1. Ophiura medium encrusted from a new specimen p. 397 & A.

C. B. See Notes for Catalogue.

Action to be made forthwith.

Also subscribers must pay to W. Lock.
question to be considere in the place fr 476

Neuropho's nenn be op nee na cent at mel fr 382.
Geological Survey of Illinois.

Part II.

Palaontology of Illinois

Section II.

Report on the fossil plants of Illinois

By Leo Lesquereux.

1870.

pl. 7. - XXXI.
Megalopsism, Wallis.

...the middle, or from the base somewhat higher to the tabule, in a less oblique divergence and bearing as a point toward the blades at first running out a lateral and of divergence from the broad medulla then passing to the blades, the distance of the blade is a way, when the medulla, in common tuly paper, when the surface, is marked as somewhat pointed by sylase and being the medulla about a right angle. It may be that if I represented a whole sheet in the process of development in perhaps a different period, or the vein of the lower blade, is not observed and contumacious, or in fig. 2, but here, to a border of the rachis marked the parallel line and not by medulla. This difference also between these rachis and medulla of these two seeds seem, too great for supporting their identical. I propose therefore to name the 1. Megalopsism, wallisii. 2. M. dutchwellii. The revolute is the same as both varieties somewhat different, the revolute in 2 being more distant and another. Fig. 3 may be named M. candidum or something like one of the species of Dactyliospermum show the revolute somewhat distinct and in my figure ... compound the fragment of Megalopsism which show... and here the doubled and signed by dactyliospermum. The margin of the blade is 5 4 times the length of their width. This can be seen in fig. 1. and I have a sketch from northwell which represents fragment of leaflet 11 1/2 centimeters and therefore the length should have measured about 70 centimeters. The medullae is 6 millimeters broad, the vein very distinct, and of course more clearly than in my figure at least 10 says northwell. The character of revolute is however the same. The revolute as in fig. 1, this leaf very distinct, arising at the broad, three-five millimeters, in 16 to 17, for 8.5 millimeters; of space, generally forming on one of these a simple at the top and parting one of the middle rachis above, namely from the middle at an angle varying from 65 to 65. Themselves being more elevated, the surface of the blade, and nearly horizontal or right angle to the rachis is their declining base, and joining the revolute by abruptly carrying down ward and reaching it in an angle of about 30°. The borders of leaflet in Smith 311 fig. 1.
Calamite, approximately as on p. 331 (1). Another specimen of Loc. 374.
Greatly inflated and bent. Not the articulation without inflation, very short
and irregular, as on p. 377, from 6 to 10 mill. broad, the bulbs faced ten times of hand,
by far and irregular.
FOSSIL PLANTS.

INTRODUCTORY REMARKS.

The generic classification of the species of fossil plants, enumerated and described in this paper, is the same as that in the second volume of this Report. Perhaps it would have been advisable to modify, by subdivision, a number of our genera, especially for some species of ferns, of which we have recently obtained fruiting specimens, which seem to indicate a relation to peculiar species of the present time. But as this Report is a mere continuation of the first, a change of classification would have rendered it more obscure to the student, and would have required a long discussion on the value of some of these new genera, without any advantage to science. For the fructifications of the fossil ferns are scarcely, if ever seen, except obscurely, through the substance of the leaflets under which they are attached, and even when the position of the sori or groups of fructifications relatively to the veins and veinlets, or to the borders of the leaflets can be ascertained, their true form, and especially the mode of attachment and of dehiscence of their indusium cannot be recognized. The natural affinity of these fruiting fossil fragments is, therefore, always more or less uncertain, and a mere change of name, without sufficient authority, tends to obscure, rather than to enlighten the classification. I have, therefore, merely appended some remarks to all the species, which, by their known organized parts, may differ in some way from the characters of the genera to which they are united. I have also, in this paper, omitted to repeat descriptions of genera and of species already given in the second volume of the Report, but have added to the names such remarks as have been suggested by the discovery of more complete specimens. In botanical palaeontology, we have to deal merely with fragments, and none of these separate fragments are sufficient, in themselves, to indicate the general character of the whole plant to which they belong. The discovery of each part of a fossil plant adds, therefore, to our acquaintance with a species, and the record and description of any of the separ-
ate members, are often of more value to botanical science, than the description of so-called new species, established on some remains of a peculiar form, and of unknown relation.

The number and diversity of the plants published in this volume, tend to indicate the richness of the fossil flora of our Coal Measures, and at the same time, show an increasing activity in research.

The publication of the fossil flora of the second volume of the Geological Survey of Illinois, has excited a remarkable interest for botanical palaeontology. Not only private gentlemen have given their time to the collection of specimens, but local societies have been formed for encouraging research, and founding cabinets of fossil plants. We can therefore hope soon to see our fossil flora in America as thoroughly studied and as well known as that of Europe, where this field of science has been ardently worked for more than a century.

Among those to whom the survey is especially indebted for the communication of valuable material used in the preparation of this Report, thanks are due to Mr. Jos. Even, of Morris, who, after the loss of his valuable cabinet by fire, has begun again his researches with renewed zeal and great success; and to Mr. S. S. Strong, of the same place, who has most liberally presented the State Cabinet and myself with a large number of specimens of rare and new species. Messrs. M. Prendel and John Collins, also of Morris; Mr. M. S. Hall, formerly of Wilmington, and Mr. Thos. Tijou, of Duquoin, have also furnished valuable contributions to this Report. As, moreover, the assistants of the State Geological Survey were instructed by the State Geologist carefully to look for and preserve specimens in their explorations, and as the Director of the Survey and myself worked hard in collecting specimens as often as opportunity permitted, the amount of materials which have been examined for this report, and which now mostly belong to the State Cabinet in Springfield, are extensive and of great value.
Calypso was a very good one for the judge, which I would not place the
Calypso." A Little Commentaries, Mr. A. Parry, is clearly allied to, if not
identical with, Neoptolemus, or to German, for III. p. XII, which is a Calypso
and it will be easier to prove it. I
its only known fact alone allows the general, turned upward, and is very
circular of the neck, the anterior profile of the penna long
gradually narrowed to an obtuse point and the outlet not firmly
pinioned by the rami. The result are also much closer now, numer:
ize and more distinct. This is for different form. Neoptolemus, or to Fig.

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1. Callathytes, now I do not think that of may be compared to Convolvulus, though the nomenclature may be somewhat different. The lateral veins are not very much curved, either very thick as by inflation of the epidermis, similar to that which is exhibited upon those of Nuphar, or very thin and flinty where the epidermis is destitute, both these forms or characters are marked upon fig. 3 & 5 as enlarged of the Callathytes plate. The leaflet we at first thought near the bow or disposed to the base, and then their base bow is slightly curved inward, though really reflex. The characters, therefore, are very similar to the ones described, and illustrated in the Fichet-Verneuil and Hæsthenæus.

2. Callathytes membranaceous, (P. XVII.) fig. 4 & 7. Fringed poly flora, the primary nerves, or nerves divided into fibrils, simple, oblong or undulate, base formed in the arch or slightly turned upward, entire, attached to the costa by their whole length, either joined at the base or separated and then they diffuse slightly rounded at both ends, at the base. The leaflet, average thickness, fourteen million long and eight mill broad, or as is 6 to 1, the primary nerves are divided in pairs, though slightly longer intervals. The bow, one entire leaflet (fig. 1) is supported by the whole base rounded at both ends of the base of the leaf, the central vertical, or the same, alternate, oblique, and equal. It is observed that the leaflet, becoming the marked in passing up toward the point and the upper nerves, become more, 6 or 5 by half. The primary leaflet divided into the primary nerve, being similar to various length, serrated, and then the leaflet, entire, serrate, might become more and smaller in the upper part of the leaflet. All these characters are exactly portrayed, and the nervelet, evidently, of Callathytes. The nomenclature when the pressure, an leaflet, is or not seen at all even closely, except in the edge, but when the leaflet is contracted, with the tongue, it seems black and then become perfectly distinct, through the reddish transparent middle line of the leaflet. The nervelet, or nerve, or the leaflet is enlarged and is exactly as seen upon the leaflet of 5 5 o. This might be my thought and abruptly terminated toward the point of the leaflet, as in 5 5 enlarged. This appears to be a character of Callathytes. We have, I think, to preserve it and to include in it P. Villarot: And the nomenclature should be amended. Remind that the leaflet represents the leaflet of 5 o. when seen in its point, and that the enlarging part, between the points, as seen enlarged, double when moistened, and gallows.
MEDICAL CASE REPORT

A case of unusual clinical presentation and diagnostic challenge is hereby reported. The patient, a 25-year-old male, presented with a 6-month history of persistent lower abdominal pain and intermittent fever. Physical examination revealed a palpable mass in the left abdominal quadrant.

Laboratory investigations showed a markedly elevated white blood cell count with a left shift and elevated liver enzymes. An abdominal computed tomography scan demonstrated a large, heterogeneous mass involving the left liver lobe. Biopsy results confirmed the presence of a highly malignant tumor.

Further genetic testing revealed mutations in the tumor suppressor gene TP53, characteristic of certain types of liver cancer. The patient was diagnosed with hepatocellular carcinoma and was referred for chemotherapy.

The patient underwent several cycles of chemotherapy, during which significant pain relief was noted. However, the mass did not respond well to treatment. The patient's condition remained stable, but the prognosis was grim due to the advanced stage of the disease.

This case highlights the importance of thorough diagnostic evaluation and the role of genetic testing in the management of patients with unusual presentations of malignancies. Early detection and appropriate treatment are crucial for improving outcomes in such cases.
General remarks on ferns.

1. To see difficulties of comparing them to the same time, Ones on
Grand Cayman, p. 3. (2) On the large fruits of Calopteris and
Oleander (same page (2).

2. The stigmas, species to be named, Fig. 3. p. 54. in comes from a large, lox-
son in red brownish orange, feet long than the Calopteris, which
is already describing the plant. The leaves to the herb, e.g. in
the membranous. Some in the middle broad, deciduous, decidu-
ously branching. The branches also the hystomone. The ultimate leaf, partly
sometime of thin appearing branch. The last division an entire thought
in curved petals. The leaves in the middle and combine to whole.

Flesh of the stem is broken and a few, so that if not, one see
this appear evidently, although the Saccoidal pivotal, but more
unusually related to them than any other plant I have been. It may
be compared to a Saccoid (of 1/4 to 1/2).
FUCOIDES, OR MARINE PLANTS.


Frond cartilaginous; stem filiform, dichotomous; branches cylindrical.

Chondrites Colletti, Sp. nov.

Frond large, dividing fan-like into numerous crowded branches, dichotomous, either diverging on both sides of the main axis or arched on one side; ultimate divisions simple, linear, cylindrical, with irregular borders.

This species is not as yet satisfactorily known. I have but recently received from Mr. John Collett, Eugene, Ind., some specimens of a black, fossiliferous limestone, whose surface is marked with the remains of these plants, true Fucoides. The species distantly resembles, by the curving of its branches, Fucoides cauda galli, Van. But it is evidently a compound of separate branches, dichotomous from near the base of the frond (the base is broken from the specimen), the branches in dividing and ascending, forming fan-like or flabellate fronds. The branches, which are ultimately simple, leave upon the stone a half cylindrical impression, and are distinct from each other. The locality is indicated as Towle's mill, five miles east of Lodi, Ind., and the geological position about the level of coal No. 1 of the Ill. section. If it is so, this black
fossiliferous limestone, whose characters are so much like those of the Penna. black limestone seen at the top of the millstone grit with Caulerpites marginatus, Lesq., Jour. Am. Phil. Soc., vol. 13, p. 313, occupies the same level. This is a peculiar coincidence of a singular formation, which, exceptionally in the flora of the Coal Measures, contains Fucoides, in both the coal basins of Penna. and of Illinois.

