Terry Pratchett in [A Slip of the Keyboard: Collected Nonfiction](#) (2014),

Fantasy imposes order on the universe. Or, at least, it superimposes order on the universe. And it is a human order. Reality tells us that we exist for a brief, beleaguered span in a cold infinity; fantasy tells us that the figures in the foreground are important. Fantasy peoples the alien Outside, and it doesn't matter a whole lot if it peoples it with good guys or bad guys. Putting Hy-Brasil on the map is a step in the right direction, but if you can't manage that, then "Here Be Dragons" is better than nothing. Better than the void"

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CHAPTER 81 LEVITATE IT

It's difficult enough to levitate an island, but the greater challenge is to have the waterfall fall, but the island itself, not.



In this chapter we'll visit sky islands, those domains blissfully floating above the terrestrial landscape. Our tasks will be to discern which islands may have physical possibility, or perhaps more accurately put, pseudo-physical possibility.

Flying Creatures

The Birds (414 BC) by Aristophanes follows Pisthetaerus, an Athenian who persuades the world's birds to create a city in the sky from which to control communication between men and gods,

"If you build and fortify it, you will turn your pole into a city. In this way you will reign over mankind as you do over the grasshoppers and you will cause the gods to die of rabid hunger"

"The air is between earth and heaven. When we want to go to Delphi, we ask the Boeotians for leave of passage; in the same way, when men sacrifice to the gods, unless the latter pay you tribute, you exercise the right of every nation towards strangers and don't allow the smoke of the sacrifices to pass through your city and territory."



In a more-recent work -- but unlike Aristophanes', one that won't be in print 2500 years later -- the surface of the world of The Ellimist Chronicles (2010), by K.A. Applegate, is inhospitable for life, so the flying Ellimists dwell on chunks of crystal held aloft by the residents' strictly scheduled shifts of lift and recuperation.

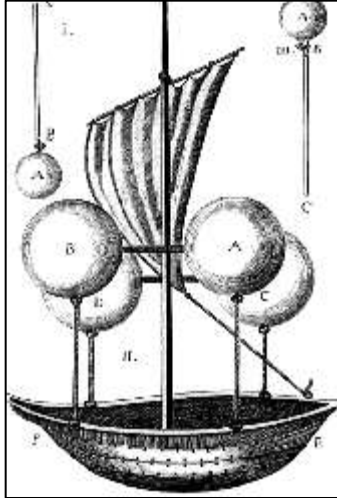
All in all, a bird-powered sky island makes a degree of physical sense, at least until one considers the number of birds or winged Ellimists required.

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Lighter than Air Possibilities

Dry air at sea level and 20° C has a density of approximately 1.2 kilogram/cubic meter. An island floating in the atmosphere by virtue of its density must be lighter.

An aerostat is a vehicle held aloft by a balloon filled with lighter-than-air gas.



An "Aerial Ship" supported by four copper spheres from which the air is evacuated, as envisioned by Francesco Lana de Terzi, the "Father of Aeronautics," 1670



Louis Guillaume de La Folie 1775 science fiction

A pair of island-bearing possibilities,

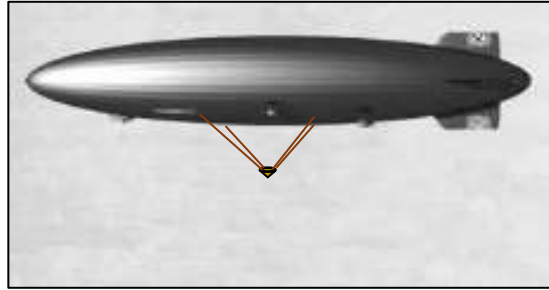


But let us check a some numbers. One cubic meter of helium can lift 1.06 kilograms. A like volume of hydrogen can lift 1.14 kilograms. The 806-foot-long Hindenburg, designed for former, but unfortunately switched to the latter, had a lifting power of 232 tons, 130 of which were for the dirigible itself.

A conical island 26 feet in diameter, 13 feet thick at the middle, would weigh in the order of 100 tons, roughly what the Hindenburg might lift.

An approximately-scaled drawing.

To cross the Atlantic, however, the dirigible needed some 80 tons of fuel, leaving roughly 20 for the payload. Were the load an island, it would be about 14 feet in diameter, half the size drawn.



The earlier aerostat artwork, we're sorry to say, is artfully oblivious to scale.

Another misrepresentation of payload size, "A Real Castle in the Air," Amsterdam Daily Democrat and Recorder, September 15, 1893,

Mr. Tobiensky, the engineer, is starting a company for the introduction of a novel feature to the Antwerp exhibition, which is to be started next year. It is to consist of a raft, with an area of about 20 square yards, and constructed of bamboo rods and steel and aluminum tubing, on which a palatial restaurant is to be erected and the whole suspended in midair at an altitude of 500 yards by means of captive balloons.

An ingenious combination of anchor cables will hold this "aerial castle" in position and effectively prevent any oscillation even in the strongest gale. Two smaller captive balloons, each to carry eight or ten persons, will serve to convey visitors to this floating island and back again to terra firma. Each of the larger balloons is fitted with a silk tube, through which, by means of an automatic arrangement, a fresh supply of gas is obtained when required. Electric lamps of intense brilliancy are fitted to the raft for the purpose of lighting the exhibition grounds. The entire fabric can be brought down to the ground in 10 minutes by means of steam winches.

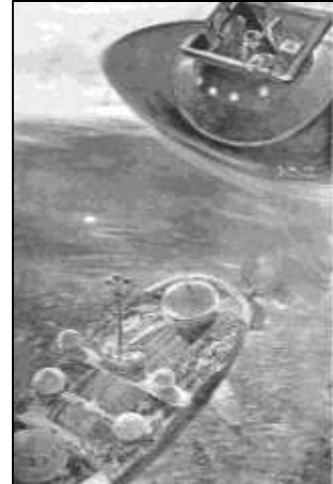


Rudyard Kipling's With The Night Mail (1905), the illustration to the right, has airships lifted by "Fleury's gas" and energized by "Fleury's ray," sufficient for airships to achieve speeds of 210 knots without straining the hull or engines.

We know that Fleury's gas can lift anything, as the world-famous trials of '89 showed.

Fleury's gas, with "its almost indefinite powers of expansion," seems indeed well suited to lighter-than-air transport, or at least will be, once Fleury discovers it.

The animated short film The Mysterious Geographic Explorations of Jasper Morello (2005) is set in a gothic world of floating islands with Victorian-style cities wreathed in smoke and crisscrossed by bridges. Steam-driven iron dirigibles trawl the "uncharted air" between.



If such airships seems doubtful, we could dispense with the balloon envelope, iron or otherwise, altogether if the gas were entrained in the island itself. Arianus, from the novel The Death Gate Cycle (1990) by Margaret Weis and Tracy Hickman, is a series of continental islands floating at different levels, their coral-like substance laced with gas.



The table-top game Warhammer 40,000 features a planet of floating islands, some about the size of a pebble, others home to entire cities. Homeworld is an immense gas giant with islands of rock floating where displacement dictates -- as it should -- how high each floats in the dense gasses. To make this universe work, however, the lower levels of gas would have to have a density greater than that of the rock.



In the game Winds of Aether, "aetherstone" is a lighter-than-air substance caused by vapors rising from the core of the planet and becoming embedded in the rock. Islands naturally float at the altitude at which their buoyancy balances their weight, again inarguably true in principal, but unachievable in practice.



Closer of home, and for once an executed fact, the 7-meter floating installation Is Land was constructed from polyurethane and covered in decorative foliage in 2011 in Gloucestershire. A lush utopia, the island floated just above everyone's reach.

Unfortunately for Is Land, however, a group of festers decided that it shouldn't be within anyone's reach and cut the tethers. Based on wind patterns and weather, Is Land may have landed somewhere in the Czech Republic.



Lodestone

Before magnetism was scientifically understood, application of a lodestone, naturally magnetized magnetite Fe_3O_4 , that can attract iron, was touted as explanation for any number of quandaries.



Geoffrey Gaimar's L'Estoire des Engles (1136-40) tells how Nascien, of Arthurian legend, approached too close to the Holy Grail and was blinded, but was then cured by blood dripping from the Holy Lance. After spending some time on a spinning **island**, Nascien departs on Solomon's ship and finds the Sword of David. When Nascien tries to use it to kill a giant, it breaks in two, its repair becoming an object of the Grail Quest.



Nascien carried to the Turning Island in a cloud



Nascien on the Turning Island dreaming of birds

A portion of the tale relates Nascien's visit to the "Turning Island," materials left over from Creation, now to be found floating in the Western Sea, rotating in sympathy with the heavens.

Lancelot-Grail: The History of the Holy Grail -- The Old French Arthurian Vulgate and Post-Vulgate in Translation (2010) by Norris Lacy paints the big picture, beginning with the formation of the Western Sea's lodestone from the four Aristotelian elements.

This island was rightly called turning because it is true that it turned. But everyone who has heard about it does not know how it turns, and it is right that this story show the truth, for if it did not clearly show the reason and knowledge about every doubtful thing it mentions, it would only be words interlaced together, just like some people who speak many words, claiming their truth, but who cannot cite any support, except that they have heard it from others.

At the beginning of all things, when the Founder of the world divided and parted the four elements which had all been piled up in one mass, and separated heaven, which is full of all light and purity, and which the Scripture calls fire, from the other three. He established it in the highest place, for He made it cover and enclose all the others. Because heaven and air and earth and water had once been a single mass, each one, even though they were all of clashing natures, was inevitably bound up with the others and linked according to its particular properties, heaven being by nature hot and light, and earth by nature cold and heavy.

Thus you can understand the clashes among them; they were harmful to one another and could not bear one another. Because the earth, which is heavy and cold and a mass of filth, touched heaven, which is light and hot and the source of all purity, it happened that heaven gathered up filth in the form of masses of iron slag from earth as well as rusty matter from water. But when the Sovereign Father, who is the source of all knowledge, had separated one from the other and disjoined them, He placed heaven in its true honor and led it to purity, for He made it clear and shining and light and gull of all warmth, while He left the earth cold and heavy, making it a mass of every heavy thing.

Once He had cleaned and purified heaven of all earthly slag and watery mist and shaken earth and water out of heaven's burning heat, this earthly slag and watery rust could not naturally rejoin the earth and water from which they had come. Nor could the heavenly heat and burning that were recovered from the earth and the water honorably repair to such a noble or pure thing as heaven, for they had gained no purity from earth and water, which are a mass of every kind of filth, while heaven, as you have indeed heard, is full of everything pure. Because none of them could rightly return whence it came -- neither the earthly iron slag to the earth, nor the

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watery misty matter to the water -- since they had retained some lightness and heat from heaven, and because the burning heat could not return to heaven, since it was sullied with the baseness of earth and water, all these three things had to stay in one mass.

Someone might say, "Air was piled up in the same way as these three; why doesn't this story speak about it?" It is proven truth that along with these three things that were amassed, there was a bit of air as well. The story agrees with this, but it says that there was so little that it is not necessary to speak about it.

Just as you have heard, the four parts that had been shaken together remained in one mass. And because this mass could not naturally return to any of these four elements for the reason the story has explained, it had to fight against itself, and so it did without fail, for insofar as there was fire in it, which is from heaven, it was light and pulled upward; and insofar as it contained earth, it bore down; and insofar as there was water, it was wet and quivering and clammy. But there was so little air that it drew no property from it. And because all the weight of the four elements is in earth and water -- since these two collected all heavy things -- the weight remained with them in the way you will hear.

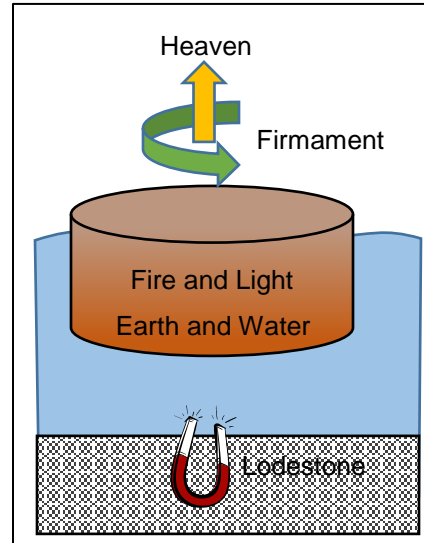
It was proven truth that by the will and pleasure of the One whom all things obey, this mass fell into the sea, and because it tended in part to be light, in accordance with what it fell from heaven, which is very light, it floated lightly and could not go to the bottom. In this way it floated for a long time in the sea without being able to stop anywhere, until it came into the Western Sea between Oragrine Island and the Port of the Tigers. In a sector of this sea, which lies between this island and this port, there is a great deal of lodestone, or magnetic iron ore, down on the bottom. You heard earlier that the story says the earth in the mass was iron slag; now this stone called lodestone has the property of liking iron above all and readily pulls it close. Once the iron is next to it and can join its force to it, it is not easy to separate it; the strength of the stone pulls the iron so much that it makes it touch it, unless there is more iron than stone or some other thing that can overcome the force of the magnet.

When the mass about which I spoke to you came floating up to the place where the lodestone was, it stopped, for the strength of the lodestone held it because it was ferrous, just as you have heard. But the force of the lodestone could not pull it enough to make it join to it, not because it had more iron than there was lodestone, but because the heavenly heat it held caused it to stay lighter, and that made it perform pull upwards.

Perhaps in this manner.

In this way, the mass remained in this place in the sea. Since then it has been called an island by the local people, because all the masses of land that appear in the sea and other waters, wherever they may be, are called by this name.

And along with this quality, it has yet another one that comes from the nature it derives from heaven, which is that every time the firmament turns, the island turns in the same way as the firmament that is, heaven.



Now the story has told you why the local people call it the Turning Isle.

And now returning to the story of Nascien,

As he was waking, he felt the island move and turn according to the timing of the firmament. Mystified and frightened, he raised his head and began to look around.

As he looked here and there, he heard such a great and marvelous battle and struggle at the bottom of the sea that it seemed to him that the entire island was about to sink and fall into an abyss. The tumult was so violent that no mortal man could see it without taking great fright, for throughout the island, from one end to the other, there was no place that did not tremble as violently as a leaf in a strong wind. This was because of the struggle at the bottom of the sea caused by the lodestone's effect on the ferrous earth.

The island had to turn at the command of the firmament whose nature it had kept in vain, while the lodestone whose force held the tenuous earth tightly did not want to allow it to move. But compared to the power of the firmament, that of the lodestone was like a little spring in comparison to the sea. And so you can be sure that it could not be held very well by the strength of the lodestone, for the firmament was more powerful.

For this reason, the island turned despite the force of the lodestone, the weight of the earth and the surrounding water. Thus, the contest was so great between the earth and the lodestone that at times the island sank into the sea until the water.

Fictional loadstone could levitate islands into the sky, Jonathan Swift's Gulliver's Travels (1726) being the classic example. Lemuel Gulliver, having been forced off his ship, reaches an unknown Pacific island where he becomes aware that above him floats the island of Laputa, held aloft by means of a lodestone.

The flying or floating island is exactly circular, its diameter 7837 yards, or about four miles and a half, and consequently contains ten thousand acres. It is three hundred yards thick. The bottom, or under surface, which appears to those who view it below, is one even regular plate of adamant, shooting up to the height of about two hundred yards.

Above it lie the several minerals in their usual order, and overall is a coat of rich mold, ten or twelve feet deep. The declivity of the upper surface, from the circumference to the center, is the natural cause why all the dews and rains, which fall upon the island, are conveyed in small rivulets toward the middle, where they are emptied into four large basins.

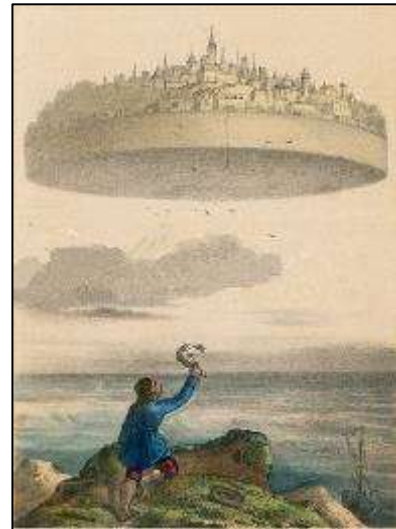
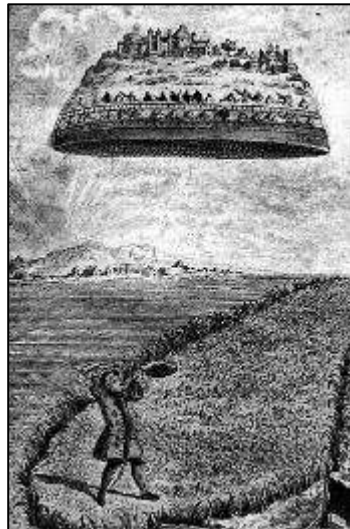
Should the Earthlings below fail to pay tributes, the Laputian King floats his domain over their heads, blocking the sun and rain and dropping stones for good measure.

Swift knew William Gilbert's On the Magnet, Magnetic Bodies, and that Great Magnet, the Earth (1600), a work which conflates magnetism (Chapter 20) and gravity into one force. Newton refuted the notion, but Swift tended to distrust Newton.

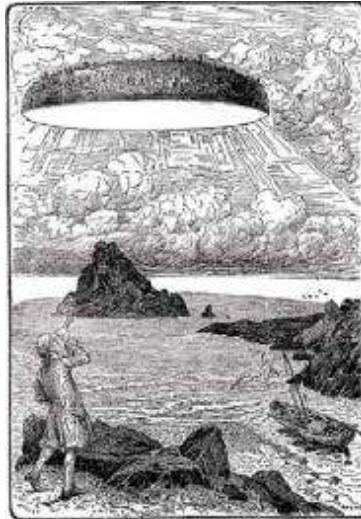
At the center of Laputa is firmly mounted a lodestone six yards in length and three yards in width, held in abeyance by the polarity of the Earth's surface and so well balanced that the weakest hand can turn island by rotating the lodestone up, down, or sideways, but only within the scope of Earth's magnetic field, which Swift estimates to be four miles. When the lodestone is horizontal, the up and down forces are equal and the island remains stationary.