FRONDS AND BRANCHES OF FERNS.

Genus Neuropteris, Brgt.

This genus, limited as it is, vol. ii, p. 427 of this Report contains some species, whose leaflets, more generally round, have no distinct medial nerve, and which, from this peculiarity of form and nervation, are referable to the genus Nephropteris, Brgt., already a modification or subdivision of the genus Cyclopteris, of the same author. As some of our species are represented, even on the same specimens, by fronds bearing both oblong leaflets with a well marked medial nerve, and nearly round ones without it; or by branches bearing round or polyform pinnules with a definite medial nerve, and oblong ones without a trace of it, the subdivision of the genus Neuropteris is as difficult as it is inconvenient, with the materials now at hand. This opinion is further supported by the descriptions and figures of some of our species.

Neuropteris hirsuta, Lesq.

Boston Jour. of Nat. Hist., 1854; State Geol. Rept. of Penna., p. 837, Pl. iii, 6f, Pl. iv, fig. 1 to 16, excl. syn.

The degree of relation of this species with Neuropteris cordata, Brgt., is not yet ascertained. In his admirable work on the Fossil Flora of the Permian (1864-65) p. 100, Pl. xi, fig. 1 and 2, Prof. Goppert has published as Neuropteris cordata, Brgt., part of a pinna, bearing on one side of its broad rachis a series of alternate, oblong, cordate, obtuse leaflets, one inch broad, four inches long, marked with a thick medial nerve, and on the other side diminutive leaflets, very short and enlarged, resembling, according to the author's remarks, some of those of the polymorphous Neuropteris auriculata, Brgt. If the true Neuropteris cordata has such leaflets of various forms alternately attached to a
Nepenthes hirsuta. See note on the plants of this genus, p. 500. — Our specimen of N. hirsuta, which we observed on the upper surface of the leaf, and under the peristome, is from the coast of India. The plant is a small one, the leaves being very short and broad, and the peristome also small and rounded. The flowers are small, and the sepals and petals are pink, with a greenish tinge. The fruit is a small, round, green berry, and the seeds are black. The plant is a very scarce one, and is only known to have been collected in the highlands of the Lepanto Range. It is a very peculiar plant, and is very difficult to grow. The leaves are very small, and the peristome is very short, and the sepals and petals are very small. The fruit is a small, round, green berry, and the seeds are black. The plant is a very scarce one, and is only known to have been collected in the highlands of the Lepanto Range.

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n-oyy

The whole length and breadth of the figure is tolerably regular, and of the same proportion as in the original. The officers are perfectly drawn, and the whole length and breadth of the figure, as far as the eye can perceive, is tolerably regular. The heads are all drawn with equal care, and the expressions of the persons are perfectly natural. The officers and men are all drawn with equal care, and the expressions of the persons are perfectly natural.

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(2) \textit{Neumann} anomalous, day another the first mentioned the same locality.

They mountain below Fontane 1568 represent the species still under a different form. It is a Funeral, 12 cent. long, narrow, lanceolate, and

outermost, terminal portion. It is still long, narrow, lanceolate, and narrow, a little more than one and broad, long, comparatively long, three and the leaves about five, all undulated upon the border, even undulated, bent toward the lip, or seen from a detached leaf at the base of the column. In this

species, the leaves on the dorsal side, forming one or more generally

formed of two thin parallel-filaments, which form a more or

part of the leaf at first and denote forming a kind of anomalous

movement like that mentioned for \textit{Necker}.

The necer appears somewhat related to \textit{Necker}.

In \textit{Necker} 1568, the leaf is very open, nearly a right angle to the leaf, slender, divided, and narrow, one

wide, broad at the base, which is slightly enlarged in width.

On the long side, pilose, pubescent, micrometers, broad at the point, where they are held by the anterior leaves.

The size, in fact, resembles or very gradually

narrowed upward. The outer leaves, undulate, involute at the summit, the column

nearly divided, the micrometers, and enclosed at the base and in some leaves

the next to above, the median, and in others, it is (the product) not visible at all, being flattened and its place filled by a few parallel rows.

\textit{Necker} accommodates itself. A small species. No. 324 is exactly the same, as figured in \textit{Genera P. V.}, the upper part of a stem.
Nymphopes indica. The opening of the cephalothorax along the median suture appears to be a permanent and valuable character of this species. It is in the form of a line which runs from the middle of the cephalothorax to the posterior end. The line is not as distinct as in some other species, but it is still visible. The cephalothorax is somewhat flattened, with a slight depression in the middle of the lower surface. The carapace is also divided into two distinct parts, the upper one being larger and more prominent than the lower one. The species is generally elongated and slender, with a tapering appearance. The cephalothorax is brown, with a more or less distinct line dividing it into two parts. The abdomen is reddish-brown, with a slight sheen. The legs are long and slender, with six pairs in total. The species is found in moist, shaded areas, and is known for its ability to climb trees and other vegetation. The nymphs are typically found in the underbrush of forests, where they feed on small insects and other organic matter. The adults are typically found in the same areas, but may also be found in more open areas. The species is commonly found in North America and Europe, and is known for its distinctive appearance and behavior.
Goripolites Schloenb. Vol. 1, p. 541. After his description, the author remarks on the absence of such a section, and on the impossibility of establishing characters from the fact that in certain genera we find such sections at the top. It cannot be an American species, as it is not so common with Tertiary species. It differs in many ways from the American forms in the lower part of the series. The specimens described by J. C. Dana in 1848, from which the figure of the species is taken, are much more perfect than those described by H. S. Clark, who gives the name to this species. The new species are placed in the last class of the group.

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References: Schloenb. Vol. 1, p. 465. See for description of the genus and of the species Goripolites. Morris & Richardson, 1848. This new form is placed in the last class of the group.
Genus not mentioned in the Ab. Inst. Report - Trav. spec. 357


Adiantites species: Adiantites sp. 1, Adiantites sp. 2, Adiantites sp. 3. See description for details.

Note: The text appears to be a continuation of a scientific description, likely of a botanical species, but the specific content is not fully clear due to the nature of the image.
Athelstane, therefore, has reviewed the spire, and compared with all the figures
given of Calixtus's universe, in which Athelstane often the Calixtus. Indeed he has declared,
that the spire, at its distinctness, attached to the nave, and if the spire is
now spire, indeed, however, may not be the case. They want all the more even from
the nave, but it is always hanging from the model. The spire has nothing of a Calixtus
but in Athelstane. In view of Campanella, behind from new town sometimes one of the branches, as also from the model. D'Arcy has
remarked this only upon a spire, only in one plate, of a plant, and near the point of the spire. It certainly a good spire. How is that I have
remarked upon p. 352 (3). I am cumulate in 259 appr. to be a spire, and I take to be a good spire. It is a spire, and a spire, on which does not seem.
Ultimol, but also a firm and strong plant. That is, if only the spire may be at the same time and the other spire is very much confident. p. 260 is a fleeting plant perhaps referable to the

3. Composites to new page. See p. 351 (3) 351. a small brown or brown
spire with short other spires. The spire is mentioned near the slightly
document base with thin metal and terms in the spire, and comes from
above the bow, and appears even downwards. May be described by Calixtus?

[Signature: Ag of God our Spirit, G. C. (sic) B.)

[Signature: 572. Dench.]

very well with the money.” p. 350 (3) and top of 351. The money is not small
with separated, from a spire, either in linear other, but in the ale. I'm not
concerned. It is not a small thing which is not a small thing which does not
behave as it 12 cent. I think it is 12 cent. There are all small, a spire may

exp. (sic) p. 350 (3) and p. 351. The money is not small
with separated, from a spire, either in linear other, but in the ale. I'm not
concerned. It is not a small thing which is not a small thing which does not
behave as it 12 cent. I think it is 12 cent. There are all small, a spire may

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behave as it 12 cent. I think it is 12 cent. There are all small, a spire may
Ronpiaculue. B. & L. J. (long, char, name) 88 4 5 6 8 7 8 8 9 10 8. 8 1 million.

1. Fragment of a flange, truncate to the point. Of the fragment marking, linear, somewhat open, much as right and left the same, thicker, narrower, & 18 million long. 5 to 6 million broad, filling about one of then spaces, or the bar and rail sometimes found in the border to near the top of the impression all along, med. left or head flat, extending to the upper border near 11 to 14. Third, in acute angle, the protub., curved, not straight, parallel. Not the simplest or the largest leaflet, the two, lower part, paralleling vertical projection. On appearance of the piece, 1st different from that of the two others, and, recall the form of Callipterus, of shape, only the vein, instead of being curved outside, are distinctly curved wide in the large half, and nearly straight, but in acute angle first small one. This two species, with thick incurved leaflet is from the subcarboniferous.

2. F. M. (not figured). The part from the third med. 14th to 15th, three of the upper half of the leaflet vary distinctly curved 12 & 15 times, there of the other or lower half more straight. The figure, are good representation of the two previous one.
Cuscuta est un membre de la famille des Convolvulaceae. Les spécimens observés dans le Muséum ne ressemblent pas à Calamite, sauf par les tubes annexés ou pseudo-branches, qui sont de couleur jaune-vert. Les tubes sont de longueur variable, mais les plus courtes mesurent environ 1 cm. Les pseudo-branches sont disposées de manière alternée sur la tige principale. Les spécimens ont été observés dans l'optique de recherches sur l'évolution des plantes. Les tubes sont plus ou moins rigides, avec des ramifications secondaires. Les tubes sont fins et flexibles, avec une texture veloutée. Les pseudo-branches sont plus épais et plus solides. Les spécimens ont été observés dans des sites de croissance variés, tels que des sols sablonneux, des zones humides ou des habitats côtiers. Les tubes et les pseudo-branches sont particulièrement adaptés à la vie dans ces environnements, en raison de leur résistance à l'humidité. Les spécimens ont été étudiés en détail pour comprendre leur mode de vie et leur évolution phylogénétique. Les recherches sur ces spécimens ont permis de mieux comprendre les adaptations des plantes à différents milieux de vie.
The discussion on the occurrence of different species of Calamites and their characteristics continues in the text. The author mentions the presence of Calamites in certain areas and their variations in appearance and morphology. The text discusses the importance of identifying different species based on specific characteristics such as the shape and size of the spores and the structure of the leaf-like structures (pinnules).

The text also touches upon the potential uses of Calamites, such as their role in paleoecology and paleobotany, and how they can provide insights into ancient climates and environments. It highlights the significance of studying these ancient plants to better understand the history of Earth's ecosystems and the environmental conditions of the past.

The author provides detailed descriptions of various species, using vivid language to convey the intricacies of these ancient plants. The text is rich in scientific terminology and detailed observations, making it a valuable resource for those interested in the study of prehistoric life forms.
And pitchers in shrubs. The pitcher has numerous specimens of the
species, especially two nodules. It is a narrowly triangular, about 3 inches
wide, bearing on the axis of a long conical leaf-like bract, with prominent midrib
alternating in opposite-rows. The perianth is apparently formed of a number of tubular
placoids upon each other and containing seeds. This seems by least indication by image
intervals, which are seen in the internal part of the horizontally, rather nuclei. I think
that by cutting and polishing these nuclei can be studied, and the internal anatomy,
replaced with the microscope. I can not compare details with these specimens,
but they appear to represent the same species. Dr. J. E. Herder specimens from
Jervis Bay, in a surround of pointed scale. The joint, passing the ovule
a very fine frayed nodule of apparently the same species, and upon a modulation
May reveal the two kinds of nes, just alike what Shaw named in the 1st. At the
extant. 742. 71. 29. 6 to 9. In this I have longer studied with apparent a single
side lanceolate of the scale, retained upon a long bract, the other lower short parallel
may come with umbilicate or to be eaten scales. The same species in the same
represent by the other, you men, and the agent of this set to probably refer to it.
I find nothing in his name in relation to this. He, and the geomet, Schultes set 1938.
In the genus intiates affinities of the Conifers, and quoted the synonyme, Austria, Geum
of Daily origin. See Bal. reg. 1380.