Illustrations from early editions

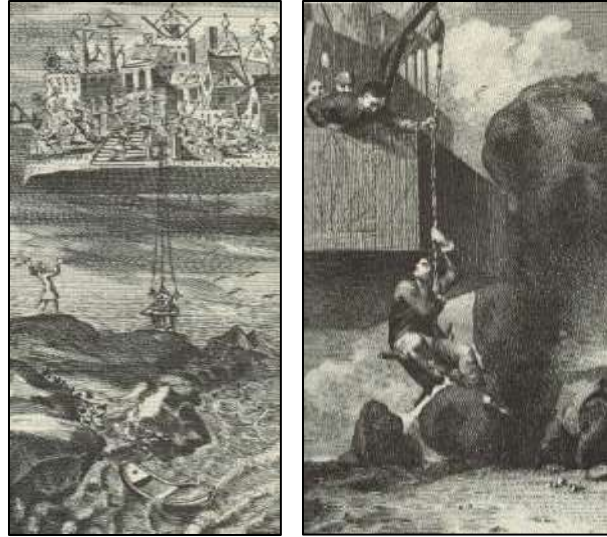


Chapter 81 -- Levitate It



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Ascending to the floating island of Laputa



Laputa is more than a rock in the air, of course, as noted in "Another FLOATING ISLAND," Pittsburgh Courier, September 13, 1941.

One of Jonathan Swift's most witty satires in that amazing book, "The Travels of Lemuel Gulliver," is the chapter entitled "A Voyage to Laputa." You will remember that Laputa was operated by a giant lodestone which enabled it not only to stay aloft but to move from place to place over the kingdom which it ruled.

Whenever there was an insurrection in a city or district, the FLOATING ISLAND was moved over the rebellious district and kept there, cutting the people off from sunlight, until they came to terms. American Negroes are not in insurrection, but their situation seems to be somewhat similar to the people described by Swift. Mr. Holloway has capably illustrated that position.

And let us quote from The Annotated Gulliver's Travels (1980), Isaac Asimov, ed.

From the satirical standpoint, [Laputa] is usually supposed to symbolize the court of Great Britain which, in terms of power and of social position, towered high above the rest of the kingdom.

It also symbolizes the world of science which involves itself in abstract thought high above the conventional interests of ordinary human beings.

Lodestone plays a part -- albeit erroneous -- in Nasrien's Turning Isle of Chapter 2.

Magnetism is of two varieties: ferromagnetism, which would include lodestones, and electromagnetism, the force field induced by electric current.

As for lodestone's levitation capability, Earnshaw's theorem states that a collection of point electrical charges cannot be maintained in a stable and stationary equilibrium configuration solely by the electrostatic interaction of the charges. A lodestone, or any other kind of ferromagnetic device, can't trump gravity.

Magnetic induction from a large current applied in proper configuration can indeed elevate objects small distances, a mag-lev train's superconducting magnets lifting the vehicle several millimeters off the track being an example. It is the passage of the train, however, that induces the upward force. In the far reaches of imaginable physics, perhaps, we could allow that a superconducting island having a cosmic-scale power supply and raced along the right sort of conduction track might rise, but even then, not high enough to include in a novel.

Orbit

A plethora of satellites orbit the Earth, so why couldn't a floating island do the same? To address this possibility, we'll need to know a bit about satellites. The orbital velocity of a satellite is,

$$v = \sqrt{\frac{G r_E}{r}}$$

where,

G is the gravitations constant,
 r_E is the radius of the Earth, 6378 kilometers, and
 r is the orbital radius.

In kilometers/second,

$$v = \frac{7.91}{\sqrt{r/r_E}}$$

For a satellite 640 kilometers above sea level, r/r_E is $(6378 + 640)/6378 = 1.10$, and v is 7.54 kilometers/second.

Orbital velocity is independent of the satellite mass and is not effected by rotation (or lack thereof) of either the Earth or the satellite about their respective axes. It will take 1.62 hours for our satellite to circumnavigate of a circle of radius 6378 + 640 kilometers.

A satellite is said to be synchronous if its rotational period is the same as that of its orbit. The same side if the satellite will always face the body being encircled. Our moon exemplifies such a case.

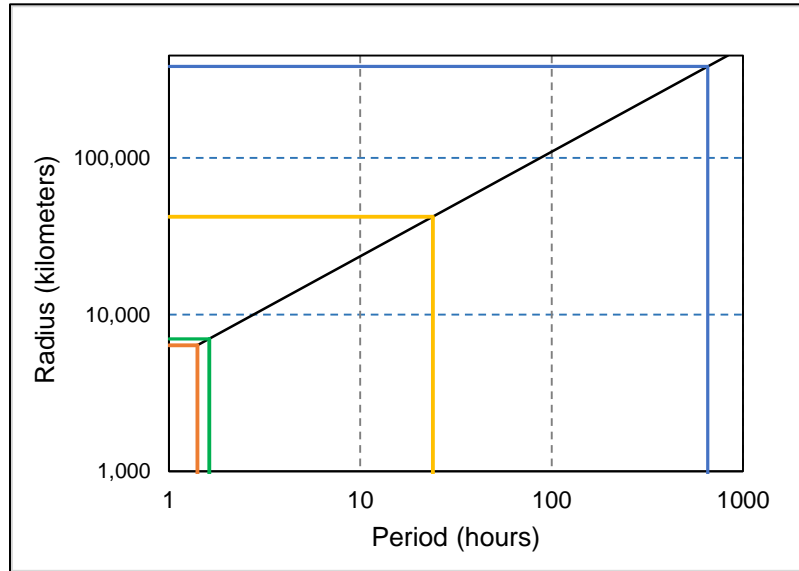
A geostationary satellite rotates about the same axis as that of the Earth with an orbital period equal to the rotation of the Earth. Such a satellite remains fixed at the same declination and hour angle from the perspective of an immobile observer on the Earth. Some communication satellites are both geostationary and geosynchronous. A small thruster can nudge the body a new location.

Substitute "sky island" for "satellite" and Newtonian physics thus might seem to account for the floating land masses abundant in science fiction and computer games. As with Newtonian applications earlier in this chapter, however, practical problems arise once we plug in the numbers. To remain over a particular spot on the Earth, i.e., to be geostationary, or close thereto, our island must float some 36,000 kilometers above us, roughly 1/10th the distance to the Moon, too distant to benefit from the Earth's atmosphere and too small of a mass to maintain its own.

Virtually all sky island artwork drawn from the perspective of the Earth's surface show detail that could be visible from no more than few kilometers, Gulliver pointing to Laputa as an example. Had Laputa been, say, 10 kilometers above him, Gulliver would have been pointing to an object whizzing by him at more than 7 kilometers/second. But even then, there's another problem. Air resistance within 200 kilometers of the Earth will quickly decelerate a satellite. At the pictured elevation, Gulliver's Laputa would have been in its flaming finale.

Summary

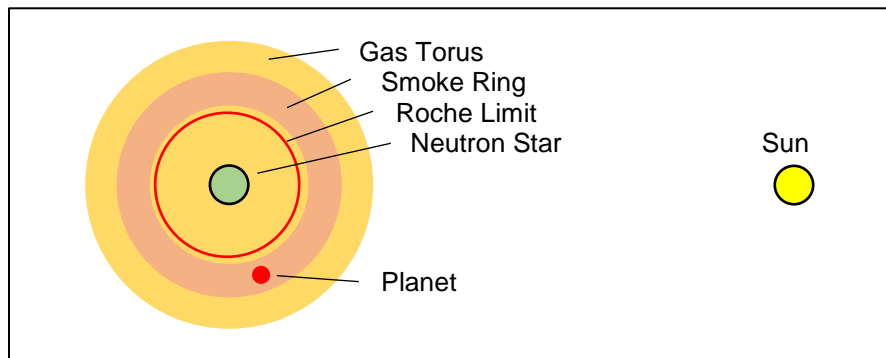
- Red 10 kilometers above Earth
 - Green Typical satellite
 - Yellow Geostationary satellite
 - Blue Moon
- Radius is from the Earth's center



To float an island in the sky takes more than the right orbit.

Smoke Ring

Ringworld in Larry Niven's Integral Trees orbits an old neutron star, which in turn orbits a sun-like star in a binary configuration. The Smoke Ring, a torus of gas encircling the neutron star, lies just outside the high-gravity neutron star's Roche limit, the distance within which a celestial body held together only by its own gravity will disintegrate due to a second celestial body's tidal forces being greater than the first body's gravitational self-attraction. Orbiting matter within the Roche limit disperses, while material outside coalesces. As a result, atmospheric gasses from the planet are pulled into orbit around the neutron star to form the Ring, most of which is too thin to be breathable. At the center of the torus, however, the atmosphere is thicker, capable of supporting life.



Ringworld is thus a star-circling ribbon. Shadows provide a day-night cycle, but when the sun is not shadowed, it's always directly overhead. The largest feature of the sky is the other side of the Ring.

Somehow -- and here we enter the plot -- the Ringworld became inhabited by primates and now there are dozens of species, both human-like and otherwise. The Ring contains globs of water -- aqueous floating islands, so to speak -- which float free like everything else. Aquatic and amphibious creatures live most of their lives in such ponds, but when their home pond drifts too far out into the torus, becomes too large and breaks up due to tidal forces, or impacts another object, the creatures thus must propel themselves through the atmosphere in search of new habitat.



Flora in the Smoke Ring tends to be fragile because it need not support its own weight. A notable exception to this rule are the eponymous Integral Trees which can grow up to 100 kilometers long. Tidal locking radially orients such trees with one end pointing toward the neutron star, the other toward space.

Each end of a tree sports a tuft, orbiting either too slowly (the "in" tuft) or too quickly (the "out"), compared to the atmosphere. The ends of the tree are thus subject to a constant gale-force wind causing them to curve into the shape of an integral symbol. ∫

The Ringworld concept with its aqueous floating islands withstands a degree of conceptually scrutiny in a scientific sense, but again comes to grief on the quantitative side. The neutron star, for example, is said to be about half of a solar mass, but when subjected to the equations of astrophysics, must be 5000 times yet smaller, implausible for such a body. Objects within the Ring would orbit the neutron star in less than 2 minutes, not 2 hours, as claimed. Other difficulties include the fact that an Integral Tree would in fact be pulled apart by differential orbital velocity. And any case, Ringworld would degenerate at any planar perturbation of its orbit.

But it's indeed a creative construction with some degree of embedded physics.

Odd Gravity

Sky islands abound in Wen Spencer's Endless Blue (2007). Discovering that his warp drive won't work is what convinces Mikhail that the world is not obeying the laws of normal physics. For the sake of a story, can we simply alter such laws?

Newton's law of gravitation states that two bodies attract each other with a force directly proportional to the product of their masses and inversely proportional to the square of the distance between them.

$$F = \frac{G m_1 m_2}{r^2}$$

where

- F is the attractive force between two bodies,
- m_1 is the mass of the first body,
- m_2 is the mass of the second body, and
- r is the distance between the centers of the masses.

The lunar mass is 1.2 percent of that of the Earth. Video of the Apollo mission has acquainted with the resultant gravitational force in which an astronaut can hop high, but isn't going to hop into space. On a sly island of less mass with proportionally-less gravitational attraction, hopping could be dangerous. Might we crank up G to augment the body's gravitational pull?

Or might we change the power of r in Newton's equation to something other than 2 to provide sky islanders with a workable gravity? Applying some sort of variable multiplier to the masses might be another way to balance things. Perhaps gravity could be either negligible depending on location.

The problem with revising a fundamental law to make one thing happen is that the change leads to other consequences. Increasing G , for example, might keep the sky islanders functional, but would puddle us if applied on Earth. Changing the exponent might keep the sly island in the sky, a very near object, say a pen, might push against our fingers with tons of force.

But numbers aside, the Newtonian force is toward the centroid from all directions, unlike most fictional sky islands where the pull seems to be only on the "topside."

What's "up" and what's "down" isn't a trivial issue. We want a gravity that both allows the island to float in space and at the same time, an islander to skateboard or swing in a manner akin to our experience on Earth.



The sky islands of the Dragon Hunters cartoon series range in size from those sufficient for a small farm to those sporting a good-sized landscape with stones floating over the surface. As there's but one "downward" direction, one can fall off an island and land on another. The idea's the same in Thomas Reid's The Empyrean Odyssey (2008), where a demon attempting to escape Mount Celestia falls off the side of a sky island and keeps falling through clouds below.



In the anime Unicorn Jelly, on the other hand, the "striation gravity" of Tryslmaistan space-time means that there is neither absolute up nor down. A secondary "reticutriational" force operates on the macro scale, inescapable to objects 100 kilometers in size.

Chapter 81 -- Levitate It

In Pokémon Platinum, the floating islands of Distortion World do not share the same gravitational orientation, important in surfing between islands.



In Dungeons & Dragons, the Elemental Plane of Air's "selective gravity" trait allows players to choose which way is "down" at any time.



The anime "Kukuburi" has flipside floating islands above and below of the mainland's equator's "gravity plane." To the right, an illustration.

In the video game Heart of Darkness -- no relation to Joseph Conrad's novel of the same name -- an upside-down mountain, home to the Amigos, floats above the world. The floating island has inverted gravity compared to the main land, such that if one fall from the mountain's edge, one goes into the sky. Upon reach the mountain's "top" (its bottom from a non-inverted viewpoint), one is claimed by the gravity of the Earth and fall down.



The Cities in Flight science fiction series (1950-62) by James Blish proposes a universe in which cities cast adrift from the Earth are powered by a fictitious Dillon-Wagoner Graviton Polarity Generator, a "spindizzy" which grows more efficient with the amount of mass being lifted. The concept is based on principles proposed by British physicist P.M.S. Blackett who sought to correlate the magnetic fields of large rotating bodies, bringing Newton's gravitational constant and Coulomb's constant together.

Blackett's effort was promptly disproved, but that's just for those who believe physics. Blish's extrapolation is that if rotation plus mass produces magnetism via gravity, then rotation plus magnetism produces anti-gravity. The spindizzy supposedly alternates the magnetic moment of any atom within its influence.

It seems that odd gravities aren't odd at all when it comes to sky islands.

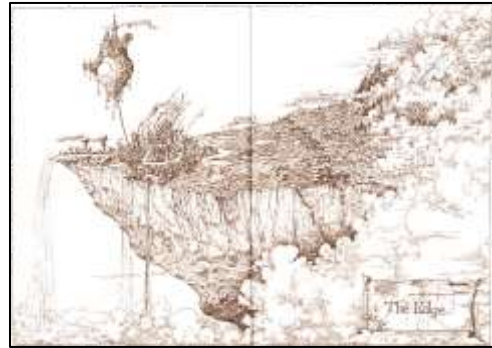
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Fictitious Materials

The floating city of Bhujerba in Final Fantasy XII floats due to its high quantity of a minable crystal called "magicite." The cartoon characters Rocky and Bullwinkle search for a mountain full of the anti-gravity metal "upsidaisium." The Three Worlds setting of the Books of the Raksura has islands buoyed up by magical rock. The floating city of Sanctaphrax in the Edge Chronicles is built on a floating rock that must be held down with a gigantic chain and a chest of "stormphrax."



The Edge Chronicles (1998) by Paul Stewart features a small city built on a floating rock, which in turn is anchored to a larger city built upon a far larger floating rock. The later has "gardens" of stones that mushroom large enough to themselves become lighter than air. Another theoretically possibility.



The mineral "Levistone" is cited to in several fantasies. It keeps a sky island of devious monkeys floating in the anime adaption, Kyouran Kazoku Nikki. In The Vision of Escaflowne, it's heated to decrease its levitation.

The gravity-negating "Nth metal" is likewise found in several comic book series. It allows a person wearing attire made of it to fly in Silver Scarab, Hawkman and Hawkgirl. Members of the Legion of Super Heroes wear "flight rings" made of an alloy of Nth metal called "valorium." In the Justice League animated series, Nth metal is transuranic iron with an atomic number of 676, hyperconductive and able to invert mesons and gravitons. In Batman, Nth metal is renamed "Nth Element" found within meteors.



In "The Floating Island of Madness," Astounding Stories, January 1933 by Jason Kirby, three Secret Service agents find an aerial island lifted "fleotite" above the Arabian Desert.

"Welcome to my floating island," he said gravely, never swerving those shiny eyes for an instant. "We have hoped long for your coming... During your stay here," he continued, "which I hope will be both long and profitable, you will become my slaves and will know me as Master.

"It has only substance," he said no weight whatever. This entire platform together with its huts is lighter than air. If I should tear loose this little door it would float out of my hands instantly and go straight up to the stars. The substance -- I have called it Fleotite -- is not only lighter than air but lighter than ether."



As far as an island's floating by virtue of its gravity-defiant composition, the only limit seems to be in naming the substance.

Antigravity Beams

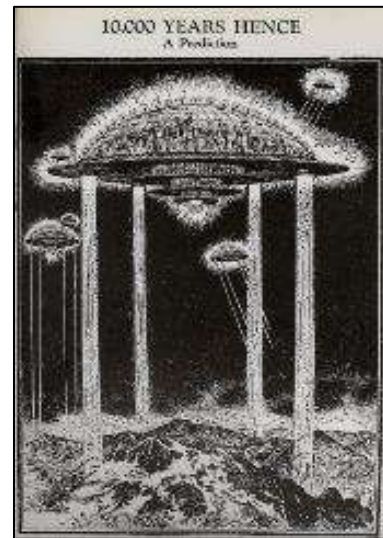
A great many sky islands operate as if they are perched on an invisible pillar. Such an arrangement provides the gravity needed for an Earth-like environment on the upper side.

But as no author wants his or her sky island sitting on a flagpole, however, how about something less substantial?

As conceived by Hugo Gernsback in Science and Invention, February 1922,

Four gigantic generators will shoot earthward electric rays which by reaction with the earth produce the force to keep the city aloft.

Note the four rays. According to ancient myth, Zeus attached the roaming island of Delos (Chapter 1) with four pillars of adamant to the center of the world, where it has remained firmly to this day.



Isaac Asimov's short story "Shah Guido G.," Marvel, November 1951, is about the tyrannical Secretary-General of the United Nations who rules the Earth from an island levitated by anti-gravitational beams. The ruler's downfall comes when it becomes known that the stations powering the sky island are approaching failure. The ruler is tricked into ordering his troops to quash a supposed rebellion and the weight of his force's cruisers overloads the levitation generators, causing the island to plummet.

In the role-playing game Hoshigami: Ruining Blue Earth, the world is a floating continent buoyed by an antigravity force that is progressively sapped as magic is expended.

Avatar (2009) is set on a world full of islands levitated by the Meissner effect, whatever that is.

Energy Fields

A few ideas from the internet:

A tangled energy field similar to the magnetic field of the sun could hold islands with different "charges" in different locations, essentially trapping islands in bubbles.

A black hole's gravitational force weakens quickly with distance. Islands could have a low mass black hole at the center, with an inner vacuum to prevent the island itself from being sucked inward.

Space between islands filled by a pressurized field of negative gravitational material might screen gravitational interaction between bodies. If each sphere of mass has a halo of negative mass, outside of the halo, one couldn't sense the sphere. Inside the halo, life feels normal.

Hyper-magnetism powered by a man-made star in the center of the island with a Dyson-grid around it to keep it intact.

A strong field caused by planar proximity of the elemental planes adds an additional attraction between massive objects. This adds a new gravitational multiplier, not a constant like Newton's, but based on the strength of the field.

A strong, but uneven, energy field opposes gravity, but only affects particular rocks. Massive rocks with a loose grid can float near the ground. Small rocks with a tight grid float at high altitudes. Rock with the most perfect grid can be used to create airships.

Techno-babble is can sound authoritative.

Catastrophe

Some sky islands are said to be of catastrophic origin.

Both the Rage of Mages and Spellforce series use the "long ago there was a cataclysm that shattered the world into floating islands, but a great force managed to prevent it from falling apart completely" backstory.

The video game Sacrifice features floating islands in a vast void, vaguely explained as "In the early days when the world was torn asunder terrible magical energies were released and blah blah blah..." It actually says the blahs.

The animated series Skyland takes place in the future when the world has been torn apart into a cluster of floating islands rotating around the Earth's previous core.

"How they came to be?" doesn't address "Why they remain?" but it seems to be enough for some stories.



The Myst Age of Spire consists of floating mountains orbiting around what seems to be a neutron star. When the core of the world became too magnetically active, the core pushed away the rest of the planet. Now the fragments' aggregate gravitational inward pull is in equilibrium with the magnetic push outward. Fortunately for a plot, the fragments have enough mass to keep an atmosphere. Myst III: Exile has lighter-than-air inflatable pods keeping chunks of vegetation afloat.



Magic

Some writers attribute their sky islands to magic.

Shattered World (1984) by J. Michael Reaves is set in a world of floating pieces of a former shattered planet surrounded by a sphere of breathable air, each with its own ecosphere and magically enhanced gravity. The islands are kept from crashing into each other by magical rune stones.





The eponymous The Kingdom beyond the Waves (2008), by Stephen Hunt has floating chunks of land broken apart by "floatquakes" due to uncontrolled magic.



The Floating Continent in Final Fantasy was levitated into the air by the magical power of the Warring Triad.

In the Shards setting of Dungeons & Dragons, floating islands generate the basics of life and floating in defiance of the dark void of the Beneath.

Skyrealms of Jorune, a role-playing game, has land masses levitated magically-charged embedded crystals.

The manga series In One Piece involves islands floating in the air due to Big Bad's Devil Fruit power.

"Panwapa," a television show from Sesame Workshop, takes place on a fictional island magically floating across Earth's oceans. Island residents visit with children from many lands and explore differing cultures. Panwapa is meant to symbolize globalization. The official description:

Panwapa Island is here but also everywhere, and its inhabitants are simply "of the earth."

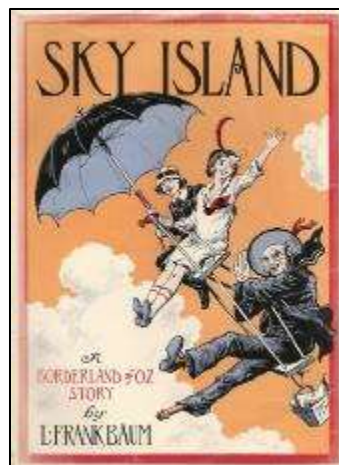


The above are no more magical than much of what came earlier garbed in pseudoscience, but the authors are forthright enough to call it magic.

In Name Only

We'll conclude our survey with a sky island in which its name provides a route into the plot, but not much to do with the subsequent story. As it's by a favorite author, we can hardly ignore it.

In L. Frank Baum's Sky Island (1912), Trot, her friend Button Bright and Cap'n Bill instruct their magic umbrella to fly them to a nearby island they call "Sky Island," because it looks to be "halfway in the sky," but the literalistic umbrella takes them to a true island in the sky, one divided in two halves, blue and pink with accordingly-colored races of beings.



It was a gradual descent. The Magic Umbrella maintained a uniform speed, swift and unfaltering, but its path through the heavens was now in the shape of an arch, as a flying arrow falls. The queer shapes of the clouds continued for some time... and after a while the umbrella dipped below this queer cloudland and entered a clear space where the sky was of an exquisite blue color.

"Oh, look!" called Cap'n Bill. "There's land below us."

The boy and girl leaned over and tried to see this land, but Cap'n Bill was also leaning over and his big body hid all that was just underneath them.

"Is it an island?" asked Trot, anxiously.

"Seems so," the old sailor replied. "The blue is around all one side of it an' a pink sunshine around the other side. There's a big cloud just over the middle; but I guess it's surely an island, Trot, an' bein' as it's in the sky, it's likely to be Sky Island."

"Then we shall land there," said the boy confidently. "I knew the umbrella couldn't make a mistake."

Presently Cap'n Bill spoke again.

"We're goin' down on the blue part o' the island," he said. "I can see trees, an' ponds, an' houses. Hold tight, Trot! Hold tight, Butt'n-Bright! I'm afeared we're a-goin' to bump somethin'!"

Everything they beheld was of the same blue color as the sky above. They seemed to have landed in a large garden, surrounded by a high wall of blue stone. The trees were all blue, the grass was blue, the flowers were blue and even the pebbles in the paths were blue. There were many handsomely carved benches and seats of blue wood scattered about the garden, and near them stood a fountain, made of blue marble, which shot lovely sprays of blue water into the blue air.

The dialogue proceeds to the other-world inhabitant refuting the ridiculous possibility of the visitors being from Earth.

"Your country!" exclaimed the Boolooroo, looking at them more carefully and seeming interested in their appearance. "Where in the Sky did you come from, then, and where is your country located?"

"We live on the Earth, when we're at home," replied the girl.

"The Earth? Nonsense! I've heard of the Earth, my child, but it isn't inhabited. No one can live there because it's just a round, cold, barren ball of mud and water," declared the Blueskin.

After Trot becomes both Queen of the Pinkies and "Booloorooess" of the Blues, she is able to regulate both societies into more sensible forms.

Conclusion

Sky islands tend to be explained by

- Conceptual physical principals, though not the computations,
- Pseudo-science,
- Magic, or
- Nothing.

As all of the approaches prove to be delusional, perhaps we're better to forget the "why?" and end with some art.



"Floating Island Fantasy"



"Island in the Air" by Primus Costa



A card by the Paizo community of gamers.

CHAPTER 82

ATTACK

It's a sad thing, islacide, but some floating islands should float no more.

It's Only in Self Defense.

Lest we seem belligerent, let us note that we're only being defensive in the matter.

Pliny the Elder (Chapter 32), Naturalis Historia remarks on the floating islands of some German rivers:

The shores are occupied by oaks that grow very eagerly, and when they are undermined by the waves or uprooted by the winds, they carry away with them vast islands in the embrace of their roots, and thus balanced, they float along standing upright, so that our fleets have often been terrified by the resemblance of their huge branches to ships' rigging, when as if on purpose they are driven by the waves against the bows of ships at anchor for the night, and the ships, in desperation, engage in a naval combat with trees.

In the flood of 1905, the Río de la Plata at Buenos Aires was covered with camalotes as far as the eye could see, some half a mile long and 100 feet wide, others just a few feet in diameter. These islands tore ships from their moorings.



Buenos Aires harbor

Steam Warfare in the Parana (1848), by Lauchlan Mackinnon, on the Rio Parana,

All the convoy and men of war, except the English steamers, started down the river to the last rendezvous, five miles above the batteries of San Lorenzo. One French merchant brig was, however, detained by a curious circumstance happening in the night. A large floating island or camalote came athwart her hawse, and drove her down some distance before she could succeed in disengaging herself. About ten a.m. another camalote of very large size, apparently two acres in extent, floated into the midst of us. Two of the vessels were obliged to shift their helms hard over and veer cable quickly, otherwise they would no doubt have been sent adrift. These islands are sometimes very compact, and capable of sustaining a considerable weight. There is a well-authenticated story of two tigers being drifted down upon a camalote as far as Monte Video, where the beasts created great alarm.

At one o'clock we weighed altogether, and ran rapidly down the river. We had hardly advanced twenty miles, before we perceived the unfortunate brig which had been entangled by the camalote the previous night, hard and fast on a bank. On boarding her, we discovered that she was abandoned by all, save a large French poodle, a monkey grinning at us from the main top, and several parrots chattering in the rigging.

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Charles Wilson and Robert Felkin's Uganda and the Egyptian Soudan (1882),

I dare say many would be surprised could they see the Nile as it flows into Lake No. From the deck of the steamer the river appears to be a channel varying from 100 yards to a mile in breadth, but on mounting to the masthead it would be seen that there is a sea of grass on either side of this water channel, and that the real banks of the river are four, eight, or even twelve miles distant on either side. Under all this grass is water, which is slowly but surely making its way down to fill up the vacancy caused by the absorption of the water by the sand and the sun in Egypt Proper.

The surface of the water is covered by a dense tangled mass of papyrus, ambatch, and other water-plants, which, in places, grow to a height of from fifteen to thirty feet, so that from the deck of the steamer nothing can be seen but water, grass, and blue sky.

Note: At the end of last year Gessi Pasha, while coming from the interior down the Bahr-el-Ghazel, with a steamer and four boats, was blocked near Lake No [Mahren-el Bohur]. They were enclosed for about three months, and 400 out of 500 men died from fever or starvation.

"Mr. Grenfell's Letter, A Floating Island," Missionary Herald, August 1, 1885, sent from Stanley Pool,

It was about eleven o'clock at night when I was awakened by the anchors dragging. (The strength of current and the numerous floating islands induced us to put down an extra anchor when we moored in the evening.) I immediately ran forward to see what was the matter. It was as I feared: a large floating island across our bows. Yesterday two men were carried over the Ntamo Falls in sight of us all on one of these floating islands.

I immediately gave orders to get up steam, and called all hands to try and push the island on one side that it might float by us ; but all our efforts were of no avail -- we were being steadily dragged down all the while. It was bad enough to feel the steamer quivering from stem to stern with the strain, but it would be far worse to be dragged under the overhanging trees across some great snag, or jammed on to the end of one of the many islands which stud this part of the river, for even when we got steam up, "full speed ahead" did not prevent us being carried along by the flood-borne mass of vegetation. If, as we tried to do, we could not push on one side this thousand square yards of floating grass and herbage, whose roots extended three feet or so into the water, we must cut it in two and so allow the halves to float by on either side.

We served out a dozen wood-cutting hatchets, and sent the crew on to the island to try and chop through it. They worked with a will, but made but very little impression on the tangled mass, which never ceased to carry us on. Something better must be done; hatchets would not get through by daylight, so we tried sharp knives, but with no better result. Then a happy idea struck to, "try the hand saws," and in about ten minutes a couple of them ran through the tough roots and stems, and we were free from our unwelcome companion that had dragged us a couple of miles, anchors and steam notwithstanding. We were soon under weigh again.

"Floating Islands, Homeless Wanderers on Great South American Rivers," New York Tribune, August 27, 1905, on the Río de la Plata and the Paraná following the great floods of that year,

The former have become a serious menace to navigation, and from the upper river come reports of vessels being dragged from their moorings by one or more of these masses being formed against them.

Richard Spruce, Notes of a Botanist on the Amazon & Andes (1908).

Sometimes the voyager finds refuge from a squall by forcing his canoe into the yielding mass of a grass-island, which breaks the shock of the waves, but when the river is rising rapidly, floating islands oblige the pilot to keep a sharp look-out, especially by night, and in the wet season no vessel anchors in the Amazon. The least evil that could result from such imprudence would be the dragging of her anchor by the onslaught of a Grass-island. From what has been said above of their bulk, and also taking into account that the winter current of the Amazon is at the rate of

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four or five miles per hour, some idea may be formed of the effect of their meeting a vessel stemming the stream, or even anchored in it, and there have been instances of vessels getting half-buried, and sometimes swamped in the floating mass.

"Strange Floating Island, Queer Freaks in Path of Navigation along Northern Pacific," Pittsburgh Press, December 24, 1905.

Captain Johnson, of the coasting steamer Capilano brought news of the floating islands to Vancouver today.

"I first saw one of these immense masses of flotsam last Thursday afternoon," said he, "as I was entering Smith Inlet, a well-known harbor just this side of Queen Charlotte Sound. I knew the channels there well, and I had just been called on deck, when I saw dead ahead a piece of land that I had never seen there before. I rubbed my eyes, and thought for a moment that the mate had brought us into the wrong inlet, but then I noticed some familiar landmarks and knew the bearings must be correct. Then it was a puzzle to account for this strange island.

"There it stood, 30 feet high above the water level. As nearly as I could judge its length was 300 yards and, as subsequently found it had a width of 150 yards. On nearing it I found that it was afloat, and was composed of immense logs, small boulders and trees, many of the latter standing upright as sentinels above the mass of timber. Had I gone in there in the night I might have struck the floating island. I have notified Captain Gaudin of the island, and the Government will probably take immediate action to destroy it.

The 120-foot steam ship Capilano built in 1891 and the first steamer from Vancouver to take part in the Klondike gold rush. She sank in the central Strait of Georgia in 1915.



"The Union Steamship Capilano"
by S.P. Judge, 1905

We're not informed on how, or even if, the government took action to destroy the menace, but we do know of a variety of possibilities. We'll span the spectrum, though only one or two would have been cost effective in the Queen Charlotte Sound.

"City Intelligence," Sacramento Daily Union, December 26, 1866, is a local story.

Two of the Steam Navigation Company's boats -- the Swallow and Flora -- have been moored for some time to a hulk on the Yolo side of the river, opposite J Street. A day or two ago the drift of the river commenced to lodge against them. With several trees as a foundation, brush -- and especially tule -- began to accumulate. Yesterday an immense mass of tule had collected. Small quantities were drawn under by the current and attached to the mass already there. The effect produced was the piling up, or rather raising up, of a large quantity of tule, which covered an area of perhaps half an acre, and loomed up above the water like a mammoth haystack. This material was drawn in under the prows of the two steamers, raising them out of the water. It was feared that the two steamers, the hulk and the floating island of tule would all be carried away together, in which case the steamers Queen City and Gem, moored just below would also be taken downstream. In such an event, great damage would of course have accrued to all the steamers named.

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Night was approaching and the flowing island was growing larger hourly. It was determined by the officers in command that the only thing remaining to be done was to cast off both steamers and the island and take the chances of segregating them in the stream. At about half-past four o'clock in the afternoon the experiment was tried. The steamers Lark and Victor were made fast to the nondescript craft and the entire fleet. The two steamers, with steam up, seemed unable to manage the others, except to guide them in the current. The entire craft passed rapidly down the river together, and in a short time disappeared around the bend, a mile and a half from the starting point. The floating island of tales appeared to still retain the advantage and to control the two steamers, which it had taken upon its back.

"20,000 in R. Nile Danger -- New Report," Monitor, August 3, 1998, Uganda

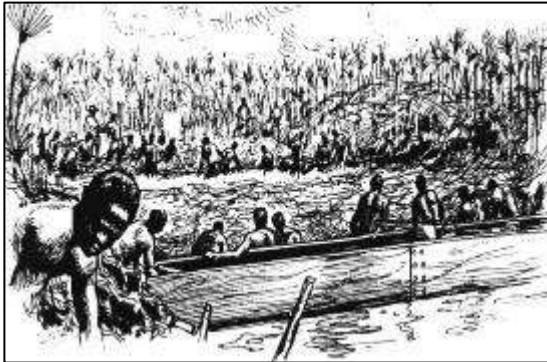
The huge land mass (sudd) which has blocked River Nile at its junction with Lake Kwania in Apac district, is 16 kms wide and 6 kms thick.

A report signed by Action Aid Emergency Officer, Muhammed Amanyia said the blockade, at the junction where the Nile flows into the upper Nile on its way to the Mediterranean Sea, has led to the flooding of sub-counties that border Lake Kwania.

We've made our case for preemptive annihilation. How then might we accomplish it?

Hacking

In the Botswana experience of the 1930s, whereas phragmites would quickly return after cutting, papyrus severed below water level did not and the channels remained clear. Standing in water to their waists or chests and working upstream, men with serrated knives on the end of wooden poles would cut the papyrus. The debris would be piled on the side with the help of a home-made derrick mounted on two steel boats.