From the observations of Grand Pyer and of Goldner (see ibid, 13. 1362)
the pitch in the floor of Bleakley. See also Manning's Grand Pyer 1714.
15. (1)
1. Another, the Pithera, L. A. M. is represented perfectly identical in three branches
of the same tree. N. 257, 452, 153. They exactly agree with L. H. D. figs.
1 Araucaria excelsa. Form. 71. 33 p. 1. When three specimens, A. j, which represent the genus, but though the specimens are better than those figured by Germain, they do not positively show if the division of the branches are opening forms of fern or filaments as figured by Germain. The secondary fern in our specimen has still more twirled forms and rather seem referable to some fern-like fern.
Gyrophila angustifolia. Dr. B., to whose kindness we owe the following description, has not seen the plant in its natural state, but is well acquainted with the species. 

Gyrophila angustifolia. Dr. B., to whose kindness we owe the following description, has not seen the plant in its natural state, but is well acquainted with the species. 

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Gyrophyla
5. Nootka: The species Di. 32 from Nootka Island appears to form a distinct group, differing from the others in the type and size of the leaves. It is characterized by broad, ovate leaves with a distinct margin and a distinctive flower arrangement. The leaves are larger and more elongated than in other species. The name Di. 32 is proposed for this new species. (280)

6. Cordata: As described in the text, the species Di. 32 is characterized by its large, ovate leaves with a distinct margin and a distinctive flower arrangement. The leaves are larger and more elongated than in other species. The name Di. 32 is proposed for this new species. (280)

7. Plate 5: Figure 9, 12, and 15. The figures show the distinctive features of the leaves and flowers of the species. The leaves are generally larger and more elongated than in other species. The flowers are characterized by their size and shape. The species is proposed for the name Di. 32. (280)

8. Text continued...
Cardaria, Buschmanni. Herb. No. 90. Two specimens from Maine field represent this species as described by Cador. One of the species, 90. is the base marked with circular punch holes, small leaves are indicated as characteristic of the genus in S. E. No. 561. The leaves of the leaf represented by another specimen is split and others. If these are normally as described by Cador, the leaves are more or less separated from the leaf, leaf in this species, and only the then exposing the vein, appears, all in the same leaf. The leaf of the specimen appear as separate veins, and of the same. The base of the plant is more or less parallel veins, present in the same leaf. This makes a great deal of difference and variety in the same leaf. The leaf, with round dots, or rather. The leaves of the plant, after the method shown or precisely a bat. The leaves, where the base is preserved (121) or figured between the leaves, whereas the base is preserved (120) or figured between the leaves, whereas the base is preserved (120).

2. Cador. T. 79. 359. in appr. the year described and figured by D'Arcy.

3. Cador. T. 40. 360. is Jon. The leaves are comparatively short, narrowed from a round a very other somewhat inflated round to the base 1 and broad, while at the point it is 1 24 millimeters. The longitudinal stems, they tend, allow and comparatively angular.

Cador, March. App. New Years' elongated. (The specimen I have received from Thorns, 1706) showing is branch often, 17 centimeters long, eight millimeter broad or three at the base, and four or five at the tip. The stem or pecchio is covered by a small pulular of color, one millimeter thick about when the base is regular, compressed, at the base has dilated with the longitudinal funnels. The leaves are close, at least 17.9. One of the leaves is very angularly divided with a one and one-half millimeters between them. As in the leaves, by a slight curve, the protruded part of the leaf or in right angle to the stem is turned backward from the point of attachment. Narrow, one millimeter broad above the point of attachment which is only two and one-half millimeters broad, it becoming half the stem, enlarging very gradually toward the point where they are and cut broad. This occurs, in the preserved center of 9 cut, only one quarter of the stem, and there slightly inclined. They are generally covered with a leaf, epiphragm which however is not easily detected. The leaves is very closely, very closely, elongated, the base and pointed. The stem is very angular and much. The central veins being distinct, reach one millimeter separated by more than at the three very close distances. The oblong terminal leaves at the tip may be considered a character of this species, which, by its size, with leaves separated by longitudinal veins is repeated in the present figured by D'Arcy.

Cador. T. 44. 357. p. 165. in appr. the year described and figured by D'Arcy.

These figures from one plant are slightly different. Comparing this Cador. T. 44. 357. with the Cador. T. 40. 360. which is much nearer a figure of Cador. T. 79. 359. It is easily seen that the characters of each plant are different. Comparing the Cador. T. 44. 357. with the Cador. T. 40. 360. which is much nearer a figure of Cador. T. 79. 359. It is easily seen that the characters of each plant are different.
In the cabin of the Mary J. there was one of this spec. 1/2 and one fourth
and one half broad, not an am, apparently narrow.
1. Lecanopteris. This genus is well described by Schmer, and its place, at least cons[idering] its running, the form of its pinnule and their division, in between the Littopteris and the Althopteris. To this genus may be added probably Althopteris silvatica, on account of the running at least and any other Lecanopteris. Pander describes a species which has a running in perfect concordance to that of Lecanopteris. More or half Althopteris, half Littopteris.斐侠

As the essential character is the running, the secondary veins, of the base of the pinnules, going on by the rachis and curving to the border, the other from a narrow notch, in an acute angle of divergence, curving toward the border and dichotomy, pulling once or twice as in the Lecanopteris, and joining the borders nearly at right angles to them. So the genus may be added.

2. Lecanopteris. Mansfeldi sp. nov. Frim as large; the signia upper part of the pinnule is 12½ cent. long, 3½ cent. broad from the middle to the base, lanceolate gradually narrowed to the point, pinnately divided or oblong, others open pinnules 1½ to 2 cent. long 6 to 7 mill. broad toward the base, when they are joined to a very acute sinner, the border of the costa, after curving or joined from the middle to the base, oblong shaped or curved oblique middle near thin, dissolving below the point top of the pinnule; secondary vein at an acute angle of divergence, curving in pinnule to the border, rarely simple, generally forming two rarely more, reaching the border in right angle, their bases from the rachis which is narrow as channelled in the middle. The pinnule has a remarkable analogy to L. Panderi, but differ by its connivence, which is thinner and not covered by the thinner, close secondary veins. The difference is not great.
Leptoceras Comand. This genus appears to be preceeded for the third of 2222 Epoxyres. I have described in the Penn. Flora Report, p. 276 once the name of Bradychlamys. By two species recently discovered, p. 186 (18), it seems like these apparently represent peculiarly fruits in long-grape, or cylindrical corollas apparently broad capsules or seeds, containing 140. One spec. is described in this vol. p. 463 (18), under the name of Carpolith, umbellata and figured in my plates, another in the Geol. Rep. of Penn. Vol. I. as Bradychlamys atrovarum, and one or two others are represented by specimens recently discovered.

The character of the genus may be described as follows: long fruit bearing, calyx or sepals, linear, flat or cylindrical, hairy, 

3. Leptoceras quadrangularis, Br. & Br. Heads narrow half-a 

1. Leptoceras umbellata var. var., the one described p. 463 (18), p. 366.

2. Leptoceras quadrangularis, Br. & Br. Heads narrow half-a 

3. Leptoceras quadrangularis, Br. & Br. Heads narrow half-a 

4. Leptoceras quadrangularis, Br. & Br. Heads narrow half-a
Despite corpus indicati. [text obscured]...
Spinesque. The main aggregation of spines is thus constituted together without any apparent mutual action. We turn to Mr. Smith and to a mass of spines, either vertical or horizontal rows. The spines, comparatively large, do not fit to the matrix, as if...

1. Spinesque, quad. An. 1296, 243, 241, 721. Of these you may see

...a mass of spines, either vertical or horizontal rows. The spines, comparatively large, do not fit to the matrix, as if...

2. Spinesque, quad. An. 303, 303, 309, 314. Of these spines, large, in an oval group, twice as large as that of the former species, 126 by 50. They have a smooth, metal-like appearance, and a compact arrangement which makes them feel tough mud in diameter, uncalculated for...

Similar to species...

3. ...specimen, No. 291. Of these specimens, aggregation...they may be observed whether... They may be observed whether... They may be observed whether...

4. Spinesque, quad. An. 291. Of these specimens, aggregation...They may be observed whether... They may be observed whether...

5. Spinesque, quad. An. 291. Of these specimens, aggregation...They may be observed whether... They may be observed whether...
(1) Specisc plantes, &c. See vol. i. 367 (1) and vol. ii. 239. We here have  
the great men representing the species. An capsule, before quire. On quire,  
the surface, which is very great, filled by  
companion. Before the need of the, which is clean. Another  
by the deeper, which is the same.  
The capsule which the surface are sensuous.  
A capsule, and part the surface, are sensuous.  
A capsule, and surface, are sensuous.  
A capsule, containing seeds? or spores? Did a. or, the capsule, and  
part the surface, are sensuous.
Bona.

Bonic radulae, a good size specimen from hand cut, represents this species, at least a Bonic, as the genus is described by Schimper. The articulate are distant, the ribs comparatively large, often with the thins between, most deeply marked. The space from the surface of the central axis is about an half centimeter. The central axes is throns like the surface, but its width is not seen in the same manner in the length parallel to its border. The ordit part seen is 7 millim.

There's in the cabinet a large 250 a tablimentum, representing a specimen from the calc. 5 mud, long, 5 mud breadth, 5 mud inclination 91, and distance being 30. 100 bonit, but not less than, one small bush 91 each, long, draw very other. Sometime curved inward, but not much. Shall nearly round a point, a flat, noth resembling. The figure 2 of Bonic radulae given in things other. XXV. 8 bush appearing, as uniting. In approach, two legs at the base. I have no doubt that similar to the same species.
Colaminaria, 

Colaminaria fijpœsis. Schr. 173. 322. Als Wellkame raeisse. 185. 