Clearing the papyrus

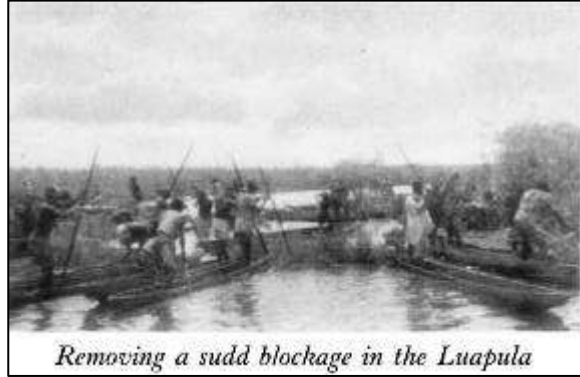


A few days later, a secondary obstruction of matted roots, etc., rises to the surface and must be removed.

William Brelsford, "Making an Outlet from Lake Bangweulu in Northern Rhodesia," Geographical Journal, July-August 1945, describes sudd management in the upper Luapula River

These blockages are formed by small floating papyrus islands that the rising water of the rains break from the lake edge swamp or from the swamps at the southern end of Mbawala island. Some are only tiny clumps, others are a few yards across, and the largest ones have been known to carry an unfortunate sheep. I have seen several with the relics of old fishing huts moving slowly down the river looking rather like primitive house-boats. The current of the upper Luapula rarely moves at more than 2 miles an hour, and when an island moves into the side it is easily stopped. The slight eddy brings, in time, another island and the quick-growing papyrus soon joins up to the papyrus river edge.

The blocks formed may stretch across even the widest sections of the river, sometimes 400 yards across, and the depth of the blockage may be as much as 30 or 40 yards. The river flows on underneath them, and since they give fairly easily to the weight of a man it is possible to drag canoes across them. Normally, when the water goes down they are broken from the more permanent bank and villagers hack at them to facilitate their own canoe passage, thus making a clear channel again.



Herbicides

Tussocks consisting of only non-woody vegetation can be eradicated by application of herbicides, after which mass disintegrates and sinks to the bottom.

Contact herbicides are lethal to all plant cells with which they come in contact. They act quickly and are relatively nonselective. This group of herbicides does not move extensively within the plant and may not kill internal plant tissues or roots. Perennial woody plants can be defoliated by contact herbicides but they quickly re-sprout and often must be treated again. Contact herbicides are more effective on annual herbaceous plants.

Systemic herbicides are absorbed into the plant and then move to other tissues. They act more slowly than contact herbicides but are usually more effective for controlling perennial and woody plants. Systemic herbicides are generally more selective than contact herbicides.

Following are chemical compounds approved for the control of floating vegetation in Florida waters.

Bispyribac is a systemic herbicide that arrests the production of amino acids necessary for plant growth.

Carfentrazone, a contact herbicide, is applied via foliar applications to control water lettuce and water hyacinth. It has low toxicity to fish and waterfowl.

Copper, often applied directly to water as blue copper sulfate crystals, can be used algae control. It is highly toxic to mollusks and fish at relatively low doses.

Diquat is a fast-acting contact herbicide used to control water hyacinth and water lettuce

Endothall is used to control submersed weeds.

Flumioxazin is a contact herbicide that causes chlorosis (yellowing) and necrosis (browning) of exposed plant tissue. Plants die as a result of the disruption of cell membranes.

Fluridone absorbed through the roots and shoots inhibits the synthesis of light-shielding carotenoid pigments, allowing ultraviolet light to destroy essential chlorophyll pigments.

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Glyphosate (ingredient of Roundup) is used to control a wide variety of annuals and perennials, broadleaf weeds and grasses, trees and certain floating plants. It does not control plants that have a majority of their leaves under water.



30 gallons, \$839.95

Sodium carbonate peroxyhydrate is used in aquatic systems for control of planktonic algae.

Imazamox inhibits an enzyme which regulates the production of essential amino acids.

Imazapyr is used to control herbaceous aquatic plants such as torpedograss and woody species.

Penoxsulam inhibits an enzyme which regulates the production of essential amino acids.

Triclopyr is effective for controlling immersed aquatic plants, some floating plants such as water hyacinth and some submersed aquatic weeds

2,4-D, the oldest organic herbicide registered in the United States for aquatic use, is a systemic herbicide absorbed by roots and leaves and accumulated in the growing points.

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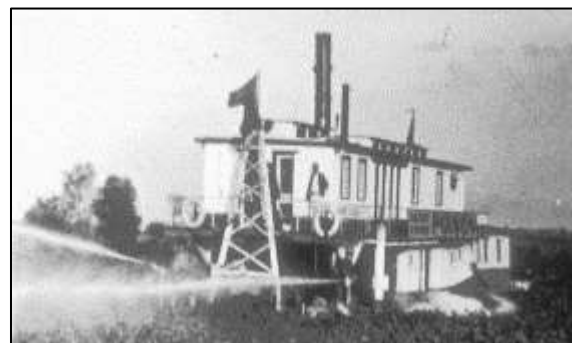
Effectivenesses.

Vegetation	Copper complexes	2,4-D	Diquat	Endothall	Fluridone	Glyphosate
Floating						
Bladderwort	P	P	E		E	
Duckweeds	P	G	G	P	E	P
Water hyacinth	P	E	E		P	G
Watermeal	P	P	P		G	P
Submersed						
Coontail	P	G	E	E	E	P
Egeria	P	P	G	F	E	P
Elodea	P		E	F	E	P
Watermilfoil	P	E	E	E	E	P
Fanwort	P	F	G	E	E	P
Hydrilla	F	P	G	G	E	P
Naiads	P	F	E	E	E	P
Emergent						
Alders	P	E	F	P	P	E
Alligatorweed	P	F	P	P	G	E
American lotus	P	E	P	P	F	G
Arrowhead	P	E	G	G		E
Buttonbush	P	E	F	P	P	G
Cattails	P	G	G	P	F	E
Common reed	P	P	P	P	P	G
Fragrant & white waterlily	P	E	P	P	E	E
Maidencane	P	P	F		F	E
Sedges and rushes	P	F	F	P	P	G
Spatterdock	P	E	P	P	E	E
Water primrose	P	E	F		F	E
Willows	P	E	F	P	P	E

Excellent control (90 to 100%)
 Good control (80 to 89%)
 Fair control (70 to 79%)
 Poor control (<70%)

E G F P

In the first half of the 20th Century, plant managers explored the use of chemical control methods, many of which were ineffective or toxic to non-target species.



A Florida operation, early 20th century

From "The Panama Canal's Aquatic Weed Problem," *Hyacinth Control Journal*, June 1966, by J.S. Hearne,

Even in 1913, while Gatun Lake was being formed by impounding the waters of the many rivers and streams behind Gatun Dam, it was evident that the water hyacinth had to be controlled.

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Chapter 82 -- Attack

The destruction of the water hyacinth in the Canal, Gatun Lake and its tributaries was begun in March 1914.

An outfit consisting of a 30 foot steam launch, a pump boat and a quarter boat was used. The launch was used to supply steam to the pump boat and for towing and transportation of men and supplies.

The arsenic solution used was made up of arsenic, soda and water in proportions of one pound of arsenic, one pound of soda and 18 gallons of water. This mixture was most effective, killing the hyacinth and most everything else that got in the way. This mixture was used until 1935. A solution of copper sulfate and water was used as a spray from 1935 to 1952. The use of 2,4-D was started in 1948 and is still being used today.



Tussock management using herbicides costs in the \$150-200 per acre (2010) range.



Simply killing the vegetation on floating islands with roots interwoven into peat and mud, however, will not eliminate the islands, as mud, peat and woody material continues to float and the cycle repeats. The cost of dismemberment and/or removal of such islands can be more than an order of magnitude greater than that of herbicidal treatment.

We'll begin with the most dramatic.

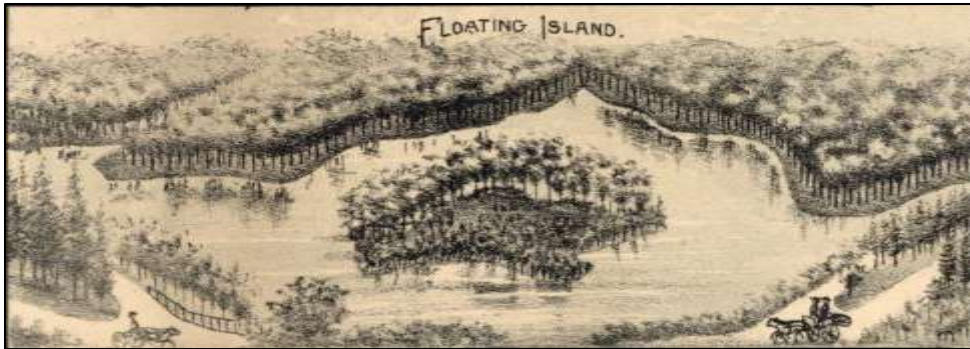
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Dynamite



A few outcomes,

1. Lonsdale, Rhode Island, 1888



"The Infamous Floating Island of Lonsdale," Old Rhode Island, September 1994, by Mildred Laxton Kelley, is Rhode Island history.

It was a phenomenon of nature, an island that meandered at will, back and forth between Scott's Pond and Cranberry Pond until it grew too big for its own good and caused its own demise. For untold years it floated around, this mass of live grasses, shrubs, and trees, sometimes nestled against the Lower Road shore as though resting, sometimes against the wooded hill shore opposite, but mostly just gliding around.

Local folks proudly brought visitors to view this wandering island, clearly visible from many points along the shores, especially from the Narrows where Lonsdale Avenue takes a deep dip a short distance past the Lonsdale Baptist Church, before the road starts to climb again toward Saylesville. There one could stand near Cranberry Pond and watch the capricious island gently approach and recede. Guests were told that there were only two such islands in the country.

Daredevil boys thought it fun to swim from side to side under the island, jumping off one side and coming up under the other, a death-defying challenge with no thought of becoming entangled in waving roots and debris. Young ladies of that time did not engage in such activities—they simply applauded from the shore.

Water from the ponds as well as from the Blackstone River and Canal was essential to Lonsdale Company's Lincoln Bleachery operation, so when the island grew too large and floated to a narrow opening slowing the water flow, the problem at first seemed solvable by fastening the island with heavy chains to a large tree on land. But it was not that easy. The strong island broke the chains time and again and continued to float. More than once it uprooted a tree and sailed away free.

The worst possible solution was finally suggested -- destroy the floating island, local source of wonder and pride. The Lincoln Bleachery could not operate on sentiment.

And so the floating island had to be blown to bits with dynamite and the pieces hauled away.

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Scotts Pond 1911 Postcard

Floating island next to the shore



2. "Floating Islands of Tree Stumps and Roots Bedevil Residents along Connecticut's Candlewood Lake," New York Times, November 15, 1965,

Eight sticks of dynamite were embedded into the soggy mass, three to four feet thick in some places.

They were set off simultaneously. Debris shot into the air and the nearby Berkshire Hills reverberated with the noise of the explosion. However the island remained practically intact.



Destruction team preparing to dynamite a floating island of bottom muck and roots in Candlewood Lake, off Brookfield, Conn. Explosion left island almost completely intact.

"Seeing Wonders in Connecticut," New York Sun, August 11, 1934, is about this lake.

When Tom Beck extends himself, Connecticut forgets about Barnum. The chairman of the Connecticut Board of Fisheries and Game was only half trying yesterday, because of the heat. Yet he managed to unfold a sight of floating islands.

"This lake," explained Commissioner Beck, "was artificially constructed by the Connecticut Power and Light Company about fifteen or twenty years ago. Underbrush came to the surface. Twigs and vegetation entwined, and picked up more vegetation. The result are these floating islands."

The interesting part, however, is the reporter's impression

A floating island is just a floating island and looks like any other island.

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To attack a floating island, one must first identify it.

3. River of Lakes: A Journey on Florida's St. Johns River (2000) by Bill Belleville.

The river channel north of the lake here was once full of little floating islands -- bothersome "jams" of mud and weed. By the early 1950s, it had become for all practical purposes non-navigable. Local boaters, who were discovering the newly available joys of having outboard motors whisk them quickly wherever they wanted to go, took matters into their own hands; they dynamited the little floating islands to smithereens. Lake Washington, which had come to depend on the jams for its existence, promptly drained itself downriver.

4. "Sailboat Islands," Ocala Star-Banner, August 7, 1955, Orange Lake, Florida, about Don McKay (Chapter 65

Once, while clearing out the mouth of Cross Creek -- made famous by the book of Marjorie Kinnan Rawlings -- he was completely hemmed in by newborn Islands. A stick of dynamite used by McKay had loosened a wide area of lily roots and mud, and it took him hours to saw through a hundred yards of the floating mass.

"Lake of the Floating Islands," North with the Spring (1951) by Edwin Way Teale, the same story with a few different details

McKay once saw half a dozen floating islands pop up to the surface almost at the same instant. He was clearing a channel near the mouth of Cross Creek, at the northern end of Orange Lake. A stick of dynamite, detonated on the lake bottom, jarred loose rafts of spatterdock roots over a considerable area.

5. During the building of the Panama Canal, the construction of Gatun Dam flooded the swampy area of the Chagres River, causing loose vegetable matter, small trees, logs and branches to drift about as tangled masses upon which plants began to grow. Eventually these derelict islands formed a menace to navigation and had to be dynamited.
6. InterPress Third World News Agency, January 10, 1995, takes us to South America.

Paraguay and Argentina said they may dynamite several small floating islands, more than a hectare in size, that are now threatening to damage the same dam that caused them to break loose. The land masses, which broke off from the land inundated by the reservoir between Ayolas, Paraguay and Ituzaingo, Argentina, have already caused U.S. \$160,000 in losses to the Yacyreta hydroelectric power station after forcing the turbines to close down for two hours.

7. "The Tariuni Lake in Fiji," Geographical Magazine, March 1, 1876, by E.A. Liardet,

A short, muddy walk now brought us to the foot of the basin, which is undoubtedly the crater of an extinct volcano. But, alas, we saw no lake, only the surrounding hills, and in front of us, rushes. We judged the basin to be about a mile and a quarter in length, and three quarters of a mile in breadth, of oval form

Our guide showed us a point of land some half a mile off, and by force of expression undoubtedly conveyed to us as plainly as so many words, "There you are." Clay started off to show us the way, and suddenly disappeared. On coming up he said he thought it must be swampy, and so we indeed found it, natives and all. One would go down to the waist as another came up, drenched and covered with the vegetable matter of which our ground-work consisted, and which was merely a floating island. Only ankle deep one minute and suddenly immersed to the waist the next, is really no joke.

It was just like going over ever so many deep and narrow ditches, which one could not see. The narrow channels separating the islands had a width of only from 2 to 3 feet, the water was very clear, and we ascertained the depth of the islands below the surface to be about 6 feet.

At last we came upon the scene, and to confess the truth were sadly disappointed. The sheet of water was smaller than we had expected to find it; no birds were to be seen, and a charge of dynamite, expressly brought up, was exploded in the water without any result.

8. Mandrake the Magician, October 19, 1940



Artillery

As recorded in the Dictionary of American Naval Fighting Ships (1959-91), a destroyer sunk an unfortunate floating island in May, 1945.

She departed Tawi and headed southwest to escort ATR-64 and her tows -- a PT boat dry dock and gasoline barge -- to Tarakae, Borneo. Late in the afternoon she sighted and partially destroyed, as a menace to navigation, a floating island complete with palm trees and other plants.



World War II was still being waged in the area.

Hand Sawing

"Scenes in Africa" Christian Union, August 13, 1885, describes passage up the Congo.

During the voyage, Mr. Grenfell and his companions were in considerable peril from the presence of a large floating island, "one -thousand square yards of floating grass and herbage, whose roots extended three feet or so in the water." A passage had to be made through it by hand-saw.

Two accounts regarding naturalist Dan McKay parting matted water hyacinths of Orange Lake with a with six-foot timber saw:

"One-Man Nature Center," Nature Magazine, February, 1948, by Edwin Way Teale

How thick are these floating land-rafts of Orange Lake? The average is put at between two and three feet, with a few having a thickness of five feet. This makes possible one of the strangest operations on record-sawing an island in two. On board his boat, McKay always carries a long cross-cut saw.

Twice he has had to use it to free himself when drifting islands hemmed him in. A few years ago, he was clearing out the mouth of Cross Creek -- made famous by the book of his friend and neighbor Marjorie Kinnan Rawlings -- where it empties into Orange Lake. A stick of dynamite loosened masses of spatterdock roots and new-born floating islands popped to the surface all around him. Before he could start for home that afternoon, he had to saw through more than a hundred yards of roots and soil. He and a helper sawed away for hours before they freed the boat.

"Lake of the Floating Islands," North with the Spring (1951), Edwin Way Teale. Each island is

McKay carries a long crosscut saw on board. Twice he has had to saw through a small island to release his boat. The thickness of the land rafts ranges from two to five feet. Black and peaty, the wet mud stings like fire when it touches the skin in summertime.

On several occasions McKay has tried anchoring down small land rafts with cables and concrete blocks. The result is always the same. In the first storm the cables tear away. Once he carried the steel cable over the whole top of the island and anchored it on either side. As soon as the waves began rocking the land raft the cable sawed it in two, slicing downward with the ease of a wire cutting through cheese.



Don McKay, saw in hand

A South Carolina report from "Floating Island Lose Out at Goose Creek," Charleston News and Courier, April 13, 1952,

A catwalk plank frame, which is raised by block and tackle while the craft is underway, is then lowered to form the support for workmen. This frame has a crosspiece and thus forms a walkway enclosing an area some 15 feet square.

Workmen with saws then go out on the catwalk, sawing through the island as they go. Then, like a cake, they slice this into sections. Other workmen on the barge use two-pronged "hoes" to pull the sections of the island into the pan.

The saw will be needed. The islands are growing along the sides of Goose Creek and have grown all the way across the reservoir about a half mile north of the pumping station.

Further distant, "The Floating Islands of Rawa Pening," PANS, 15:2 (1969) by E.C.S. Little, describes the assault on mats 2 meters thick.

The local people have devised an ingenious system of cutting suitable sized portions off these islands with long saws. The pieces are then assembled into rafts, about 70 m long x 6 m wide, by binding them together with thin strips of bamboo. The workers, using long poles, can push the islands several kilometers across the lake. Canoes placed on the islands give a firm stance to the polers. The mass of vegetation is usually discharged to waste over the spillway in a surge of released water after opening the sluice gates of the lake. Consideration was being given, instead, to utilizing all this material for agriculture. This would only be practicable after a proposed dyke had been built round the lake which would provide convenient points at which the material could be lifted out and deposited on dry ground.



Sawing an island of aquatic plants in Rawa Pening Lake and poling it to the spillway

Mechanical Sawing

Four reports, each from a different decade, on the on the cutting up of the floating islands at Higley Power Station, Raquette River, New York

1. "Last of Raquette River Floating Isles Cut into Cubes and Sent to its Doom," Syracuse Herald Journal, June 12, 1943,

An 11-Acre Floating Island in the Raquette River goes over a darn of the Central New York Power Corporation near Potsdam, after having been cut into 16 sections. The island was the last of 20 removed from the river because they blocked boat houses and seeped into the power company's intake. How the islands got into the river never has been definitely determined.

The large island, from one to 12 feet thick, was too cumbersome to go through the narrows and too thick to go over the dam in one piece. So last winter the company moored it to the shore and let it freeze.

Using a power driven ice-saw, workers cut me frozen mass in sections. They were attached to cables to the shore with the use of "deadmen," logs driven through the ice vertically, then twisted into a horizontal position.

The sections finally were pushed out into the stream by motor boats and, one by one, floated over the dam where they broke up on the rocks.

A photo of the breaking up

According to power company legend, one of the islands was sunk when "Big Moose" Fed Gabber, a rigger-foreman weighing nearly 300 pounds, stepped on it.



2. "Fairman Confesses an Error and Recalls How the Floating Islands Floated Away," Syracuse Herald-Journal, June 3, 1952,

The sawing process took nearly four months, from December, 1942, to March, 1943. Then, after the passage of spring floods on the Raquette River, the removal process was begun on May 1, 1943, and completed in just a little less than one month.

In removing then last of the floating islands, it was cut into 16 sections, each one small enough to make possible their plunging over the dam when loosened. The sections were

approximately 150 feet square and varied in thickness and weight from 3-1/2 feet, 2,500-ton sizes to a maximum of 14 feet, 8,100-ton chunk, cut from the center of the island.

3. "The Unusual Case of the Floating Island," Niagara Mohawk News, May 1976

Niagara Mohawk tried many ways of disposing of them. They wouldn't bum, even when saturated with oil or gasoline. They couldn't be sunk or anchored with rocks, which simply went through them. Even dynamite had little effect on the spongy masses.

A string of stone-filled crib piers was built across the mouth of the bay and a log chain strung between them. This kept the islands in the bay, but that was exactly where the campers didn't want them.

The project turned into a duel. The chain would be cut at night, and crews would repair it the following morning. Meanwhile, another piece of island would have gone into the plant intake. This part of the job ended in victory for the campers, someone stole the entire log chem. Another solution had to be found.

It came from polling the ideas of the men who had been in charge of most of the work. They determined that the islands had to be cut into sections small enough to remove.

Pulling them apart with steel cable didn't work, and they couldn't be pulled apart with knives. But it developed that they could be sawed when they were frozen.

With modification to the "set" of the teeth, special ice saws eight feet long were made for the job.

4. "Historian Recalls 'Floating Islands of Higley Flow,'" Syracuse Herald Journal, December 13, 1981, describes outboard motors attempting to push a portion of a floating island into main current while trucks on shore reeled in cables attached to the islands.

The island stubbornly resisted efforts to blow it up or burn it, and as a last resort the crew -- headed by Big Moose Gabbert -- decided to try cutting it apart.



It sounded far-fetched, and there must have been those back in 1942 who thought the utility workers had taken leave of their senses when they marched onto the frozen island armed with power saws. But it worked.

And while we're at Raquette, we can't fail to include "Last Floating Island Gone," Rome Daily Sentinel, May 15 1943, for its dry wit.

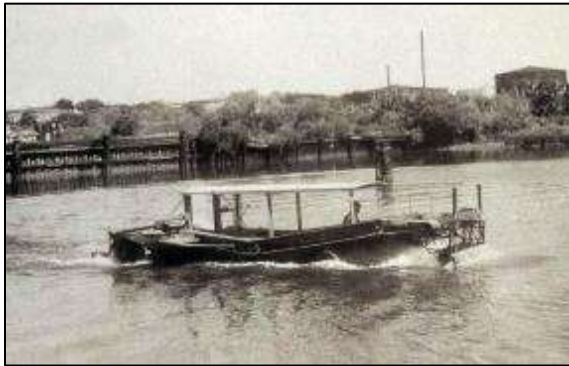
We are told me islands were originally peat bogs around ponds which formed during a glacial period about 15,000 years ago.

It is interesting to have the age of 15,000 years placed upon those of the Raquette River: but no claim is made in the news report that there is any notation to that effect on the records of vital statistics in the town of Colton or elsewhere in the Adirondack region.

Reference to gang saw boats severing aquatic plants a few feet below the water surface can be found in George Reid's "Some Considerations and Problems in the Ecology of Floating Islands." Quarterly Journal of the Florida Academy of Science 15:1 (1952).

Something over a million dollars has been spent to control this pest: the Government uses small launches equipped with circular saws, which cut up these roots so that the plants may float out to sea or be hauled ashore.

A few Florida saw boat pictures,



Tractors

"Floating Island on Spirit Lake Torn to Pieces," [Rib Lake Herald](#), May 19, 1960, in which floating piece of muskeg broke off from a Wisconsin lakeshore swamp and was blown to the lake outlet.

The floating island, which was raising the level of Spirit Lake, was successfully conquered by members of the Rib Lake Fish & Game Association in two work-bees - last Thursday and again Tuesday night of this week. Ted Dietzler, chairman of the project, reported that the entire mass, composed of a bog, alders, and other types of vegetation, has been torn apart, and most of the pieces floated over the dam and on down the Spirit River. A few chunks remained on the nearby shores. More than 20 sportsmen were on hand for the first day last week, and were assisted in tearing the island apart by tractors donated by Allen Hanke and Herb Magnuson, and a large truck equipped with a winch, donated by Louis Heiser. Nearby resort owners loaned boats and helped on the project. The crew of about 12 completed the work Tuesday night. The nearby dam is owned by the Town of Spirit, which is making plans for further improvements, including a public boat landing."

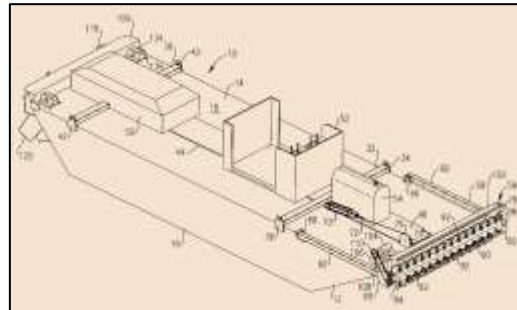
Shredding

Shredders use rotating blades to chop aquatic vegetation including trees up to 10 inches in diameter and other organic material finely enough to quickly sink and decompose, or coarsely enough to float and be harvested from the surface.

Shredders need 2 or more feet of water depth to be most effective. Depending on vegetation, shredders can dismantle up to 10 acres of floating islands per day.



U.S. patent 6189303 (2001) -- Method of destroying aquatic vegetation. The shredder includes a double hull watercraft with a shredding assembly adjacent the bow.



Floating island and shredder caught in flood control structure on Lake Hancock, Florida.



Crushing

Unlike shredders, the crusher boats, "Kennys," used through the 1940s, hauled plants aboard, crushed them and discharged the product to the water

"Hi-baller" crusher boats used a water-cannon to fire the plant slurry to the shore.



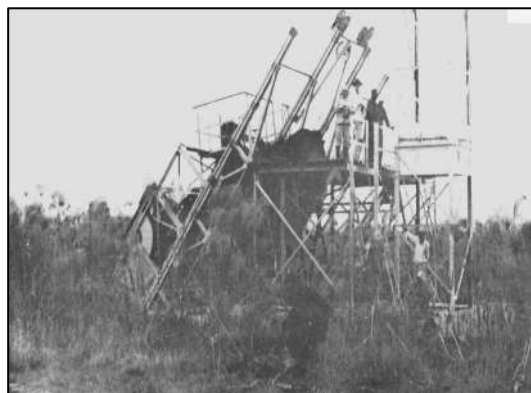
Harvesting

The 1950 Development Scheme for Bechuanaland provided consultant W.G. Brind the wherewithal to conceive, design, and have built a papyrus cutting machine. The 24-wide wide contraption was winched by hand on six pontoons. Power-driven reciprocating cutters were lowered into the floating mat to sever a strip in three portions, each 8 feet wide. When the cutters were raised, the cuttings were drawn up a ramp and thrown to the side.

The machine weighed 45 tons and drew 4 feet of water. It was fabricated in South Africa and assembled at Gumare in early 1953.



On trial, 1953. The cutters have been lowered.



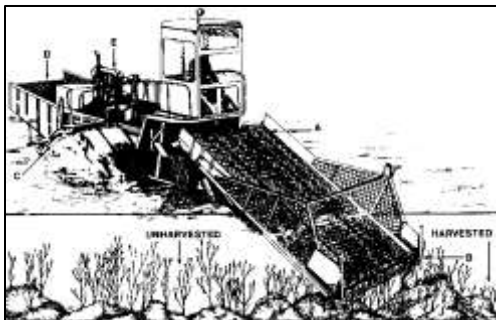
Carriage in half way position, ready to descend for second cut. In the interval between the two pictures, the carriage, with its load of cut papyrus, was raised and discharged its load.

Start-up troubles ensued, and people spoke flippantly of "Brind's merry-go-round," but the required alternations were surmountable. The machine was to be modified and three additional machines, somewhat lighter, were to be built. Ninety-seven miles of blockage, two million tons, were to be cleared in three years.

But by 1956, development priorities had shifted and the High Commissioner ordered that that Brind's "machinery will be maintained in proper condition." But without further funding, it floated unused and unserviceable. Pressure began to have the machine removed from Gumare. It was dismantled in 1957 and the parts put to other uses.

Today's commercially-marketed aquatic weed harvesters sever buoyant vegetation from the bed, remove it from the water with a conveyor system, store the product and transport it to disposal sites. Such vehicles are typically in the 2 to 4-meter swath range with carrying capacity between 4

and 15 tons. Harvesters tend to be designed for matted vegetation, not islands, but equipment at the heavier end can be used to nibble away substantial biomasses. High capacity harvesters can remove approximately one acre of dense floating vegetation per day.



A saga of harvesting, "Cleaning Orange Lake Yields Scant Results," [Gainesville Sun](#), February 25, 2014,

A thick, hundred-acre mix of floating mud, soil and decaying vegetation marks the border of where aquatic harvesters are scooping up floating muck on Orange Lake. The work will go on for the next two months and it will barely make a dent.

The nearly 13,000-acre Orange Lake is on the Marion-Alachua border. The tussocks on the southern tip have gone undisturbed long enough for hundreds of willow and red maple trees to have taken root, reaching more than six feet in height.

The harvesters, powered by paddles, lumber like dinosaurs along the water's surface, taking bites out of vegetative mass near the shore.

"It's all a result of time and no maintenance," said Mike Hulon, operations manager of Texas Aquatic Harvesting Inc., based in Lake Wales.

The company has hauled in three of its largest harvesters: one nearly 90 feet long and 16 feet wide and two others 70 feet long and 14 feet wide. The former is able to scoop 48,000 pounds of wet muck before heading for shore and unloading. The two smaller harvesters scoop 24,000 pounds each.

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The harvesters push their way into the floating tussocks and, with a rolling bar, take bites of vegetation and pull it onboard. When the boats can hold no more, they paddle their way to shore and use the same rolling bar to push the vegetation onto awaiting dump trucks, which haul it to an area landowner willing to take the muck for fertilizer.

Texas Aquatic will clear out the same 50 acres it did nine years ago. No one has gone in to clear the lake since.

The 90-foot harvester can clear about 0.43 acres per day. The 70-foot harvesters clear about 0.2 acres a day. The company charges about \$225 per hour per craft, but adjusts its price based on the amount of work offered, Hulon said.

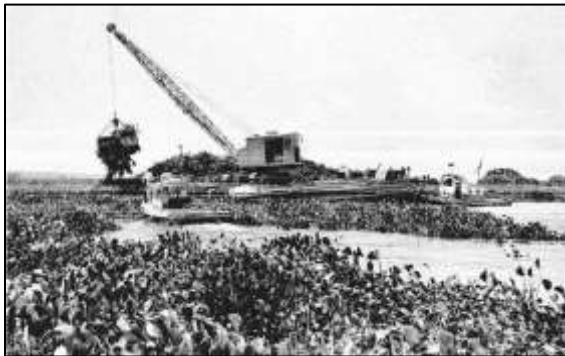
The tussocks often move based on the way the winds blow, Hulon said. That makes the job more difficult because an area just cleared could become congested with the vegetation if the winds send them the wrong way.

Rakes, Track Hoes, Draglines, Excavators, Derricks and Grapples

Draglines use a cable system to cast and drag a shovel that collects plants and organic material. Track hoes have claw shovels that can reach 25-30 feet over the waterbody, dig down, and pull plants back to shore.



1916 and 1923





Charleston, South Carolina, provides a case study for raking up floating islands

The area of Charleston's reservoir had formerly been the site of rice fields, which after abandonment had become a closely-interwoven 2 to 3-foot rooted mat of alligator weed, which once the creek was dammed, threatened to cover the entire water surface.



1918 and Today

Willows, cypress and pine trees acting as sails would sometimes carry a broken-free island mat against the DAM'S spillway, a contributory causes of the 1916 overtopping of the embankment. in 1921, THE CITY began the removal of some 50 acres -- a number which would grow -- of these islands.

"Ridding Reservoirs of Floating Islands. How the Charleston Water Department Met the Problem and Removed Masses of Floating Plant Growths from Water Supply," Fire and Water Engineering, September 6, 1922, by J.E. Gibson, summarizes the endeavor.

Description of Equipment

The equipment consisted of two 8-ft x 16-ft x 3 ft. draft lighters lashed together, upon which was mounted a double-drum Clyde hoisting engine and boiler. At the stern of the lighters a gallows frame and mast were erected. Two 10-in. x 10-in. spuds were also provided at this end and used to anchor and hold the lighters in position.



Extending from the mast on the lighter to a mast ashore, was a conveyor or trolley cable. From one of the hoisting engine drums a 3/4-in. cable was passed around a pulley block fastened about half way up the shore mast and the end fastened to the rake. This rake was made up of angle and railroad iron about six feet in width. The teeth were railroad iron about 4 1/2-ft. long, projecting about twenty inches below the yoke or rake frame. The upper end of the rake teeth were braced forward to the yoke of the rake to prevent the straightening out of the teeth and yoke when a strain was placed on the teeth. This rake was supported by proper tackle from the trolley cable, and a second line was fastened to the rear end of the rake and passed back to the second drum of the hoisting engine.

Process of Removal of Sections of Island

The process of removal is to tow the islands into position in front of the lighter by means of manila ropes over the spools of the hoisting engine, when the rake is lifted forward, that is, toward the lighter, and placed in a position to engage as large a section of the island as our judgment and experience dictates can be satisfactorily handled with the engine. The engine drum is then started and this portion of the island is then pulled up on the shore. The rake is then returned to position for another "bite" by the cable on the second drum of the engine and the overhead trolley cable, when the operation is repeated. The entire process resembled the operations of a drag line scraper with the rake taking the place of the scraper. When all of the island material that could be economically handled at any one point is in place, the equipment is moved to a new location and the work is continued.



Floating islands in spillway before work was commenced



Rake being returned to position and rake pulling a portion of an island ashore



Floating islands before work was commenced



After removal of 300 acres of islands from viewpoints of prior photos

Some Lessons Learned by Experience

We found that in many cases where we removed the islands that had been anchored in shallow places in the reservoir, that the original marsh would float to the surface. The explanation of this is, that the superimposed weight of the anchored island kept the under-mattress of roots from floating. This second, or submerged island is much more difficult to handle, in that the roots have partially decomposed and the rake would tear the island apart; while in the case of the floating islands with live vegetation, the roots were of sufficient strength to hold the mass together. In handling the mud and disintegrated islands we found it very advantageous to do the work in alternate sections, that is, we would rake up the disintegrated island and mud first, then finish with the islands on which was growing vegetation. By these means, the growing vegetation acted as a broom and swept up the mud and disintegrated material.

That the project's cost breakdown merited publication in both this journal and in Engineering and Contracting, September 13, 1922, speaks to the interest of others.

Chapter 82 -- Attack

<i>Cost of Equipment -- Lighters</i>	
Materials	\$399.15
Labor	481.25
Overhead	73.20
Misc. small tools and cartage	21.20
Labor framing gallows frame and spuds	<u>43.05</u>
	\$1,017.85
<i>Miscellaneous Equipment:</i>	
Two 16-ft. bateaux	\$43.00
Painting and cartage	13.95
Oars, push poles and labor	28.89
Anchor	<u>9.18</u>
	\$95.02
<i>Rake</i>	
Material and labor making rake	\$221.67
Log chain, angle iron and cartage	<u>23.10</u>
	\$ 244.77
<i>Cost of Placing Hoisting Engines Aboard. Lighters:</i>	
Labor	\$22.65
Labor fitting up boiler equipment, coal bin, etc.	<u>33.50</u>
	\$56.15
<i>Total cost of equipment</i>	\$1,413.79
<i>Cost of removal of islands:</i>	
Repairs to machinery and equipment	\$91.65
Rope and other small materials used during prosecution of the work	360.53
Coal, oil, waste and incidental expenses for hoisting engine	626.40
Common labor	7,792.06
Rental of hoisting engine— 12 months	1,200.00
Supervision, general superintendent	2,357.50
Cartage of materials, etc.	174.00
Overhead, exclusive of engineering	769.50
Engineering	<u>50.00</u>
<i>Total cost of work, exclusive of equipment</i>	\$13,421.64
<i>Total cost of work, including equipment</i>	\$14,835.43
<i>It is seen therefore that the cost of the work per unit of area, based on the removal of 350 acres of islands to July 31, 1921, is:</i>	
For equipment	\$ 4.04
Labor, rental of engine and overhead	<u>38.35</u>
<i>Total cost per acre</i>	\$42.39

Somewhat more than half of the expense was for manual labor.