p. 52. P. XV. p. 1. 3. Alse blanco, flatalent: half centimeter broad 
distinctly regular flattened with flat slightly linear comparatively broad ends. 
articulate a little more than one centimeter distant, not triangular 
compressed near-inflated. leaves once, often half divided, narrow, near 
millimeters, nearly flat or slightly curved with the surface opaque without 
free of medullary nerve. Three centimeters long and narrow 16-30. reach 
thread gradually narrowed to a slighter other point. Feet foot long 
off one name character, articulation, half centimeter distant, with green line vertical. 
Players torn open a short red claws, nearly two millimeters long cylindrical 
half centimeters in diameter, even, centimeters long lying on the back of 
articulate leaves, and evenly separated, two millimeters, long nearly as broad, toward 
the apex, space between the powerful articulates 2½ millimeters. Some patients 
open at base, curved upward, form the base, enveloping the musette, half cylindrical. 
The branch 

which is inflated at its base, point of attachment to the stem, then 
der by more of these leaves. The stem of the base appears distinct, 
or on both sides of the branch. The articulation often is rendered or attached 
to the counterpart of the plates. The space of the point of attachment of the 
leaf is distinctively seen upon the articulation. Very narrow with the center 3½ up.
1. Calamites approximatus, Schott. A few specimens in J. F. Manheld's collection. Mr. S. L. J.
represented a mean only 3½ in. broad, with articulation 2 inches below. He observed, in the upper part, inflated at the articulation, which are obliquely smashed and curved with the stem smashed upon the articulation, in broadly oval or rather round, enlarged on the side &
arm branches and placed in an annulus or to form a
articulated bed of articulation. They occur in 15 million broad acres
6 mill high. They were exactly aligned, with lecithous deposits in Oct. No.
1. 2. 3. 4. 5. and also with 6. 4. 5. 2. 3. 4. 5. 6. 4. 5.
They are correlated with the same character, as the previous ones. This is Cal. Uncinate, No. 1. 1. 2. 3.
2. 3. 4. 5. 6. 4. 5. 3. 4. 5. 6. 4. 5. 2. 3.
3. 2. 3. 4. 5. 6. 4. 5. 2. 3.
4. 5. 6. 4. 5. 3. 4. 5. 2.
5. 6. 4. 5. 3. 4. 5. 2.
6. 5. 4. 3. 2.
7. 6. 5. 4. 3. 2.
8. 5. 4. 3. 2.
9. 6. 5. 4. 3. 2.
10. 5. 4. 3. 2.
11. 6. 5. 4. 3. 2.
12. 5. 4. 3. 2.
13. 6. 5. 4. 3. 2.
14. 5. 4. 3. 2.
15. 6. 5. 4. 3. 2.
16. 5. 4. 3. 2.
17. 6. 5. 4. 3. 2.
18. 5. 4. 3. 2.
19. 6. 5. 4. 3. 2.
20. 5. 4. 3. 2.
21. 6. 5. 4. 3. 2.
22. 5. 4. 3. 2.
23. 6. 5. 4. 3. 2.
24. 5. 4. 3. 2.
25. 6. 5. 4. 3. 2.
26. 5. 4. 3. 2.
27. 6. 5. 4. 3. 2.
28. 5. 4. 3. 2.
29. 6. 5. 4. 3. 2.
30. 5. 4. 3. 2.
31. 6. 5. 4. 3. 2.
32. 5. 4. 3. 2.
33. 6. 5. 4. 3. 2.
34. 5. 4. 3. 2.
35. 6. 5. 4. 3. 2.
36. 5. 4. 3. 2.
37. 6. 5. 4. 3. 2.
38. 5. 4. 3. 2.
39. 6. 5. 4. 3. 2.
40. 5. 4. 3. 2.
41. 6. 5. 4. 3. 2.
42. 5. 4. 3. 2.
43. 6. 5. 4. 3. 2.
44. 5. 4. 3. 2.
45. 6. 5. 4. 3. 2.
46. 5. 4. 3. 2.
47. 6. 5. 4. 3. 2.
48. 5. 4. 3. 2.
49. 6. 5. 4. 3. 2.
50. 5. 4. 3. 2.
51. 6. 5. 4. 3. 2.
52. 5. 4. 3. 2.
53. 6. 5. 4. 3. 2.
54. 5. 4. 3. 2.
55. 6. 5. 4. 3. 2.
56. 5. 4. 3. 2.
57. 6. 5. 4. 3. 2.
58. 5. 4. 3. 2.
59. 6. 5. 4. 3. 2.
60. 5. 4. 3. 2.
61. 6. 5. 4. 3. 2.
62. 5. 4. 3. 2.
63. 6. 5. 4. 3. 2.
64. 5. 4. 3. 2.
65. 6. 5. 4. 3. 2.
66. 5. 4. 3. 2.
67. 6. 5. 4. 3. 2.
68. 5. 4. 3. 2.
69. 6. 5. 4. 3. 2.
70. 5. 4. 3. 2.
71. 6. 5. 4. 3. 2.
72. 5. 4. 3. 2.
73. 6. 5. 4. 3. 2.
74. 5. 4. 3. 2.
75. 6. 5. 4. 3. 2.
76. 5. 4. 3. 2.
77. 6. 5. 4. 3. 2.
78. 5. 4. 3. 2.
79. 6. 5. 4. 3. 2.
80. 5. 4. 3. 2.
372.

Penecon from Connemara, No. 358. A thin 48 and cent long, 7 1/2 cent. broad flat, with only three articulations. In flat, broad 2 1/3 millon, with an outside valve. The valve is blunt. They were cut with a thin coating of coal. A tear along one of the articulations on the valve, visible to the eye, nearly 10 cent long, without articulation. The valve divided in the upper part, both gradually narrowed to the peril line. The valve having been desicated in the natural position when its only. I found two valves, one in the upper part at the articulation, nearly united. The bone articulation as then marked with an oval mamilla but the both both, except in brochades — see, in the C. Ramus. But, as described by Grand' Euy, it is exactly the same as the species, and, should be measured as a species.

1) Calamites subflavus, L. D. This is a good species, evidently, the same as has been described by Grand' Euy as 181 with wood cut. I have never seen it from Connemara and other localities, Milford, &c. below.

1) Calamites Caninaformis? Duf. I can not indeed suspect this from a rather small-vein, the C. caninaformis, or C. helvica. Both upon which, that the neck of the leaf, the 2 1/4 and long, 3 1/4 cent broad flattened to the 1 cent, has the articulation, 2 by 2 cent long. The leaf, the 1/3 or 1/4 cent long. 3 1/4 cent. larger than any other mamilla, convex or concave, near the division of the mamilla, or all placed at the top. The cortex, before being much inflated at the cortex inflation. The cortex at the base, in the integral, 1 1/4 cent, and then the leaf, in the length, the leaf leaf, sometimes, 1/4 cent, cut in 1/8 of the leaf.

3) Calamites Caninaformis? Duf. I can see in the document, that species, a rather small-vein, the C. caninaformis, or C. helvica. Both upon which, that the neck of the leaf, the 2 1/4 and long, 3 1/4 cent broad flattened to the 1 cent, has the articulation, 2 by 2 cent long. The leaf, the 1/3 or 1/4 cent long. 3 1/4 cent. larger than any other mamilla, convex or concave, near the division of the mamilla, or all placed at the top. The cortex, before being much inflated at the cortex inflation. The cortex at the base, in the integral, 1 1/4 cent, and then the leaf, in the length, the leaf leaf, sometimes, 1/4 cent, cut in 1/8 of the leaf.

3) Calamites Caninaformis? Duf. I can see in the document, that species, a rather small-vein, the C. caninaformis, or C. helvica. Both upon which, that the neck of the leaf, the 2 1/4 and long, 3 1/4 cent broad flattened to the 1 cent, has the articulation, 2 by 2 cent long. The leaf, the 1/3 or 1/4 cent long. 3 1/4 cent. larger than any other mamilla, convex or concave, near the division of the mamilla, or all placed at the top. The cortex, before being much inflated at the cortex inflation. The cortex at the base, in the integral, 1 1/4 cent, and then the leaf, in the length, the leaf leaf, sometimes, 1/4 cent, cut in 1/8 of the leaf.
FOSSIL PLANTS.

common rachis, as Goppert describes, our *Neuropteris hirsuta* is certainly not identical with it. For this very common and polymorphous species of ours, whose frond is sometimes 5 feet long, and at least tripinnate, and generally bears compound tertiary alternate pinnae or pinnules formed of a large oblong or lanceolate obtuse leaflet, cordiform at base, having on each side, and attached to the base of its slightly elongated pedicel, a small round or veniform pinnule, which is as different in its form as in its nervation from the main middle leaflet. This one has generally a well marked, sometimes thick medial nerve, from which the veins go out, anastomosing and curving to the borders; while the veins of the small basilar leaflets all come out of an enlarged or circular base, without trace of a medial nerve. These leaflets are, therefore, true *Nephropteris*, while the main pinnule is a *Neuropteris*. We have obtained from various parts of our Coal Measures, where this species is the most abundant of all, numerous specimens which all show the same characters. The pinnae decrease in size to the point, and the two upper leaflets under the terminal pinnule are simple or do not appear at the base the small round pinnules; all the others are compound. This terminal pinnule is large, round oval, obtuse and entire. On the other side, Prof. F. A. Römer has published in the Palaeographia (1860) p. 186, Pl. 29, fig. 4, a leaf which he considers identical with *Neuropteris cordata*, Brgt., though he calls it *Dictyopteris cordata*. It resembles one large leaflet of *Neuropteris hirsuta* by its form, and by the straight pointed hairs with which its surface is marked. But in the leaf figured by the German author, the veins and veinlets are undulate, and in curving and anastomosing, they pass from one to the other, forming a kind of reticulation, like that which characterizes the genus *Dictyopteris*. As this peculiar mode of reticulation is not remarked in our species, we have to consider it as different from *Neuropteris cordata*, Brgt.

**Neuropteris fasciculata, Sp. nov.**

Pl. v, fig. 1 to 4.

Frond pinnately divided, bearing alternate ovate lanceolate pointed leaflets, variable in size, irregularly rounded or auriculate at the base, being more extended on one side than on the other, or truncate on one side, and rounded on the other. Medial nerve distinct, and comparatively broad, either descending to the point of the leaflets, or disappearing at or below the middle, sometimes absent; veinlets thin, close to each other, scarcely distinct, arched, forking in ascending.
This species, by the divisions of the leaves, presents a truly peculiar appearance, which does not compare with any previously known fossil plants, except perhaps with some of the abnormal forms of Neuropteris hirsuta. It is evidently distinct from this last species, as shown by its smooth (not hairy) surface, its thinner texture, its more closely approached veinlets; by the pointed form and the peculiar division of the leaflets, which are generally united three together, and by a subdivision of the main rachis. In the specimen represented by fig. 3, the large leaflet has a well marked medial nerve, while the small ones have no trace of it. The specimen represented by fig. 4 is creased in the middle, but the secondary nerves come out from the broad, round base, as in the genus Cyclopteris. I consider it as one of the leaflets attached to a round, perhaps climbing stem, while the others represent the top leaves I have only seen of this species the four specimens figured here. Figs. 2 and 3 are from the bottom clay of the upper coal bed of Neelyville, Morgan Co.; the two others in concretions from Mazon creek, Grundy Co.

**Neuropteris Collinsii, Sp. nov.**

Pl. v, fig. 5 and 6.

The mode of division of this species is still unknown, as it has been found as yet only in separate leaflets. These leaflets are large, from two to three inches long, one and a-half to two inches wide, either oval in outline or oblong ovate, and smooth. The veins and veinlets are thin and distinct, inflated near the base, emerging from an oblique or horizontal truncate broad base, many times forking in ascending, and but slightly arched. The leaflets have no trace of a medial nerve, and could not, therefore, be referable to the genus Nephropteris, Brgt.

But as it has been seen to be the case with species of this genus, other leaflets, taken from different parts of the same plant, may have another kind of nervation. Our species is related to Neuropteris ingens, Lind & Hutt., Foss. Flora, vol. 2, Pl. 91a, by the form and size of the leaflets, but it differs by the mode of division of the veins, which do not radiate from one common point, but ascend in slightly curving lines to the borders from an enlarged base, where they become parallel, resembling, in that manner, the nervation of an Odontopteris. In our species also, the veins, though inflated near the base, are not as distinct as in the English species, which is compared to Neuropteris au-
The species is known as such by its characteristic leaf, which is not large, at least as seen from the fruiter, nor is it very broad. The leaf is about 1/4 inch long, with a broad base. It is borne on a short stem, and the leaf blade is oblong, or oval, with a short petiole. The flowers are small, white, and borne on short stalks. The fruits are small, round, and dark blue. The species is found in dry, open areas, such as fields and meadows.

The leaves are used in various ways, such as for making tea or for medicinal purposes. They are also used as a source of fiber for making paper or other products. The fruits are eaten fresh or dried for use in cooking or as a flavoring agent. The species is cultivated in various parts of the world, including Asia and Europe.
1. Neumayer Tom-Tree. Only the portion that we have the space with, about the same part as the Capt. one with the chambers was found and another with the sublobe and then basket.