In terms of current (mid-2014) dollars, multiply the above by the proportional change in the Engineering News Record Construction Cost Index, 202 in 1921 and 9845 today, making today's cost roughly \$2000/acre. Modern technology is more efficient, but at the same time, contemporary works incur costs not recognized in 1921, Such cost-indexing thus provides only a ball-park update.

The site was reinvestigated some 20 years later. From "Floating Mats on a Southeastern Coastal Plain Reservoir," Bulletin of the Torrey Botanical Club, September 1943, by Kenneth Hunt,

The Goose Creek Reservoir was formed in 1903 when the creek was dammed at a point 12 miles north of Charleston. This caused inundation of old sea-level rice fields which had reverted to brackish marsh. The reservoir is shaped like a question-mark, with a course 10 miles long

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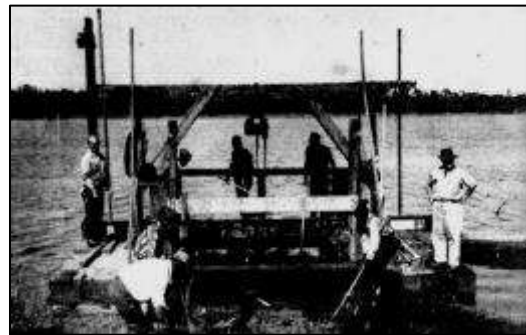
and a maximum width of five-eighths mile near the lower end. The area comprises 2150 acres, inundated to an average depth of 4 feet. The upper half of the reservoir is almost wholly covered with floating vegetation.

Much of the mat is composed of cattails, but over extensive areas shrubs and trees have become established. Occasionally during storms portions of the mats are torn loose, and islands with small trees upon them have been reported sailing down the middle or across to the opposite shore.

In the middle, a floating island mat on which are discernible the pioneer zone, the cat-tail zone (lighter strip) and the main body.



Raking has since been replaced by floating harvesters. Herbicide was applied when hydrilla infested 90 percent of the reservoir in the early 1990s.



"The Story of Kettle Moraine Lake's Floating Island," Sheboygan Press, Dec 5, 1956 (Chapter 77),

The story of Kettle Moraine Lake's floating island will be concluded within the next few days. Working with a huge crane and dragline bucket, workmen started hauling the "island" away Tuesday morning after building a gravel "driveway" out into the lake at Fahn's Resort, where the piece of land lodged last May after breaking off from the mainland across the lake.



The island, about an acre in size, has split up into two parts, each part lodged in a bay on the lake. The debris is being dumped a few hundred yards back in the hills surrounding the lake. Activity was halted for a time Tuesday when one of the pick-up trucks went through the ice. Men on the job include Harold Tomkins of Manitowoc, Milford Jung of Elkhart Lake, Harold Uhl of New Holstein, and Allen Ramel of Random Lake. The crew started a fire Tuesday afternoon in an attempt to burn the brush off the island, but the vegetation was too green to burn. Removal of the island is expected to take five or six days.

A floating island the size of two house lots with birch and alderwood bushes came to rest blocked the Tiden River in Sweden in 1993 and had to be towed to shore and destroyed by an excavator. Personnel used skis to walk on the marshy surface.

"Voyaging Isle Is No More," New York Times, September 26, 1951, Lake Minnetonka, Minnesota,
The voyage of Lake Minnetonka's block-long floating island ended ignominiously today. The Lake Minnetonka Dredging Company scooped the marshy island up with a large bucket device and dumped it on dry land. The fibrous bog, a block long and a half block wide, sailed around the lake earlier this month, damaging three docks and a rowboat before it was halted at one end of the lake.

"Floating Bogs Removed from Big Lake," Paynesville Press, August 21, 1996, Minnesota

With a thought to preserve their lake, members of the Big Lake Aquatic Association start the planning process in the spring to remove floating bogs. "We usually plan this project for every other year, but it all depends on how many bogs break loose each year," Dave Mutschelknaus, association president, said.

In 1993, about 200 dump truck loads of floating bogs were hauled to an area farm. There the bogs are allowed to dry out and they are then plowed under. Floating bogs are clumps of reeds which break loose from the lake shores during ice outs in the spring and high winds and wave action in the summer.

"Last year we hauled out 175 truckloads," Mutschelknaus said. "We had to wait for a rainfall as many of the bogs were stuck in shallow water and wouldn't budge." He explained once the bogs break loose from the lake edge, they float around wrecking spawning areas for fish, docks and boats.

Planning for the project starts in the spring as they need to cut through a lot of government red-tape before a bog can be removed from the lake.

Once a date is set, lake homeowners take the day as a vacation day from work to help. They roundup the bogs with their boats and push them to the public access on the south shore of the lake. "Last year we had 18 boats working together pushing a large bog across the lake," Mutschelknaus said. "It was quite a sight. It took us three days to remove all the floating bogs."

Removing the bogs from the lake is usually a two-day project. The night before the removal, the members of the aquatic association scout the lake, looking for loose bogs. They are then rounded up and pushed to the lake access by boat or pontoon. "Volunteers have to be careful with their boats as pushing bogs can put a boat's motor at risk with the low water in places," Mutschelknaus said.

The next morning, the bogs are pushed to the shore again, where a big backhoe is positioned to lift the bogs out of the lake, dump them onto dump trucks, and haul them away. This year, Gary Terres, St. Martin, removed the bogs from the lake. "We were lucky this year as the wind was in the right direction and helped push the bogs to the lake access," he added. At one count there were 10 boats pushing bogs this year. About 55 truckloads of bogs were hauled from the lake.

"Floating Islands," Big Island Pond Ponderables, Spring 2007, New Hampshire,

As a result of the high water and wind, an extremely large "swamp island" dislodged from the north end of the lake, and settled at the mouth of Dam Cove. It measured about 200 feet in diameter. It is BIP Corporation's policy not to remove such islands or fallen trees on behalf of residents; however, since this island posed a direct and immediate threat to the dam it could break up, be pushed by the wind and current into Dam Cove, and obstruct normal operation of the dam.

The NH Marine Patrol, Wetlands Board and Dam Bureau was notified of the situation. They could offer no help except to issue whatever permits we needed. Towing the "island" back to its original location was unlikely to succeed due to the distance and head wind. It is also inadvisable to move any of it into Dam Cove for the reasons stated above. Fortunately, after consultation with several BIP Area Directors and experts, it was decided that the only practical

way to remove the island was with power equipment from the shore. A large pit in the woods behind the affected houses was identified for disposal. Some equipment had to be rented and some was loaned by BIP residents.

The labor of several very dedicated machine operators, area directors, and residents (young and old) slowly chewed away at the island Saturday, April 21. By the time the sun set about 20% was moved. The next day a second excavator was rented. The operation moved into high gear with a truck of muck leaving every 5 to 10 minutes. By the time the sun set Sunday, the island was gone, and the pit was full of dark, black muck.



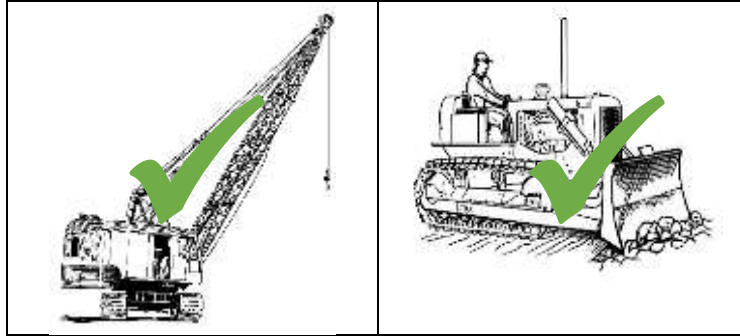
An engaging summary of "Crane, Bulldozers Tear Apart Roving Island in Bolton Lakes," [Bridgeport Telegram](#), February 28, 1955, in "Bolton's Mysterious Roving Islands," [Bolton Community News](#), June, 2004,

The action was taken under the supervision of the State [Massachusetts] Board of Fisheries and Game. The floating island measures 125 feet long, 75 feet wide and 7 feet thick. It had supported cedar trees (one eight yards tall that served as masts and sails to drive the island around Bolton Lake. It had become a favorite private spot for young Bolton boaters, explorers and lovers.

Bolton's roving islands were born when vegetation deposits created a layer of peat that had sufficient buoyancy to tear itself free from the bottom of the lake. Longtime lakeside resident Grant Davis noticed that they seemed to occur when the lake level changed. On occasion, he's witnessed the lake giving birth and has had to raise his sailboat's dagger keel in those areas where infant roving islands were not yet fully surfaced. In the last ten years, he has seen one island about seven acres across and a smaller one about a yard or more across.

In the rising evening mist, a roving island could be a haunting sight. They were primal forces, silently creeping about the lake, obeying only natural laws of wind and water currents. As the Bolton Lake population grew, one very large roving island seems to protest and sheared off more and more docks. Perhaps it had acquired some of the earth and spirit of the Native Americans interred beneath the lake. It would park itself wherever it pleased -- it was just too bad if it chose your sandy beach as its new resting spot!

Soon this mother of all roving islands seemed to be friendless. No one had anything good to say about the roving islands on February 28, 1955, when Bolton's largest recorded roving trembled its last time and was laid to rest.



1955

"Residents Want Solution for Weed Choked Lake," Journal Inquirer, August 15, 2011,

This is the second summer that the floating, hay-like plant has caused problems for boaters and swimmers on Bolton Lake.

Known as slender water nymph, the weed sprouts on the shallow sandy bottom then breaks off and floats to the surface where it chokes boat propellers, ensnares paddles and entangles swimmers.

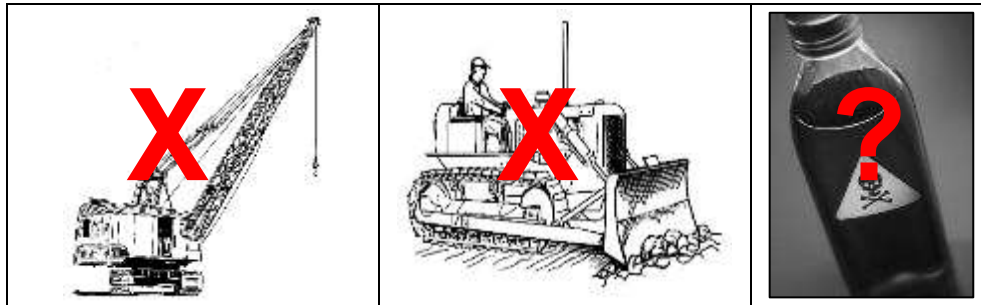
At this point the weeds are starting to sink and die off as they've gone through their life cycle.

Once they hit bottom, however, they'll seed and new sprouts should return in the spring experts say.

Officials are now testing the nutrient levels in the lake as they consider applying chemicals in some areas this fall or next spring.

"To do it now would only create more dead stuff floating up." Morris said. "And we don't want chemicals in there when people are swimming."

Costs for a harvester are in the \$200,000 range -- a hefty price tag for a small lake at a time when the state and towns are dealing with a budget crisis.



Today

Elevators

Elevators or conveyors have been used since the early 1900s to lift harvested vegetation onto barges, shorelines or awaiting dump trucks.



Sluicing

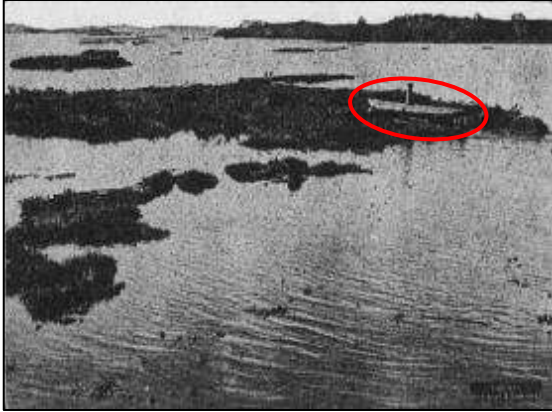
It's usually easier to pass along a problem than to solve it, and if passing the problem along tends to render a large problem into smaller ones, all the better. Sluicing a floating island through a dam's spillway resolves the problem for the dam, and the spillway turbulence tends to reduce the throughput to more manageable fragments. We'll note several examples of this management technique, the first meriting the most discussion because in the spectrum of waterworks, it's the biggest.

During the construction of the Panama Canal, loose agglomerations of semi-decayed jungle debris bound together by newer vegetable growth, were towed by steamer to the spillway of the Gatun Dam. Even those larger than the 45-foot gate passage were successfully sluiced under the gates without harm to the gate or roller train.

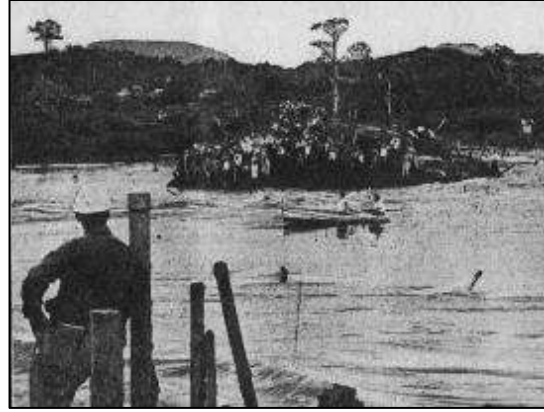
"Floating Islands in Canal," Washington Post, December 29, 1912,

"Floating islands" are the latest phenomena to appear as the Panama Canal nears completion. The term is used to describe masses of vegetation and earth loosened from the bottom of Gatun Lake by the rising water and blown about the surface by changing winds. These islands are virtually sections of the floor of the swamp that have been overrun by the water backed up in the Chagres valley by the Gatun Dam with the clay and leaves and sticks and other buoyant matter, the whole covered with luxuriant lush grass.

The islands are at times so thick that a launch cannot make its way through them, although they are not an obstacle or inconvenience to steamships. The launch Balboa is at present busy towing them to the spillway, where they float over the dam.



Steam launch pushing floating islands



Civilian and military spectators on a floating island

"The Panama Canal," National Geographic, February 1914, by William Sibert,

A large part of the bed of what is now Gatun Lake was formerly swamp land. In that swamp were logs on which grass and small trees had grown. When the lake rose, the entire bottom floated. The wind broke it into pieces, sometimes an acre or more in extent, and since that time these pieces have been floating aimlessly about the lake.

During the fall of 1912 the water was allowed to flow 6 or 7 feet deep over the uncompleted spillway, and a large number of these floating islands were passed over it. As soon as the lake reaches normal height and water can be spared, these floating islands will be towed systematically to the spillway and passed over and out to the Atlantic.

Panama and the Canal in Picture and Prose (1913) by Willis Abbot,

One vegetable phenomenon of the lake, now exceedingly common, will persist for some time after the ocean-going steamers begin to ply those waters, namely the floating islands. These range from a few feet to several acres in extent, and are formed by portions of the spongy bed of the lake being broken away by the action of the water, and carried off by the current, or the winds acting upon the aquatic plants on the surface. They gradually assume a size and consistency that will make them, if not combatted, a serious menace to navigation.

At present the sole method of dealing with them is to tow them down to the dam and send them over the spillway, but some more speedy and efficacious method is yet to be devised. However as the trees now standing fall and disintegrate, and the actual shores of the lake recede further from the canal the islands will become fewer, and the space in which they can gather without impediment to navigation greater.

"Floating Panama Islands," Southwest Contractor and Manufacturer, February 1, 1913,

The mass it at times so thick that a launch cannot make its way through it, although it would not prove any obstacle or inconvenience to a steamship, and would not be safe for a man to walk upon.

When the wind is blowing up the Chagres Valley, its common direction, the islands are driven against the trees that stand at the south side of the anchorage basin at Gatun, where they seem to be anchored. But now and then the wind dies down or changes direction, and the islands slip their moorings and drift out into the lake.

A noon when the men were leaving their work for luncheon, the lake was blue, and free from a speck of any kind, except as an occasional gust of wind tossed up a tiny white-cap here and there. An hour later when they were returning to work, the surface of the lake was dotted with small green islands. Such rapid shifting of the scene was due merely to a veer of the wind, for the islands are always ready to be caught up by wind or wave motion and floated into the lake.



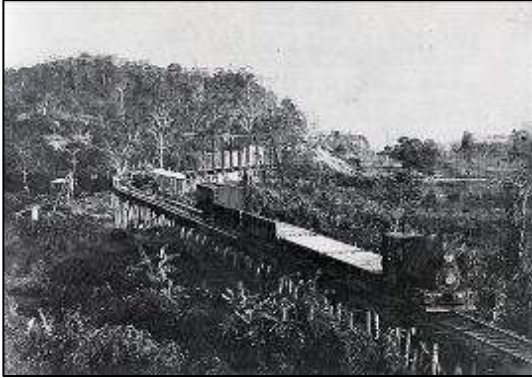
An island about three acres in area is the largest that has so far appeared in the basin at Gatun. The large masses break up easily into smaller ones. But up the valley of the Trinidad there are hundreds of acres afloat. The swamp floor seems to have arisen to the lake surface, and rises and falls in rhythm with its motion.