2. Neumayer Plant. At 11:30 a.m. on Carrington, Penn. Dependent, found another specimen of triangular about 16 cent long with the sublobe and sublobe and at the mouth of this, apparently as reduced the lower part of the bark, and red in the middle three and one half cent long. In the form of a prunelle and obd, the terminal one is the sublobe of the sublobe of the basket. First and foremost, they should be compared with the specimens from other localities, then of the Baskettuch and Turrul red for example.

3. Neumayer Plant. At 11:54 a.m. The two specimens, evidently represent the species, the last exactly like the Ming, the other of a prunelle prunelle, with a more slender stem, opened in the middle, bearing a love of the half round, basket, real love and a half centimeter across, and a top basket, lobed with appendage on the side. How the other in the upper part, with the peculiar relation of the species.

Neumayer. - Number of rarer is one centimeter long. All others:

W. 1903. 30-35. See centimeter.
W. 1904. 32
W. 1905. 30
W. 1906. 30-60.
2. **Kureptus Gramenug**. Fig. 3, p. 41. This specie is mentioned in the description of the last specimen, pp. 237, 239, and is not the one which is described on p. 237, pl. 61, fig. 4. Its green has the isopleth shown as colored. The first of the two forms is the one in which the leaves are long and pointed. The second is one in which the leaf is smaller and the leaves are more rounded.
Neoplamia Loricaria. In the description already made of this genus, page 375, it was said that the figures of the species were not entirely formed. The ground is at least frequently large, laminated, with several kinds of both kinds and unequal; each species alternates, so that the middle has a broad, flat, spiny, oval, or square, point, with a series of bristles on it, and the whole is covered with strong, short, stiff, spines. The small species are much shorter and therefore less distinct. The surface of the bulb is always smooth, but the spines are preserved in some species, and it is not clear why they are wanted. The species are divided into two groups, one of which is the small and another of which is the large. The small species are more distinct from the middle, and especially from the middle species, which are more distinct near the sides and less near the middle. Though these species are marked upon every one of the specimens of the genus, I could not find them in the terminal bulb, but in the large, lateral, or in the species, near the middle species, and more commonly in the species, near the middle species, and in the species, near the middle species. The terminal bulb is not known.
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Neuropteris capitata, Brgt., a plant which has not yet been discovered in our Coal Measures. The two specimens figured in this Report, have been found in the concretions of Mazon creek, the first one, fig. 5, by Mr. John Collins, to whom the species is dedicated. Other and larger leaflets of the same species have been obtained from the same place.

Neuropteris capitata, Sp. nov.

Pl. vii, fig. 1, and Pl. viii, fig. 4, 43.

Frond or part of frond bi-pinnately divided, triangular in outline or tapering upwards from an enlarged base; pinnae linear, with alternate, oblong, short, very obtuse, broad, contiguous pinnules, and a proportionally very large triangular obtusely pointed terminal leaflet, obtusely lobed on each side near its base. Medial nerve, none; veinlets scarcely visible to the naked eye, coming out from the narrowed base of the leaflets, strongly arched towards the borders, with numerous bifurcations. At the upper part, or near the point of the frond, as seen in Pl. vii, fig. 1, the pinnae become shorter, less divided, and at last mere pinnules attached to the rachis by a broad pedicel. All leaflets are unsymmetrical at the base, being auricled or elongated downwards, or toward the main rachis, and merely rounded on the other side.

The general appearance of this species is somewhat similar to that of Neuropteris Loschii, Brgt., from which it is readily distinguished by its proportionally broader, round-topped pinnules, more abruptly cut at the base, its polished smooth surface, and the large terminal triangular leaflet. The large specimen figured is from Murphysborough; the other has been found in concretions at Mazon creek. The same species is abundant in the roof shales of the main four-feet coal bed at Yellow creek, Ohio.
Neuropteris fimbriata, Lesqx.

Pl. vi, fig. 4.

Cyclopteris fimbriata, Lesqx.

This species has also been published in part, and from isolated leaflets, in the Geol. Rep. of Penn., p. 855, Pl. iv., fig. 17 and 18, as a Cyclopteris. The specimens now on hand represent it with a pinnate frond having an undulating, flexuous, round, finely striate rachis, marked with points as if it had been scaly, which bears alternate, distant, broadly oblong or ovate, sometimes nearly round leaflets, entire at the round auriculate base, attached to the rachis by a broad pedicel. These leaflets are finely fringed from the middle upwards by long, undulating, narrow laciniae. The veins which come out parallel from the broad pedicel and divide three or four times in ascending, are thin but distinct, slightly arched towards the borders and ascend to the top of the fringes. The specimen figured here from the concretions of Mazon creek, and found by Mr. S. S. Strong, seems to show that the species was a climbing fern resembling by its nervation and its mode of division a Lygodium. It has been supposed that the fimbriate leaves were the fruiting part of a species, which in its sterile form has entire leaflets, as it happens with some ferns of our time. But the fringe is not inflated, and the laciniae, though very distinct in some specimens, do not show any trace of remains of sporangies. Like the former species, this one is, by its nervation, a Nephropteris, at least so far as it is known. It varies much in the size of its leaflets, some being still smaller than those figured here, while most of the others found detached from the stem, and which are broad oval or nearly round in outline, are about two inches or more in diameter. It is one of the finest and rarest species of our Coal Measures, though it has been found at different places over the whole extent of the N. American coal fields. When this species was first published, no plant of this kind had yet been found in the Coal Measures of Europe, but recently Prof. Heer has given in his *Urwelt der Schweiz*, under the name of Neuropteris lacerata, Heer, l. cit., p. 12, fig. 11, a species which has a near relation to ours. It is a round leaflet, bordered by a narrow fringe, which, unlike ours, is nearly regular with equal narrow divisions. As far as can be seen from a mere woodcut, the species is a truly different one. Prof. W. P. Schimper, in his *Palæontologic vegetale*, seems to consider both species as identical, for he says of Neuropteris *(Cyclopteris)* lacerata, Herr, that it is found at Saarbruck and in some places in North America. If both species are identical, our name has the
The Acorn Fungi include the species commonly found on the forest floor. These fungi are characterized by the presence of a cup-like structure, the acorn, which contains the spores. The acorn is usually brown in color and has a smooth or rough texture. The fungus grows on decaying wood and is typically found in moist, shady environments. The acorns can be easily identified by their distinctive shape and color, making them a key feature in the study of forest fungi.
Nobles and gentlemen! I am now about to state some facts which are...
then from 5 to 10 and long as 1/3 to 1/20 millim. broad at base upon the leaflet, which are nearly round, terminal at base, 3 millim. across, both ways, keen, long serrate and pointed and this leaflet is always about 3 to 20 millim. long. Most of the leaflets are oblong-rounded at top or slightly pointed (fig. 1). The point of the leaflet is almost or nearly equal or very unequal at the base. All the middle leaflets of the species are shorter than the leaflets of the leaf base, which are longer than the leaflets of the leaf base.

When the leaflets are long, 2 or 3, broad, just above the very unequal base, from which point it is gradually narrowed to the leaflet in less than 1/8 of the leaflet.

A synsepal flower, BR. 15, has in the figured specimen No. 1078. from a stem, erect only with five leaflets; surmounts an oblong, obtuse, short persistent, curved, large (anastomosing), with the same mouth of the leaflet, a very expanded, ovate terminal, long, (triangle) acuminate (curved) ovate leaflets, BR. with very thin, entire, stiff, tectorius, (bristly) leaves, a sparsely, with short abscission and figure and bearing an inflated leaflet, just as those of P. 65, fig. 3a, and 3b, considered by BR. a fruit, specimen. Though BR. says of the terminal part that it is a leafless leaflet, the figure shows it enlarged on the middle and lengthwise rhomboidal. The undivided imbricated leaflet, with rows close than in N. 1078, but more divided and closer, forking 4 or 5 into leaflet 3 and long in flabellate toward the base, upon the invariable oblong and with the thin midrib appear as described by BR. In my plate U. S. P. fig. 20, 3, the form of the terminal part is about the same and in some specimens with large pinnus, there are perpendicular to the leaflet and also in fig. 2, the rachis is thin and filiform. But in the leaflet are already, the leaflets forming here, not inflated toward the base. It may be that fig. 2 represents also not undivided, but the terminal filiform, though sub rhomboidal, in the length is varied in 1/3 to 1/20, the leaflets also are generally smaller. In comparing No. 1078, N. 1078, both phys. with large leaflet, all this, distinct and separate, in both find the sum of 1/3 to 1/20, close now divided. They are inflated of 1/2 to 1/3 form, and it is the great division, only which separates them. These three are very much like the fig. 3. flowere, if 1078, and very difficult to separate at least in the middle leaflet of large, shone where the terminal leaflet not right. I have now kept its erigeron from the above group, from the head, representing the mean, with numerous, feathery, the flower, especially flowers toward the base, and the figure, on the flower of the flower, its light, among the leaves, especially when large or Malcolm, spread. The second or third row and with the terminal portion, leaflets, enlarged to the middle, but very other, and this generally covered with the flowers of the terminal leaflet, longer and taller, are mounted on the flower. The character of this species is clearly those Brongniart and described elsewhere. The leaflet, the disting or oblanceolate are obtuse, dark, larger, enlarged, among the base, especially, in the outer side. Many of the flowers represent the shallow, or obtuse, which are supported by short stamens. They are in some very regular, but evidently caused by sub surface or low in surface. In 8 of 9, or in some instances, the flowers or flowers, included in sub surface or low among the flower, when this is not, or low, low light.
Tu/f &

f/h 14

n Jm J/

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fit

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O'YiAs

1. Summary a preliminary note. The description is not quite right. To add
for the position of the lycaste, that they are perpendicular to the axis, exactly near
the top of small perianths (there are three included in each in the small flower of
set out in Fig. 3, which belongs to Launaea indica). And nearly round, flat, and round or
surrounded, to the base, the leaves slightly elongated for the main axis. The
middle three flowers in the borders, slightly more densely, behind, an elongation
of 

3. Description of a new genus. The type is a new and distinct species of the
Corydalis family. The is an important genus in the family, becoming shortly
when mature, and without any other noticeable characters, besides the
characteristic leafy, branched, and leafy flowers. The new species is well
represented by the type, and is the only one known in this genus. The

4. Description of a new species. The following the name, the following

5. Description of a new species. The description is still the same. For the

As a result, the new species is very similar to the type, and is the only one known in this

-term, the name of the type, and is the only one known in this genus. The

As a result, the new species is very similar to the type, and is the only one known in this

As a result, the new species is very similar to the type, and is the only one known in this

As a result, the new species is very similar to the type, and is the only one known in this

As a result, the new species is very similar to the type, and is the only one known in this
FOSSIL PLANTS.

right of precedence, and should be preserved, it having been published, with description, in 1854, in the Journal of the Bost. Soc. Nat. Hist.; and in 1858, in the Report of the Geological Survey of Penna., with figures and description, while Prof. Herr's species was published ten years later.

Neuropteris vermicularis, Lesq.

This species, described in the 4th vol. of the Geol. Report of Kentucky, p. 434, has not before been figured. The frond is apparently tripinnate, with linear lanceolate somewhat obtuse pinnae, and alternate, oblong very obtuse leaflets, placed at a short distance from each other. They are slightly narrowed in the middle, turned upwards or a little scythe-shaped, and nearly round, and equal at the corners of the base. The terminal leaflet, fig. 3, is oblong obtuse, regularly and equally undulate-lobed on both sides. The nervation is particularly distinct, the medial nerve being short and thick, and the veinlets distant, twice forking in curving to the borders, round, deeply marked, easily detached from the substance of the leaves, polished and thus appearing like pieces of rain worms. The main rachis is broad, straight, and irregularly striate.

Found in the concretions of Mazon creek.

Neuropteris verbenefolia, Lesq.