Rules and Regulations for the Operation and Navigation of the Panama Canal: Sailing Directions. General Information. August 15, 1919,

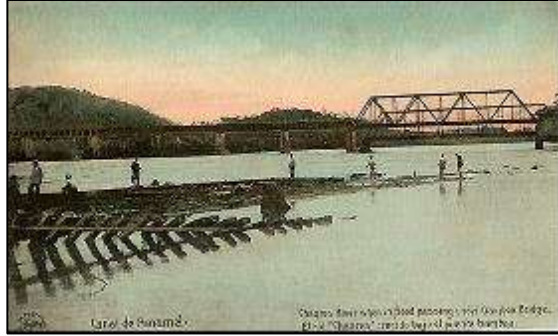
Floating islands have made their appearance, not only in the broader expanses of the lake, but have drifted or formed in some of the narrower reaches, and without local knowledge might be easily confused with the land. Particular attention must be paid to them when navigating the Canal after dark.



To keep the Obispo River out of the excavation, the French built a diversion channel and a railroad line to Gamboa, bridging the river in 1888 for this purpose, but not continuing beyond. As the bridge was in the path of the American canal and too low in elevation, it was replaced in 1908 by new bridge 10 feet above the water.



French bridge in 1907 flooding



"Chagres River when in flood passing under Gamboa Bridge," post-1908, apparently in the aftermath of a flood. The lower trestle built by the French. The higher is the American bridge.

In addition to the discrete, sometimes-towable, floating islands were the massive spreads of mosquito-breeding hyacinth.

Report of the Health Department of the Panama Canal (1915), Canal Zone Health Department,

Investigation of the so-called "floating islands" of Gatun Lake, Chagres River, and the Canal cut south of Gamboa, discloses extensive breeding of Anopheles albimanus and tarsimaculata that may yet prove to be a potential source of danger from malarial infection although at present no such result appears to have occurred.

The Anopheles larva; were found in great numbers among the leaves of these plants, where they are protected from wave action and young fish. The Dredging Division is attempting to destroy this vegetation by means of an arsenical preparation applied by a power spray mounted on a barge; while fairly successful, it is quite expensive, but is justified as a necessary measure in keeping the Canal free from these obstructions.

Annual Report of the Governor of the Panama Canal (1916), Canal Zone Governor,

The destruction of water hyacinths in the canal, Gatun Lake and its tributaries, was continued throughout the year. The outfit used and methods employed, were the same as in previous years, except that in the case of young plants it was found to be more effective to abandon spraying and pull the plants. Young plants are more or less scattered and the arsenic solution used is washed off by the waves and rains.

Two hundred and seventy-one thousand nine hundred and fifty square yards were killed by arsenic spraying and 478,200 young plants pulled up and deposited on shore... Valleys are so badly choked with drift and floating islands that a complete inspection was impossible.

Invasives weren't simply a problem of construction. In December 2010, massive treed floating islands entangled with Gamboa Bridge, causing a 17-hour closure of the canal.



To the right, floating vegetative masses of less consequence.

Pikes and Poles

"The Botany Class in Society," Scranton Republican, July 11, 1889 ;mentions the floating islands in Lake Henry, Pennsylvania;

The floating islands at Maplewood are on a strike, one of them has been chained fast in the middle of the lake, the others follow the wind when it bloweth where it listeth. Nobody wants an island up there. They won't take them as gifts and they say that when the alarm is sounded in the night, "The islands are coming" the cottagers stop not for pants and stay not for shoes but hasten to the shore armed with pike poles and boat hooks to shove the unwelcome guests away.

Hay Knife



"Floating Islands," Binghamton Press, July 24, 1940,

Floating Islands -- Wilton has one. Wilton which won notice because of its upside-down hill, now boasts of a three-acre island which floats about the surface of Wilson pond, and is causing much official concern in the fear it may develop into a navigational menace. The island once part of the mainland broke away from the upper end and has been moving about the pond.

"Famous 'Floating Island' Intrigued Residents," Lewiston Sun-Journal, September 2, 1993, by Ruth Adamo,

The town's famous "floating island" in Wilson Lake made headlines in newspapers as far south as Boston in the 1930s. An old yellowed copy of the Boston Post, dated Oct. 30, 1932, tells the story of this strange phenomenon.

According to the newspaper account, Wilton residents were amazed one day to see five acres of land sailing down from the head of the lake. The island, which attracted sightseers and reporters from many towns, had a small pond in the middle (a pond on an island in a lake. Go figure.)

According to the Post, the floating island had been "moored by roots and time" at the head of the lake for many years, possibly because of a recent big storm, the large piece of land suddenly broke away from the swampland up at the head of the lake.

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It was felt by those the paper called "the wiser ones" that if the wind blew the island down to the spillway at the foot of the lake, Wilson Stream would be plugged at its source, and the water would flood the town, the highways and the factories.

"The floating truant didn't keep them guessing long," according to the paper.

A strong crosswind sprang up and blew the island across the narrow part of the lake against the shore directly in front of Kineowatha Camp for Girls (now Kineowatha Park).

Ann and Elisabeth Bass, owners of the camp, decided to send for J. Howard Jellison, a construction engineer who had worked in Chicago, Boston and other cities.

But this was his first experience with runaway islands, according to the paper.

Interviewed by the Post reporter, Jellison said the island was about 1,000 feet long and of varying width, 300 feet at some points.

There were dozens of trees on it, some 12 feet high; water bushes, cranberry bushes and brush and grass. The thickness of the island itself graduated from three to seven feet.

So Jellison decided to tow the island back to its original site. The equipment he needed for this monumental task included a large motorboat from Rangeley Lakes, smaller boats and a barge.

The Post reporter, Joseph D. Harrington, asked if he was able to tow it. and he answered, "Sure, after we cut it up into about 20 pieces."

For this Jellison used a three-foot-long hay knife with a handle. He ordered special hooks made for him by the blacksmith at the Wilton Woolen Company, Joe Holland. These hooks were made of inch-and-a-quarter wrought iron, about six feet long, with the end bent around to a radius, and a hook at one end.

"When we hooked onto that stuff with the hooks. It held like leather. Never saw such stuff," he said.

One of the 20 pieces into which the island was cut was about an acre, others were smaller. Eight men worked with Jellison.

They put flashboards up at the dam at the foot of the lake to keep the water level up, and worked the first five days and nights straight through, because the wind was down. In all, the job took two weeks and two days.

The pieces of island were towed up to the shallow water at the head of the lake, and 700 stakes (half of them were willow) were used to pin the island down to the bottom of the lake. Jellison said the stakes were really piles 12 to 14 feet long and six or seven inches in diameter, and were driven down with a maul. He expected that they would "sprout down there and hold her tight."

The ambitious and ingenious project worked for about three years. But according to memories of some local residents, part of the pieces of island began to break away at that time and showed signs of again drifting down the lake.

According to some, the pieces of island were loaded onto trucks and hauled away to an unknown destination.

Another version of the end of the story is that the island fragments were blown up, and then disposed of.

Fire

Burning peat swamps
in Kalimantan, Borneo



The peat stratum off the Okefenokee is up to 20 feet thick and undergirded by impermeable clay. Hollows within the peat collect rainwater to form small lakes called prairies. Methane and hydrogen sulfide from decomposing vegetation periodically cause the swamp's bottom to rupture, sending large chunks of peat to the prairie surface, where, supported by gases trapped beneath it, it dries and becomes a floating island.

Invading plants begin with macrophytes. Then come sedges and grasses, followed by such shrubs as cyrilla, pepperbush, hurraybush, buckwheat, poison ivy and poison sumac. If the surface is dry enough, cypress, magnolia, black gum, red gum, red maple and willows will take hold. By the time the trees are a few years old, the island is called a "tree house," its roots blending the island with the swamp floor. A lightning strike can easily burn acres of trees and bush. Where the peat burns, a new hollow is created and the stage is set for creation of a new prairie.

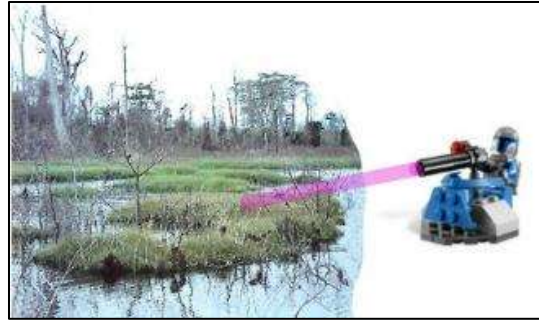
"The Floating Islands or Florida," Red Cloud Chief, March 19, 1874, about Lake Poinsett,

We passed several floating islands. They are formed by the dead roots of the smart weed and other swampy vegetation torn up by the wind and hurled upon the shore. A soil is formed, birds drop acorns upon the mass, and little trees make their appearance. A second wind sends the whole thing out on the lake, where it floats subject to every breeze. One of these islands was sunk in the channel between Lakes Poinsett and Winder, in the memorable gale of August, 1871. The Captain asserted that he had cut many a bay tree over a foot thick from the sunken island. Its dead trees still appear above the water at the month of the river. Sometimes Indians and white hunters set these islands on fire. The blaze generates a gale, and the burning islands are driven across the lake. Some of the islands are over a half mile in circumference.

Laser

From "Aquatic Control Program," National Meeting of the Weed Control Society (1970) by E.O. Gangstad, a "promising new method" for which we've taken the liberty to illustrate.

One of the promising new methods for control of obnoxious aquatic plants such as the water hyacinth, water milfoil, elodea, and alligator weed is a powerful laser beam to bombard the plant. This beam, projected by equipment mounted on a boat or helicopter, may be capable of destroying not only floating plants but also those which are submerged or rooted in the bottom.



Consolidation

The Boathouse on Lauderdale Lake, Wisconsin, is, in fact, a once-lavish mansion of the Prairie School style with gangster-era and Ziegfeld Follies history. Below are two century-old photos of roughly the same lakeshore, one revealing the profusion of aquatic vegetation, the other, "Floating Island," an effort to corral the cover.



Goats

Originally, water flowed from Madison Wisconsin's Lake Mendota to Lake Monona, via broad sheet flow through the isthmus wetlands and percolated through the underlying glacial till. When Tenny Port lock and dam was constructed at the end of the 19th century, water levels rose 5 feet in Lake Mendota, requiring thousands of glacial erratics to riprap rampant erosion and causing sedge meadows to float up by the acre during flood events. More than 640 acres of Mendota wetlands have been since lost.

Island flotation continues. "Bog Down," Capital Times, August 18, 1993, reports a 1.5-acre floating island removed from Lake Mendota and used for compost. "Riding Herd on Lake Bogs: Don't Try to Understand 'Em, Just Rope, Tie and Disband 'Em," Wisconsin State Journal, June 18, 2004, reports floating islands washed into Lake Mendota being pushed to shore and staked in place.

Disappointed with the results and unwilling to resort to chemical treatment, residents turned to goats to graze the non-native honeysuckle and buckthorn of a 100 by 500-foot island floating just offshore.



Nutria

Rodent attack wouldn't be an engineered destruction of a floating island, but as it is somewhat mechanical, we'll include a story from Lake Hatch, Louisiana, "The Nutria's Insatiable Vegetarian Appetite Puts Louisiana's Floating Islands of Vegetation in Peril," Los Angeles Times, April 10, 1994.

There are floating islands in Louisiana--islands where herons nest in the branches of myrtle trees, alligators cruise beneath the roots and slow ripples spread out with every step you take. The mat of leaves, stems, and roots sinks beneath your feet and rises again behind you.

But now these floating masses of vegetation are in danger, all because of the insatiable appetite of a strange critter called variously the rat beaver, the coypu or the nutria.



It is a snub-nosed, slow-moving beast with webbed feet, scraggly fur, a naked, rat-like tail, and inch-long, orange buckteeth. Unlike rats, nutria average 15 pounds, have plush, velvety pelts beneath their scraggly guard hairs, and are vegetarian.

But their diet is a danger to the marsh.

They have gnawed some areas down to circles of mud hundreds of acres across, said Greg Linscombe, a biologist with the state Department of Wildlife and Fisheries. They stymied a study to see if cypress plantings could reduce marsh erosion by gobbling all 100 seedlings within a few days.

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"There are some areas where you can go out and see literally hundreds of animals," Linscombe said. "It looks like a big pasture, except the whole thing is floating. And as far as you can see on the horizon, you see nutria."

But, he said, it is almost impossible to measure overall nutria damage in the masses of vegetation known as "flotants" in French or, in English, "floats."

"These floats are moving around. You almost have to do aerial photographs and measure land-water ratios over time to see if there is more water and less land."

Nutria exclosures, Terrebonne Parish, Louisiana



Beaver

Floating Island Lake in Yellowstone National Park received its name from mats of grass and reed that separate from the bank and float onto the lake. As described in "Floating Island in Yellowstone Park Causing Wonderment," Helena Daily Independent, August 7, 1932,

A floating island recently discovered in Yellowstone National Park is causing considerable wonderment and conjecture among visitors. The island is about 20 feet long and about half that wide, is located in Beaver Lake near the Tower Falls area. Its position changes almost daily, one day finding it at one end of the lake and the next at the opposite extreme.

First discovered by truck drivers who passed the lake daily and noted its varying positions, the unique island was later checked by Frank Mattson, junior landscape architect with the National Park Service, and found the island to be an actual floating island.

Various theories have been put forth as to the structure of the island, but the most probably one seems to be that it is the remnant of a huge beaver house which has broken loose from its moorings.



"Heavy Rains Launch Floating Island in Hawk Lake," Minden Times, August 5, 2005, mentions that cottagers on Big Brother Lake, Ontario watched a 35 by 20-meter section for forest float by.

It is home to two beaver lodges and several dozen trees.

The island was subsequently tethered to the shore.

"Lake in Yellowstone Has Floating Island," Science News Letter, October 14, 1933, notes that beavers were trying to establish a hut on the island, which consisted mostly of rushes and beaver cuttings.

Crescent Lake, in Yellowstone National Park, has a mysterious island that for long has been observed to change its position constantly. Recently park rangers believe they have solved the mystery. After examining the island closely, they have come to the conclusion that it is made up solidly of rushes and beaver cuttings which have become bound together over many years by plant growth. At the present time beaver are piling the island surface with new cuttings and the rangers believe eventually a new gigantic beaver hut will be erected on the floating island. Indications are that the beaver are attempting to anchor the island solidly to the floor of the lake, but so far it remains unmoored. Eleven adult beaver inhabited the lake during the past summer.

That island no longer exists in its former dimensions, but according to Susan Butler, in Scenic Driving Yellowstone and Grand Teton National Parks (2006), there are still remainders.

Floating Island Lake, to the right at about 15 miles, has an island of floating vegetable matter—moss, bacteria, other plant life, and debris. When I passed, not one, but two floating islands were working their way across the pond; sometimes there are none.

Photographic evidence.

The beavers, as well, we fear, are gone.



Fire

Traveler and hunter, Charles Naus began work in 1933 as an advisor to the Colonial Development Fund of the Bechuanaland Protectorate, what's now Botswana. Naus' first inspiration was that rivers might be cleared of obstructive vegetation by fire. Dams would stop the flow and allow the channels to dry out.

The first dam built was on the middle channel of the Borokha River, 1050 feet long, 24 feet wide and 14 feet high. When the dam was nearly finished Naus was impressed by the current sweeping through gap remaining to be closed and formed a curious theory that dams with gaps in them somehow increased, not diminished, the total flow. Against the advice of the Government Engineer, he was allowed to proceed with another half dozen "dams" with gaps.



Oxen pulling car across river,

just upstream of the dam site.


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Needless to say, the riverbeds didn't desiccate and the fire method was never carried out.

Conclusion

There are many ways to attack a floating island.

Herbicides	
Dynamite	
Artillery	
Hand Sawing	
Mechanical Sawing	
Shredding	
Crushing	
Harvesting	vs.
Track Hoes and Draglines	
Derricks and Grapplers	
Elevators	
Sluicing	
Lasers	
Nutria	



There are fewer ways to destroy one.

CHAPTER 83

DIE



The game ChaosStorm

A grim chapter, this one, so we'll keep it brief, but the fact is this: one can die upon a floating island, and/or one can end up on a floating island after one has already expired.

We note the risk in swimming under a floating island in Chapter 67, and the floating islands of Chapter 47 carry with them the possibility of combat fatality. Had the Chapter 57 come to be, we most certainly would have had crash landings on floating airfields. Sailors are shipwrecked on the icebergs of Chapter 60 and the jaguars of Chapter 42 can consume visitors. Floating islands can indeed be fatal.

In this chapter, we'll round out our morbid review.

In peat bogs in which water does not circulate, pH tends to be less than 5 and the anaerobic condition slows biodegradation. Preserved human cadavers -- especially the skin -- a thousand or more years old have been exhumed from such environments. Because floating peat tends to continuously slough its lower strata, however, an Iron Age corpse isn't likely to persist in a buoyant bio-casket. It's more likely to be exhumed from a bog gone dry.

In artificial caskets, on the other hand, we find corpses that have sailed. While a floating box doesn't merit floating island status, we can't refrain from including a few such accounts, beginning with a May 16, 1751 report in the London Evening Post.

We have an account from Hamburg that on the 16th April last, about six leagues off the North Foreland [near Kent, England], Captain Wyrck Pietersen, commander of the ship called the Johannes, took up a coffin made in the English manner, and with the following inscription upon a silver plate, "Mr. Francis Humphrey Merrydith, died 25 March 1751, aged 51," which coffin the said captain carried to Hamburg, and then opened it, in which was enclosed a leaden one, and the body of an elderly man embalmed and dressed in fine linen. This is the corpse that was buried in the Goodwin Sands a few weeks ago, according to the Will of the deceased.

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Of similar nature, one that didn't get to salt water. An August, 1902 downpour flooded Spring Garden Brook in Madison, New Jersey, washing 59 graves out of Hillside Cemetery

To the horror of the neighbors, bodies were found along the course of the brook the next morning.



On a more upbeat note, "The Corps that Saved 3 Men from Drowning!" November 12, 1912, on how a floating coffin can save lives.