Frond pinnate; rachis round, slightly and regularly striate; leaves alternate, varying in length from half an inch to four inches and a-half, proportionally broad, ovate lanceolate-obtuse in outline, truncate at the base, regularly serrulate-toothed on the borders, attached to the rachis by a broad pedicel, medial nerve narrow but distinct; veinlets distinct and distant, thin, moderately arched in ascending to the borders, forking twice, the last divisions descending to the point of the teeth.
The figure and description given of this species in the 2d vol. of this Report, p. 431, pl. xxxvii, fig. 1, are imperfect, being made from the only specimen found at the time. Better specimens now on hand show that this fern evidently belongs to the genus *Neuropteris*, not only by its nervation, but by its ramification and the position of the leaves on the rachis. The species nearest to this is *Neuropteris crenulata*, Brgr., easily distinguished by its elongated narrower leaves, with crenulate rather than toothed borders, and the thickness of its veinlets. Our fig. 5 represents a specimen whose upper leaflets, scarcely dentate, have the surface wrinkled around, and marked by points of irregular size, placed without order, which resemble traces of fructification, the epidermis appearing as if it had been perforated by glomerules of spores placed under it. This peculiar appearance may result from the process of maceration. It is too obscurely marked to merit more than a passing mention.

**Neuropteris rarinervis**, Bunb.

Pl. viii, fig. 1 to 6.

The specimens figured 1 to 4 on this plate, from the concretions of Mazon creek, bear round leaflets, apparently attached on both sides of a secondary rachis, as are generally the pinnules of a *Neuropteris*. According to this appearance we should have not only to consider these leaves as representing a new species, but also to accept the genus *Nephoteris* or *Cyclopteris* for their classification. But I think that the parts represented in fig. 1 and 2, are not fragments of a secondary pinna with alternate pinnules attached to it, but only parts of primary pinnae with the basilar leaflets of the secondary pinnae attached to them, in the same way as such leaflets are attached along the rachis in fig. 6, which represents a fragment of pinna of *Neuropteris rarinervis*.

This remarkable specimen is also from Mazon creek. As is easily seen, it shows a primary rachis with the base of its divisions marked by the remains of the secondary branches and the two basilar leaflets on each side of them. If these branches were longer, we should see these basilar leaflets more and more enlarged, becoming round farther down, and then showing the same forms as we see on fig. 1 and 2. In vol. 2, p. 429, in a foot-note of this Report, mention is made of a specimen from Newport, R. I., which bears on the same part of a frond two round cyclopteroidal leaflets attached at the axil of secondary pinnae, while the same pinnae bear true neuropteroidal oblong pinnules, with a medial nerve. As this specimen elucidates the position of the two kinds of leaflets, and as it is the only one found as yet elucidating this peculiar difference, I have figured it fig. 5, as affording the most conclusive representation of the unity of both the genera *Neuropteris* and *Nephoteris*. This figure, I
1. Neotrypaea tenuirostris d'Orch. (p. 386). In a very well characterized one. It is represented in the pl. 3 of the Abandoned Eggs of the Sea. The characteristic feature of this species is not quite clear, though somewhat visible in the pl. 3. The species is closely related to the other species of the genus Neotrypaea. The egg is elongated, oval, and about 2 millimeters long. The embryo is well developed, with a distinct yolk sac visible. The species is characterized by a small, dark, oval eye situated at the anterior end of the body. The head is narrow, and the mouth is small, with a single row of teeth. The body is covered with smooth, transparent skin. The species is known to inhabit shallow waters near the coast of the eastern coast of North America. The eggs are laid in clusters, and the larvae hatch within a few days. The specimen is preserved in formalin and is currently housed in the American Museum of Natural History.

2. Neotrypaea Blondi Fig. 8 (p. 387). The species is represented by a single specimen, which is preserved in formalin. The specimen is about 2.5 millimeters long and 1 millimeter wide. The body is elongated, oval, and about 2 millimeters long. The embryo is well developed, with a distinct yolk sac visible. The species is characterized by a small, dark, oval eye situated at the anterior end of the body. The head is narrow, and the mouth is small, with a single row of teeth. The body is covered with smooth, transparent skin. The species is known to inhabit shallow waters near the coast of the eastern coast of North America. The eggs are laid in clusters, and the larvae hatch within a few days. The specimen is preserved in formalin and is currently housed in the American Museum of Natural History.
The terminal leaflet is concolorous with the petiole, and is generally enlarged toward the tip, by the ray embrace, and the
leaflet obliteration of the veins from the major veins, and the leaflet
(small) at small end smaller than in the other leaflets. By the
several protuberances a circular line of the leaflet, and which are
generally enlarged toward the lower, by the ray embrace, and the
ray embrace, and obliteration of the veins from the major veins, and
the leaflet (straight) not evident from the veins, as apparent whenever the
may be
deliberate. The terminal leaflet is concolorous with the petiole, and is
generally enlarged toward the tip, by the ray embrace, and the
leaflet obliteration of the veins from the major veins, and the leaflet
(small) at small end smaller than in the other leaflets. By the
several protuberances a circular line of the leaflet, and which are
generally enlarged toward the lower, by the ray embrace, and the
leaflet obliteration of the veins from the major veins, and the leaflet
(small) at small end smaller than in the other leaflets. By the
several protuberances a circular line of the leaflet, and which are
generally enlarged toward the lower, by the ray embrace, and the
leaflet obliteration of the veins from the major veins, and the leaflet
(small) at small end smaller than in the other leaflets. By the
several protuberances a circular line of the leaflet, and which are

...
1. Newcomer's varvina slug. Of this species I have obtained from Mrs.
D. S. Armstrong of Valley, and from the nodules of Major Creek. I have
seen, which are nearly the third feeding polype, nearly a counterpart of the one
figured here. The formule, which are all alike, and not opposed as in
uniquity, show near the base of the varvina a tendency to become oblate at base.
They turn upward and form the well marked nemert, as in the figure.
Their turn at first is almost at a tangent angle from the third nectral plate
then curving to the base, the lower plates remaining more or less varied with the
middle ones, inscribing once with the base, inscribing a little and the upper nothing
again. The upper turns for their only once, through the rear and well rather
they are not turned on double axes. Newcomer's varvina. The light blue also
have a flat different form. The nemert, moderate, that the one figured on
the front represents indeed a feeding form. (1671). I am not
yet quite certain of this. The nectral has here, the specimen above mentioned.

2. Newcomer's nemert, say. It is apparently not large and much divided, at least in 
part, into a flat middle, nearly navicular, with a long narrow, lanceolate distal bar, 
constricted towards the broad, separated each by a deep, nearly opposite, univalve, 
from the former, lanceolate form, in the latter, univalve form, is elongated, round 
side, oval, broad, distal, from these species becoming compressed and extended 
the top, forming a compound lanceolate, slightly round-topped, point terminal ciliate. 

3. Newcomer's nemert, say. It is apparently very large and much divided, at least in 
part, into a flat middle, nearly navicular, with a long narrow, lanceolate distal bar, 
constricted towards the broad, separated each by a deep, nearly opposite, univalve, 
form, in the former, lanceolate form, in the latter, univalve form, is elongated, round 
side, oval, broad, distal, from these species becoming compressed and extended 
the top, forming a compound lanceolate, slightly round-topped, point terminal ciliate. 

4. Newcomer's nemert, say. It is apparently very large and much divided, at least in 
part, into a flat middle, nearly navicular, with a long narrow, lanceolate distal bar, 
constricted towards the broad, separated each by a deep, nearly opposite, univalve, 
form, in the former, lanceolate form, in the latter, univalve form, is elongated, round 
side, oval, broad, distal, from these species becoming compressed and extended 
the top, forming a compound lanceolate, slightly round-topped, point terminal ciliate.
think, demonstrates that all the leaflets represented in our plate viii, fig. 1 to 6, belong to the same species. The cyclopteroidal leaflets of this species vary in size from little more than half an inch to four or five inches in diameter.

**Neuropteris inflata, Lesq.**

*Geol. Rep. of Ill., vol. ii, p. 431, Pl. xxxvii, fig. 2.*

Though a few specimens of this species have been found in the concretions of Mazon creek since its description was made, these specimens do not indicate in the nature and characters of this plant anything more than was formerly known. All these specimens have only two basilar round inflated leaflets, of a thick coriaceous substance, without any traces of lateral branches. One of the specimens has the leaflet of one side lacerated, or cut in lanceolate linear laciniae, much like the leaves published in the *Geol. Report of Penna.*, p. 856, Pl. v, fig. 5, as *Cyclopteris Germari*, Gopp? As the specimen which I considered then (1854, *Bost. Soc. of N. H.*) as referable to Goppert’s species, is not in my possession, I cannot, by comparison, ascertain if it is or is not identical with ours. Moreover, as both the European and the American species are founded on mere fragments of specimens, we must consider the species which they represent as still uncertain or doubtful.

**Neuropteris coriacea, Sp. nov.**

*Pl. viii, fig. 7 and 8.*

We have of this species only a small branch in a concretion from Mazon creek. It is part of a secondary pinna, lanceolate in outline, bearing nearly opposite oblong lanceolate obtusely pointed pinnules, turned upwards at an acute angle to the rachis, and gradually diminishing in size to the terminal leaflet, which appears proportionally broad. As it is broken from the middle upwards, its form is unknown. The texture of the leaflets is thick, and the smooth epidermis is inflated along the veins and veinlets in an irregular manner, as seen in fig. 8, enlarged.

This inflation may be caused by groups of spores or elongated sori, placed along the veins which are twice forked, and along their divisions. A swelling
of this kind on the veinlets of Neuropteris cordata, Bríg., and which is also often remarked on specimens of our N. hirsuta, has been considered by European authors as representing organs of fructification. As the form and thickness of the inflation is very irregular, it may be caused on both species by some casual influence in the process of mineralization. The basilar leaflets of this species show a tendency to be divided into lobes and pinnules, having thus the same form as some of those of Neuropteris Desorii, Lesq., to which this species is related, and from which it differs only by the thick epidermis, and by the more distant ramification of the veinlets. The small fragment mentioned in vol. ii of this Report, p. 430, as possibly belonging to N. Desorii, Lesq., is referable to this species.

Genus Dictyopteris, Guttubier.

Aldr. u Verst., p. 62.

Frond at least tripinnate, pinnæ linear-lanceolate, bearing alternate leaflets much variable in size, ovate-oblong obtuse squarely cut at the base, with equal lobes on both sides, or with the lower lobes slightly elongated. Medial nerve none, or merely basilar; veinlets anastomosing from the base, arched towards the borders, but irregularly undulating in ascending, and forming by their contact an oval-polygonal reticulation.

Dictyopteris rubella, Sp. nov.

Pl. viii, fig. 2 to 6.

Frond bi or tripinnate; pinnæ linear-lanceolate, with alternate oblong or oval-lanceolate leaflets, attached to the rachis by a broad pedicel. The inferior basilar lobes, as is generally the case in the species of the genus Neuropteris, are slightly longer or protracted into a little obtuse auricle. The terminal leaflet, somewhat broader and longer, is oval in outline, obtuse, and cut on one side into a short obtuse lobe, fig. 2. The leaflets of the large inferior pinnæ are more distant, larger, truncate at the base, slightly scythe-shaped outwards; and
1. Neuropteris foliata Hook. fil. & G. or. var. p. 30. 12. 1836. 4. The description was given of this species at first. It was described by Prof. Hook. fil. and was first published in the "Trans. Linn. Soc." vol. 30. 12. 1836. 5. Description of the new species. The new species is the same as Hook. fil. & G. or. var. p. 30. 12. 1836.

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3. Neuropteris foliata Hook. fil. & G. or. var. p. 30. 12. 1836. 4. The description was given of this species at first. It was described by Prof. Hook. fil. and was first published in the "Trans. Linn. Soc." vol. 30. 12. 1836. 5. Description of the new species. The new species is the same as Hook. fil. & G. or. var. p. 30. 12. 1836.

4. Neuropteris foliata Hook. fil. & G. or. var. p. 30. 12. 1836. 4. The description was given of this species at first. It was described by Prof. Hook. fil. and was first published in the "Trans. Linn. Soc." vol. 30. 12. 1836. 5. Description of the new species. The new species is the same as Hook. fil. & G. or. var. p. 30. 12. 1836.
Neuroptera. Among the Neuroptera, the most important and interesting are the Mantidflies. Mantidflies are known for their predaceous habits and the unique way they capture their prey. The mantidfly has a slender body with large, powerful front legs adapted for grasping and holding prey. Its diet consists mainly of insects, and it plays a crucial role in controlling pest populations in agricultural settings.

Chironomidae are another significant group within the order of Neuroptera. These small flies are often found in freshwater environments and have a branched, segmented abdomen. Chironomidae are important as they are a significant food source for many aquatic animals, including fish and birds. They also play a role in nutrient cycling in aquatic ecosystems.

In conclusion, Neuroptera are a diverse and important group of insects that contribute significantly to the balance of ecosystems. Their unique adaptations and behaviors make them valuable study subjects in entomology and ecology.
Odonotepterus stimulatus. Sp. nov. No. 12. A new lanceolate thorax, narrow, convex, linear oblique, short, the base about one third longer, gradually, symmetrically, deeply lobed, gradually shortening upward and pointed into simple terminal pointable. Ventral, short obtusely rounded, nearly quadrangular in outline, evidently at one time, the undulation slightly curved at the base, forming one or two, fine, slender, linear flaps covered by the expanded, closed, and more numerous than in O. Chilothemis 5, which this species resembles. It differs from the female secondary points and the male only by being fuller in the formula. If an also some slender to O. stimulatus, but the form is confined to O. stimulatus, but the form is not all seen in O. stimulatus. The substance of this species is also the same. The species is presented to O. Berland. This species, as I have seen in a few, is much larger in the American species and O. stimulatus. It may be all as seen in O. Chilothemis, more with the end of the ramis, turning up, and slightly above the border of the leaflets. All the characters of form and variation are the same.

The family of Odonotepterus I may decide what I have seen. (ed.) Odonotepterus stimulatus, I. A number of Odonotepterus I have seen at this time, and in my catalogue of 56 I refer to this species. They are seen fragmentary in the S.C. and from the same region, and although the species have about the same form, they are present fragmentary in some regions. The species, as I have seen in the American species and O. stimulatus, it may be all as seen in O. Chilothemis, more with the end of the ramis, turning up, and slightly above the border of the leaflets. All the characters of form and variation are the same.

The family of Odonotepterus I may decide what I have seen. (ed.) Odonotepterus stimulatus, I. A number of Odonotepterus I have seen at this time, and in my catalogue of 56 I refer to this species. They are seen fragmentary in the S.C. and from the same region, and although the species have about the same form, they are present fragmentary in some regions. The species, as I have seen in the American species and O. stimulatus, it may be all as seen in O. Chilothemis, more with the end of the ramis, turning up, and slightly above the border of the leaflets. All the characters of form and variation are the same.
the axillary pinnules, still larger and cyclopteroidal in form, are attached around the stem by a half circular notch, nearly surrounded by two broad auricles. The veins, anastomosing from the base without medial nerve and in their undulations forming oval-polygonal elongated meshes, curve towards the borders, where the last divisions end in arched close lines.

In this species, found in soft shales at Murphysborough, the epidermis or substance of the leaflets has become, by maceration, separable from the stone, and is easily obtained in lamelle. Whole pinnules can be got in that way without any earthy substance adhering to them; and in that semi-opaque state their texture and nervation are easily studied with the glass. The veins present, under the microscope, the appearance marked in fig. 2.

When the 2d vol. of this Report was published, no species of this genus had been found in Illinois. Now this new one, obtained in numerous and well preserved specimens, not only adds a beautiful species to the flora of the Coal Measures, but furnishes us new evidence on some questions concerning the vegetation of plants of this kind. First, our specimens prove, beyond doubt, the close relation of this genus with the former. The form of the fronds, of the pinnae, of the leaflets, and their variety in size and shape, are exactly alike in both genera. Truly but for its nervation, we should have in our new Dictyopteris a Neuropteris scarcely distinguishable from Neuropteris Loschii, or Neuropteris tenuifolia. But further, the peculiar nervation, as well as the peculiar reddish color of the plant in its fossil state, permit us to identify the large leaflets of the species of this genus with the small ones, or afford the proof that for Dictyopteris as for Neuropteris, the large round cyclopteroidal pinnules, always found isolated, really belong to species represented by pinnae bearing small leaflets of a widely different form. It would not certainly be possible to admit specific identity between the leaves represented, pl. vii, fig. 2, and those of fig. 5, without those peculiarities of structure remarked in both.

The species of Dictyopteris are rare in the Coal Measures. In the United States none had as yet been found but D. obliqua, Bunb., whose remains are very abundant at some places in Pennsylvania and Ohio, and which have also been found, but rarely, in Kentucky and Arkansas. By the form of its leaflets, its ramification f e. f, this last species is related to Dictyopteris Brongniart, Gutb., the only species of this genus known in the Coal Measures of Europe. For D. neuropteroides, Gutb., described from a few small leaflets, is, according to Prof. Ellinghausen, a true Neuropteris, and Dictyopteris cordata, Roem., according to the remarks of the author himself, is a variety of Neuropteris cordata, Brgrt., as his D. Hoffmanni seems to be a variety of D. Brongniart, Gutb.
Genus *ODONTOPTERIS*, Brgt.


**ODONTOPTERIS SUBCUNEATA**, Bubn.

Pl. viii, fig. 10 and 10b.

From the specimen figured here from Mazon creek, it is clear that the fern published under this name in the Ill. Geol. Report, vol. ii, p. 433, pl. xxxvi, fig. 3, does not belong to this species. It is referable to *Odontopteris heterophylla*, Lesq., loc. cit., p. 433, pl. xxxviii, fig. 2 to 5. The pinnules of *Odontopteris subcuneata*, Bubn., are opposite, proportionally longer and narrower, slightly narrowed in the middle, and enlarged to the very obtuse point. The veins are closer to each other; and as the English author has figured them, they curve downward before coming into the border of the rachis, and descend in fascicles along the somewhat decurrent base of the leaflets. In their lower part and just above the decurrent border, these leaflets are all strongly bowed. The terminal pinnule is broken above the middle; it is proportionally large, and appears to be oval-obtuse, entire or without any lateral lobe. I owe this specimen, the most perfect known of this peculiar species, to the kindness of Mr. Michael Prendel, of Morris, Ill.

**ODONTOPTERIS BRADLEYI**, Sp. nov.

Pl. viii, fig. 14.

Nothing is known of this species but the leaflet, which has been copied in our figure. It is lanceolate pointed, somewhat contracted at its base in a broad pedicel. The veins are closely approached, sharply and deeply marked, dichotomous in ascending, nearly straight from the base, where they become parallel. The veins and veinlets of this species are too close to each other and too numerous to admit it as related to *O. heterophylla*, Lesq., which has its leaflets sometimes pointed. It may be compared only to *Odontopteris acuminata*, Ll. and Hutt, of the Oolite.

In concretions from Mazon creek.
Volunteer or guinea pig. From Fig. 180 to 200.

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Volunteer or guinea pig. From Fig. 180 to 200.

Volunteer or guinea pig. From Fig. 180 to 200.
The precursors are very small and nearly represent part of a clouded vine. Whole surface is covered with very fine, white, downy hair. In the interior of the stem, according to the formula, the young vine remains turned out of the way, sometimes twice and even three, as in the stem, or the primary roots, the spiral form being placed upon the vessel or at least the well of each root. The substance of the leaves is not as thick as in the other species. Though it appears much the least size the specimen is not good enough, for a satisfactory determination. If much increase the object.

3. *Asteraceae* (Selected). By W. T. A. R. 1869. According to the species of *Asteraceae*, it seems that the flower is much obtainable and of the same size. The specimen is the only one of the *Asteraceae*, that can be seen obtained in the species and comparing with it, the description of all specimens of the, being different in the terminal leaf, distinctly undulated on the borders. Some of the specimens have narrow leaves, the terminal leaf of the stem, which is not of the breadth. The most likely of the specimen was described above 1869, and might be the species except that the specimen appears distant and very obtuse on the thicker.

It should be compared with the better known *Asteraceae* 1871 (1875) the same. The *Asteraceae* is not without a name. A name comes down a little more than one, and the *Asteraceae* is not without a name. The whole are more obtuse, pointed, or even, sharp, having such long, 2-3 of a short and more obtuse a triangular apex. The flowers are larger and more conspicuous, and are also very conspicuous. The flowers are larger and more conspicuous.

4. *Asteraceae* (Selected). By W. T. A. R. 1869. According to the species of the *Asteraceae* it seems that the flower is much obtainable and of the same size. The specimen is the only one of the *Asteraceae*, that can be seen obtained in the species and comparing with it, the description of all specimens of the, being different in the terminal leaf, distinctly undulated on the borders. Some of the specimens have narrow leaves, the terminal leaf of the stem, which is not of the breadth. The most likely of the specimen was described above 1869, and might be the species except that the specimen appears distant and very obtuse on the thicker.

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6. *Asteraceae* (Selected). By W. T. A. R. 1869. According to the species of the *Asteraceae* it seems that the flower is much obtainable and of the same size. The specimen is the only one of the *Asteraceae*, that can be seen obtained in the species and comparing with it, the description of all specimens of the, being different in the terminal leaf, distinctly undulated on the borders. Some of the specimens have narrow leaves, the terminal leaf of the stem, which is not of the breadth. The most likely of the specimen was described above 1869, and might be the species except that the specimen appears distant and very obtuse on the thicker.

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7. *Asteraceae* (Selected). By W. T. A. R. 1869. According to the species of the *Asteraceae* it seems that the flower is much obtainable and of the same size. The specimen is the only one of the *Asteraceae*, that can be seen obtained in the species and comparing with it, the description of all specimens of the, being different in the terminal leaf, distinctly undulated on the borders. Some of the specimens have narrow leaves, the terminal leaf of the stem, which is not of the breadth. The most likely of the specimen was described above 1869, and might be the species except that the specimen appears distant and very obtuse on the thicker.

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8. *Asteraceae* (Selected). By W. T. A. R. 1869. According to the species of the *Asteraceae* it seems that the flower is much obtainable and of the same size. The specimen is the only one of the *Asteraceae*, that can be seen obtained in the species and comparing with it, the description of all specimens of the, being different in the terminal leaf, distinctly undulated on the borders. Some of the specimens have narrow leaves, the terminal leaf of the stem, which is not of the breadth. The most likely of the specimen was described above 1869, and might be the species except that the specimen appears distant and very obtuse on the thicker.

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9. *Asteraceae* (Selected). By W. T. A. R. 1869. According to the species of the *Asteraceae* it seems that the flower is much obtainable and of the same size. The specimen is the only one of the *Asteraceae*, that can be seen obtained in the species and comparing with it, the description of all specimens of the, being different in the terminal leaf, distinctly undulated on the borders. Some of the specimens have narrow leaves, the terminal leaf of the stem, which is not of the breadth. The most likely of the specimen was described above 1869, and might be the species except that the specimen appears distant and very obtuse on the thicker.
Odontopteris Schlotheimii, Brgt.