The steamer "Mayflower" sank in Lake Kamanisgeg, Ontario, drowning 9 persons, including its owner and its captain, but 3 passengers survived by lashing their hands together across the top of a coffin in which a body was being transported for burial.



The most-persistent floating-coffin tale concerns Canadian actor Charles Coghlan, who, while on a U.S. tour in 1899, became ill with acute gastritis and died in Galveston. The actor's lead-lined **coffin** was placed in a granite vault in a local cemetery, from where in the following year, the Great Hurricane, supposedly swept it out to sea. For the rest of the story, we've again the authority of Ripley.

"Charles Coghlan Comes Home!" Believe It or Not!, September 15, 1927, reprinted in Ripley's first book, 1929.

He died in 1899 and was buried in Galveston, when the Great Flood came and his coffin was washed out to sea and the Gulf Stream carried him around Florida and up the coast to Prince Edward Island -- 2000 miles distant -- where he lived.



Believe It or Not? The evidence -- and indeed this story has been well pursued by journalists -- says "not."

"Coffins and Buried Remains Set Adrift by Hurricanes Create a Grisly Puzzle," New York Times, October 25, 2005,

Hurricane Katrina upended vaults in Merrick Cemetery in St. Bernard Parish, just east of New Orleans.

The living were not the only ones uprooted by Hurricanes Katrina and Rita. The force of the storms literally raised the dead from their resting places in peaceful parish cemeteries, sending nearly a thousand coffins and vaults floating across the Gulf Coast and creating a macabre puzzle for Louisiana coroners and morticians. Storm surges as high as 20 feet transformed two-ton concrete vaults, tombs and coffins into virtual ships that traveled for miles across parish lines, landing in front yards, fields and swamps. One barnacle-encrusted vault found underwater in a marsh is thought to have been a victim of Hurricane Audrey in 1957.

More up to date, we show the wrath of Hurricane Ike, Orange, Texas, 2008.



And then we have tales of volcanic aftermath. More than a year after the eruption of Krakatoa (Chapter 30), pumice washed ashore 8200 kilometers at Durban, South Africa, and sailors continued to report the sea-borne novelty for yet another year. A letter in the London Times, December 12, 1883, from a crewman who passed southwestward through the Straits of Sunda not long after the eruption,

For two days after passing Anjer we passed through masses of dead bodies, hundreds and hundreds striking the ship on both sides-groups of 50 to 100 all packed together, most of them naked. We passed a great deal of wreckage, but of course we cannot tell if any vessels were lost. We also passed bedding chests and a number of white bodies, all dressed like sailors, with sheath knives on them. For ten days, we went through fields of pumice stone.

"The Java Earthquakes," The Sailors' Magazine Seamen's Friend, February 1884, by Capt. J.W. Baker,

But the most remarkable and fearful thing of all was the sea of corpses. For nearly three days we came across body after body of persons who had lost their lives in the earthquake. One man alone was said to have counted sixty bodies in plain sight, and how many more there must have been throughout the Straits you can tell as well as I. Thousands must have perished. It was a sight never to be forgotten.

A handwritten letter from Miss Allen, headmistress of a mission school in Zanzibar, in the archives of the Royal Society,

About the third week in July 1884, the boys from the Mission schools were much amused by finding on the beach stones which would float, evidently pumice-stone. The lady who was with them and who afterwards told Miss Allen of this fact, also noticed that there were a quantity of human skulls and bones "all along the beach at high water-mark"; these were quite clean and had no flesh remaining on them, and were found at intervals of a few yards, two or three lying close together.

While the undertaking role, so to speak, of pumice rafts is not explicitly asserted, the bodies (or parts thereof) were transported substantially further and with less decomposition than what would have occurred had they been submerged in the open ocean.

"Floating Islands," Honolulu Republican, September 5, 1901, is a bit macabre.

In March, 1855, within one day's sail of Point de Galle. Ceylon, the British steamship Ashton happened upon an apparently artificially constructed island, consisting of bamboo canes of all sorts and conditions. Reclining peacefully among the involved mass of material was the dead body of a man and close beside his solitary corpse were two books. The reading matter was secured by the adventitious aid of a boot-hook, and proved to be in Hindustani characters, utterly beyond the literary acquirements of any of the toilers of the deep sea to decipher. Shortly afterward the inquisitive sailor who succeeded in fishing the books from off the surface of the floating island structure developed strong symptoms of cholera, so they were thrown overboard without delay

Russia has its coffin-island stories. The floating islands of Lake Plavucheye, north of St. Petersburg, for example, are said to have been formed from caskets thrown into the water.

Vladimir, 200 kilometers east of Moscow, was a medieval capital of Russia. From Jeremiah Curtin's The Mongols in Russia (1908)

Near Vladimir is a dark, swampy lake. In that weird lake is a spot which the people call "Floating Island." On that island are seen dark patches, which move hither and thither when the wind blows. Every anniversary of Andrei Bogolyubof's murder, noises like groans are said to come forth from the depths of that lake, now known as "Foul Water" into this foul water the basket containing Andrei's false princess was thrown, and into it were hurled also the murderers' bodies.

Let's not leave out the fictional side -- the confessed fiction, that is. "The White Horse," Saturday Evening Post, June 20, 1925, by Frederick Anderson, takes place at a reservoir in which vegetation grows from roots lifted from the original forest floor. The plot involves fishing through holes cut in a floating island and the discovery of a corpse on the underside.

It was a floating marsh of flags and moss and sheep kill and alders and cranberries, with here and there a dead spar. The roots were matted like felt, the whole as buoyant as a straw mattress. Bullheads in countless numbers lurked in the black depths beneath. Years ago when the reservoir was built the rising waters between the hills had lifted this great section of the spongy forest floor, fully an acre in extent, and it continued to float en masse. Years had added fiber to it, until now it formed a floating island that drifted this way and that with every changing wind. There was nothing mysterious about fishing with a hatchet.

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The four men seated themselves comfortably on their soap boxes in a family circle, and baited and smoked and yanked and fought mosquitoes. Occasionally an astonished bullhead would find itself jerked up through a hole and admonished to be good, with a sharp rap on the snout from a knife haft.

"We're moving!" cried Jute, looking at the shore.

A World War II Japanese psychological warfare leaflet depicting President Roosevelt pushing a soldier toward a grave marked "The Unknown" on a floating island. Japanese bombers fly overhead.

Framed

*You did not want to fight
You did not want to leave your
sweetheart
Your mother and your kids --
You did not ever think it would be
necessary
For you to dig your own grave --
He did it all for you!*



And to the future!

A stone columbarium lining the upper deck of the proposed Hong Kong Floating Eternity could hold up to 370,000 funereal urns.



Floating columbarium, Hong Kong

"River Styx Inspires Western Design's Dorset Burial Chapel," [Building Design](#), November 12, 2010, the Woodland Burial Chapel

Conceived as a floating island, the non-denominational chapel is surrounded by a moat -- in reference to the River Styx -- which widens to become a reflecting pool at the southern end of the site. Inspired by the form of ancient burial mounds common to the area, the complex nestles within a curving landscaped berm, giving the impression that the sunken spaces have been carved from the landscape.



Enough of floating funerary.

CHAPTER 84

EAT IT

Sarah Rossiter's short story "Floating island," Prairie Schooner 68.3 (1994), begins with the apparition of an island floating on the horizon.

Leona Peterson stands on the dock, holding a Snickers bar she just bought. She's never seen this much water before. The wind blows fresh and blue waves dance and nothing seems to be standing still, not the water or sky or the small rocky islands. From a distance the islands look like they're floating. On each island there's a house Lake Huron, she thinks, Ontario, hoping names might pin things down but sunlight glitters, sharp as glass, and all that dazzle makes her dizzy. Where she lives the land lies flat except when wind moves through the wheat, a restful motion, not like this. Waves smack the dock. The gray boards shiver.

The story draws closer and closer to home and ends in the kitchen.

"There," says Leona. She picks up a spoon. "This was Alwood's favorite dessert, and I bet you don't know what it's called." Justin blinks. Leona smiles.

"Floating island, how about that, but it should be islands actually. See, there's Burnt Island, and Sutters that we see from here, the one that has the lighthouse on it, looks just like the tower you built, and there's the mainland on this side, and here's our island, Little Egg. See, I even made the cove, and all this blue, well, that's the lake."

His lips twitch. He takes the spoon. She sits back, watching, as he eats, first the islands one by one and after that he eats the lake. He sucks the custard through his teeth until the boat is all that's left. Tenderly he lifts it up, a small white feather light as loam, and slipping it into his mouth, he licks the spoon until it's clean.

Julia Child's Floating Island



For creme anglaise: 6 large egg yolks 2/3 cup sugar 1 1/2 cups very hot milk Pinch of salt 1 tsp. pure vanilla extract 3 Tbsp. unsalted butter (optional) 2 Tbsp. rum or another liqueur (optional)	For meringue: 1 Tbsp. softened butter 1/4 cup sifted confectioners' sugar 1 2/3 cups egg whites (about 12) 1 1/2 cups granulated sugar 1/2 tsp. cream of tartar large pinch salt	For caramel sauce: 1 cup granulated sugar 1/3 cup water 2-3 Tbsp. heavy cream 1 Tbsp. butter
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For creme anglaise:

Preliminaries. Whisk the egg yolks in a 2-quart saucepan, adding the sugar by fairly rapid spoonfuls. If it goes in all at once, the yolks can turn grainy.

Continue beating 2 to 3 minutes, until the mixture is pale yellow and thick. By dribbles, stir in the hot milk--stirring, not beating, because you do not want the sauce to foam.

Heating the sauce. Set the saucepan over moderately low heat, stirring rather slowly with the wooden spoon, and reaching all over the bottom and sides of the pan. The sauce should gradually come near--but not to--the simmer. You must be careful not to overheat it and scramble the yolks, but you must have the courage to heat it enough so that it thickens. Indications that it is almost ready are that surface bubbles begin to subside, and almost at once you may see a whiff of steam rising. Watch out at this point, you are almost there!

When is it done? The sauce is done when it coats the wooden spoon with a light creamy layer thick enough to hold when you draw your finger across it, as shown.

Finishing. Beat in the vanilla, and the optional butter and rum. Serve warm, tepid, or cold.

Ahead of time note: The sauce may be refrigerated in a covered container for several days.

For meringue:

Preliminaries. Butter a straight-sided 4-quart baking dish 3" deep and dust the inside with confectioners' sugar, knocking out the excess. Preheat the oven to 250 degrees F.

Beating the egg whites. Start beating the egg whites at moderate speed until the foam throughout, beat in the salt and cream of tartar, then gradually increase the speed to fast until soft peaks are formed.

Beating in the sugar. Beat in the sugar by big spoonfuls and continue until stiff shining peaks are formed. Beat in the vanilla, and turn the meringue into the prepared baking dish.

Baking. Bake for 35-40 minutes at 250 degrees F. Set in the lower middle of the oven and bake until the meringue has risen 3 to 4 inches.

When is it done? A skewer or straw plunged through it comes out clean.

Cooling. Set the casserole on a rack. The meringue will sink down to about its original height as it cools.

Ahead of time note: covered airtight, it will keep several days in the refrigerator or several weeks in the freezer.

For caramel sauce:

Preliminaries to boiling. Blend the sugar and water in the saucepan and bring to the simmer

For serving:

Fresh berries, optional.

A Less Appetizing Entree

From "The Convict System in Siberia," Harper's, August, 1898,

For twenty minutes we dived and dug in the floating island of grease with our forks, but never found the steak. We concluded it was best to say nothing and quietly returned to our stalls.

Kitchen as History

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"Floating island" was a well-known English pudding dish in the 18th century, made by creating an "island" out of layers of light cake or bread, jam and jelly (i.e. Jello) and surrounding it with a "sea" of cream which might have been whipped with lemon juice, sherry and sugar, or thin custard. It was traditional to decorate the culinary delight to look like a real island, with sprigs of greenery for trees, cream for snow mountains, etc.

The French "Ile Flottante," a molded meringue "island" in a custard sea, ousted the native floating island from the British culinary repertoire in the 19th century, though all the components of the British floating island survive to this day in the classic trifle.

A New and Easy Method of Cookery (1755), Elizabeth Cleland

To make a floating island, take a pound of currant jelly, and the whites of four eggs. Put them in a large bowl, and whisk it till it is as thick that you may drop it with a spoon into any shape you please. You must keep whisking all one way. It takes a long time to whisk it and it must be whisked from the bottom of the bowl. Then drop it by spoonfuls on an ashet, and raise it up as high as you can. Put under it two gills of cream, a spoonful of rose-water, and a little sugar: You may make it of roasted apples the same way, but they must be cold, and mash them with the back of a spoon. You may put a yellow cream under it, but don't make it too stiff.

The Art of Cookery, Made Plain and Easy (1760) Hannah Glasse,

The floating island, a pretty dish for the middle of the table and a second course, or for supper.

Benjamin Franklin, Autobiography of Benjamin Franklin (1868), a letter written to his wife after a visit to Twyford in 1771,

I spent three weeks in Hampshire at my friend the Bishop of St. Asaph's, The Bishop's lady knows what children and grandchildren I have, and their ages, so, when I was to come away on Monday, the 12th, in the morning, she insisted on me staying that one day longer, that we might together keep my grandchild's birthday. At dinner, among other nice things, we had a floating island, which they always particularly have on the birthdays of any of their own six children, who were all but one at table.

"A Rainy Day with Uncle Remus," Scribner's, July 1881, by Joel Chandler Harris, illustrates the stereotypical American past,

Suddenly Uncle Remus paused over one of the dishes, and exclaimed:

"Gracious en de goodness! W'at kinder doin's is dis Miss Sally done gone en sont us?"

That, said the little boy, after making an investigation, is what mamma calls a floating island."

"Well, den," Uncle Remus remarked, in a relieved tone, "dat's diffunt. I wuz mos' fear'd it 'uz some er dat ar sillerbug, w'ich a whole jugful ain't ska'cely nuff fer ter make you seem like you dremp 'bout smellin' dram. Ef I'm gwineter be fed on foam," continued the old man, by way of explaining his position on the subject of syllabub, "let it be foam, en ef I'm gwineter git dram, lemme git in reach un it w'ile she got some strenk lef'. Dat's me up and down. W'en it come ter yo' floatin ilun, des gimme a hunk er ginger-cake en a mug er 'simmon- beer, and dey wont fine no nigger w'ats got no slicker feelins dan I is."

A press-agent release, "The Kind She Wanted," Los Angeles Herald, April 25, 1897,

Howard Paul is responsible for this anecdote of Lillian Russell. The fair vocalist was lunching at a restaurant and ordered "floating island," a popular entremet. In due course of time it arrived and on its snowy surface three little red ants were having a cheap picnic and wriggling about in ecstatic contortions on the banquet they were enjoying. "Walter," said Miss Russell. "I asked you for an island, but I expressed no desire to have it inhabited. Take it away and bring me a dessert island."

Chapter 84 -- Eat It

"Floating Island," Saturday Evening Post, June 26, 1920, by Nina Putnam,

I wish at this moment that I were a manufacturer of Easter, Christmas and birthday cards so that I might have the right medium through which to visualize for you a properly made floating island. Its beauty has angels, lilies and Christmas snow beat a mile. Think, oh think, with your palate if possible, dear reader, think upon the custard, rich and smooth, egg-golden, vanilla-flavored, which once glowed through the depths of the pressed glass dessert bowl! Think likewise upon the islands themselves which floated upon this succulent sea -- those firm yet foamy islets with their crimson cases of currant jelly lying like a ruby in the heart of each.

"The Difference," The Bemidji Daily Pioneer, January 13, 1920

"Why not combine the suggestions for dessert?"

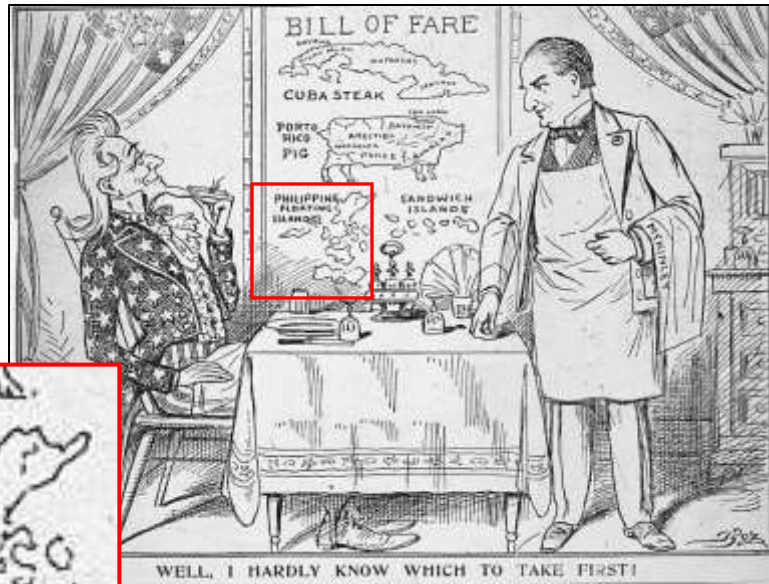
"How so?"

"Put on the table a cottage pudding on a floating island."



The menu of politics.

Cartoon showing President William McKinley as a waiter taking orders from Uncle Sam who is choosing what to eat. On the bill of fare: Cuba Steak, Porto Rico Pig, the Sandwich islands, and for dessert, Philippine Floating Islands, reflecting the expansionist designs of the United States.



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For those on the run,



And for those with problems more severe, A Primer of Psychology and Mental Disease (1906), by Bell Burr, notes the desert's value for treating "Insanity: Acute Alcoholic Delirium."

The calm manner and assuring tone of voice may be of great service in suggesting to the patient the unreality of morbid impressions, but much conversation on any subject is to be deprecated. In diet, malted milk, digestible cocoa, coffee, egg-nog without liquor, blanc-mange, floating island, beef peptonoids, soups, and broths may be used.

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