Rarely found in the concretions of Mazon creek, but abundant in the roof shales of the coal at Morris. The frond of this fern is very large, at least tri-pinnately divided; the alternate secondary pinnae linear lanceolate, two inches long or more, and more or less deeply and regularly cut in alternate round, oblong lobes, or in oval-lanceolate obtusely pointed pinnules, varying from one-fourth to half an inch long. The veins and veinlets, with the disposition and divisions as marked in Brongniart's description, are thick, parallel, and generally forking once. In the large leaflets there is a medial depression looking like a medial nerve, the veins generally branching from a medial point. Though somewhat obscure, the specimens or this species at Morris are easily identified by the reddish-brown color of the epidermis.

Genus ALETHOPTERIS, Sternb.

This genus is admitted, for the disposition of the fronds and for their division, as it is characterized by Goppert in his Systema, p. 175, and for the position and the form of the fructifications, as modified by Geinitz, in his Verstein, p. 27. It therefore contains not only species whose fructifications are marginal and continuous, but species also bearing in some division of their veins, or between them, round or starlike groups of sporanges like those of the genus Asterocarpus, Gopp. As the fructification of some of our species is unknown, or is not clearly seen through the substance of the leaves, some are admitted into this genus from mere analogy in the divisions and in the form of their fronds, and in their nervation.

Alethopteris Mazoniana, Sp. nov.

Frond evidently large, many times pinnately divided, dichotomous at the end of the divisions; pinnae long linear, tapering slightly toward the points, either pinnately or bi-pinnately lobed; lobes oblong entire obtuse, joined near the base and per-
dendicular to the rachis, or longer broader linear obtuse regularly undulate, lobed on the borders, and more or less distinct and distant to the base. Medial nerve thin, but deeply marked; veins of the simple pinnules rather curved upwards, forking once only at the middle; in the undulated lobed leaflets, one of the veins ascends to the sinus, and is twice forked upwards.

The divisions of the frond of this species appear to have been opposite to each other, and distant, at least in the upper part of the frond, as it is seen fig. 7, representing a specimen which at first seems to belong to another species. As the nervation, the broad deeply grooved rachis, and the form of the pinnules are the same, it is evident that it merely represents the upper part of a frond or of a pinnula, whose ramification is either in the whole, as in the Gleichenia of our time, truly dichotomous, or pinnate and dichotomous, as in some of our species of Pteris. The fructifications of this species as represented pl. xiii, fig. 5 and 6, would rather refer it to the genus Gleichenia or even Polypondium, than to Pteris. They appear like round, oval, enlarged sori, placed along the borders on both sides of the leaflets, between the branches of the veins, as seen fig. 6 enlarged. The outline only of the fructifications is observable through the substance of the leaflets in the form of an oval ring, depressed in the middle, indicating perhaps the point of attachment of an indusium.

This fine species has as yet been found only in the concretions of Mazon creek, where it is tolerably abundant.

**Alethopteris crenulata, Br.**

Though the nervation of this fragment is scarcely well enough preserved to permit the ascertaining of its disposition, it is evident, from the form of the pinnula and of the leaflets, that it represents a fruiting branch of this species. The leaflets united at the base, regularly crenulate around, with the borders apparently reflexed, are marked near the margin by two rows of scars of round sori, each placed in a curve of the crenulation, as seen fig. 15 enlarged. The medial nerve, like the veins, are obsolete, and the details of the nervation could be somewhat distinctly observed only on one of the leaflets. In comparing our figures with that of the sterile parts, published vol. ii of this Report, pl. 39, fig. 3, the essential characters are seen to be the same. This spe-
1. Hothophilus Nasoni, new spec. This is a very small and delicate species, closely resembling the species of the genus Hothophilus, but differing from it in the following respects: The body is more slender, the legs are longer, and the abdomen is more depressed. The species is known from three specimens, which were collected in the vicinity of the Mississippi River. The type specimen is deposited in the American Museum of Natural History.

2. Hothophilus tarsalis, new spec. This species is closely related to Hothophilus Nasoni, but can be distinguished by the following characters: The body is more robust, the legs are shorter, and the abdomen is less depressed. The species is known from three specimens, which were collected in the vicinity of the Mississippi River. The type specimen is deposited in the American Museum of Natural History.

3. Hothophilus mexicanus, new spec. This species is closely related to Hothophilus Nasoni and Hothophilus tarsalis, but can be distinguished by the following characters: The body is more elongated, the legs are longer, and the abdomen is more depressed. The species is known from three specimens, which were collected in the vicinity of the Mississippi River. The type specimen is deposited in the American Museum of Natural History.

4. Hothophilus punctatus, new spec. This species is closely related to Hothophilus Nasoni, but can be distinguished by the following characters: The body is more robust, the legs are shorter, and the abdomen is less depressed. The species is known from three specimens, which were collected in the vicinity of the Mississippi River. The type specimen is deposited in the American Museum of Natural History.

5. Hothophilus pulchellus, new spec. This species is closely related to Hothophilus Nasoni, but can be distinguished by the following characters: The body is more elongated, the legs are longer, and the abdomen is more depressed. The species is known from three specimens, which were collected in the vicinity of the Mississippi River. The type specimen is deposited in the American Museum of Natural History.
characters are not very clear with the scarce. There are however, a page of
the original manuscript, evidently of the same hand, and the lower part, containing a
long list of names and dates, is not very legible. The text is
Then, in connection with this discussion, I have been
asked if I know whether H. A. H. Moore, or any other
author, has published any work on this subject. I am
unaware of any such work.

Q. 1. Has Professor S. M. P. Moore, of the University of
Missouri, any work on this subject? A. Yes. His work is
entitled "The Natural History of the White-tailed Deer," and
is now in press. It is a valuable addition to the literature of the
subject.

Q. 2. If so, has he published any work on this subject?
A. Yes, he has published several papers on the subject, including
"The Life History of the White-tailed Deer," which was published
in the American Naturalist, and "The Ecology of the White-tailed
Deer," which was published in the Journal of Ecology.

Q. 3. Has he published any work on the subject of
the white-tailed deer? A. Yes, he has published several papers
on the subject, including "The Life History of the White-tailed
Deer," which was published in the American Naturalist, and "The
Ecology of the White-tailed Deer," which was published in the

Q. 4. Has he published any work on the subject of
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on the subject, including "The Life History of the White-tailed
Deer," which was published in the American Naturalist, and "The
Ecology of the White-tailed Deer," which was published in the

Q. 5. Has he published any work on the subject of
the white-tailed deer? A. Yes, he has published several papers
on the subject, including "The Life History of the White-tailed
Deer," which was published in the American Naturalist, and "The
Ecology of the White-tailed Deer," which was published in the
Helleborus Helena. In-4. 1843. Discovered in good and numerous
growths from Helena. Thence a number of fragmentary specimens
to from the same coal measure by Mr. Worthen of N. H. S. The all referred
separate ultimately form a very much the same of Helleborus, parti-
To differ however by the specimen, narrowed upward toward the base, more
distant divisions along the rachis by a narrow border, then cast lanceolate,
rounded or obovate pointed, and by the narrower which is at a slightly
more acute angle of divergence, and the rachis nearly all portion, one and
sometimes two, the terminal segment is lance lanceolate, recurved
to an acute or acute. This is evidently a good species. But as the
special, the size, my thought, may be represented to sightly the same
species of fig. 1. and of fig. 2. descendus, more toward the model of the former
underneath the Egg No. 1, at least a few specimens.

1. Among the specimens from Helena coal mine, office at two & 1/2, which I
remembered of Helleborus, intermediate and much different, the more to
being close and more obtuse. The first distant leaflets, such as in Fig. 146
figs. As the other, the leaflet enlarged and united above the long axis, to
of the same plot. The specimen are too imperfect for sufficient comparisa-on
and close the new-plant now no more are as certainly seen up to
the middle near the rachis above the A. Helena. I believe
that they truly belong to a new Helleborus, Helena for I have
from Alabama. Right with a number of bottle small specimens where
the character of close, rachis, and close leaflet, etc. are slender with
then of the same section or I have decided and figure them. The decy
this would deserve remark on their fierce of which I should present
more. Compare specimens. They are generally, Helleborus, obtuse, of with this
Helleborus part. As shown in the figure by the diagram made to indicate
this clause, being the key, the third, instead of the leaflet, the secondary
then or the third single in one pointed, in the middle zone very plan-
t to the middle. The only difference is in the size of the leaflet, whether

p. 4. 3. Helleborus 1841. Helleborus Helena (var. d1561) have linear, slightly
narrower, toward the base, and also broadened at the point (blade). Female division
at an angle of divergence, separated to near the base, where they are slightly
divided and joined at broad obtuse acute, rather acute, more
or less of leaf-shaped, a rounded in size, further divided, the center more
obtuse at the point and more open, middle more than half rounded, according
as the figure. oblong, inserted in a divided to the middle of very ob-
tined and thick, almost, for the upper one, starting at the base and half
branching, further one again near the middle, the middle one, starting near
three, one of the branches. Further, again, the upper one, only reaching
one. This genus is much like the O. of Texas. But it is different
branches are the same, from the branches, which is the稳健, a few
different branches of the rachis from the leaflets. The leaflet does not
so well of the corolla subtorus. The corolla is also well developed, and the
in the genus. I say, nervus, bifasciatus, rectus, and alternated
three approximate, with rotate. This species figure to be a new
variety. - Quoted by H. Whitwell - This species is new in the U.S.
1. The present specimen is from a snail
2. named *P. spiculifer*, one of the few species recognized as having a shell.
3. This species is known for its spicules, which are characteristic of the family. In this specimen, the spicules are arranged in a pattern resembling a spiral coil, which is typical for species in this genus. The spiral pattern is formed by the growth of the spicules around a central axis, giving the shell its distinctive appearance. This spiral arrangement is not only aesthetically pleasing but also provides structural integrity to the shell. The study of these spicules can provide insights into the evolutionary history and ecological adaptations of this species.
FOSSIL PLANTS.

Species is generally rare, and its mode of fructification has not been observed before.

It occurs in the concretions of Mazon creek.

**Alethopteris hymenophylloides, Sp. nov.**

Pl. x, fig. 1 to 4.

Frond large, tripinnately divided, with primary and secondary pinnae alternate, turned upwards, ovate-lanceolate in outline, decurrent in a narrow-winged rachis; secondary pinnae or pinnules either entire, short oblong, obtusely pointed, joined at the middle in acute sinuses; or longer, divided nearly to the base, ovate-lanceolate and pinnately cut into regular obtuse lobes with obtuse sinuses. In the short divisions, the medial nerve only is distinguishable; in the larger ones, the veins, though obscure, appear pinnately branching from the medial nerve in an acute angle and forking at the middle. But for this kind of nervation, this species should be considered as a Hymenophyllites.

Mazon creek; in concretions of clay iron ore.

**Alethopteris inflata, Sp. nov.**

Pl. x, fig. 5 and 6.

Nothing has been found of this species but the fragment figured here. It shows part of a linear pinna, gradually tapering to the point, divided into broadly ovate, or ovate obtusely pointed lobes, enlarged and united near the base, marked in the middle by a short thick nerve pinnately divided by five or six pairs of arched veins forking once. The fructifications are marked by oval inflated large fruit-dots, placed at the base of the leaflets, one only on each side of the enlarged medial nerve. The surface covering these inflated fruit-dots is wrinkled above, and around them, as seen in fig. 6 enlarged.
In considering the form of its fructifications, this species should be separated as the type of a peculiar genus.

Mazon creek; in concretions of clay iron ore.

**Alethopteris Hallii, Sp. nov.**

Pl. x, fig. 7 and 8.

Frond bi-pinnate; pinnae perpendicular to the straight round main rachis, linear, alternate, narrow, close to each other, apparently short, merely cut on the borders by obtuse narrow lobes, either emarginate or square at the top, separated by short obtuse sinuses. Veins and veinlets deep and narrow, the primary ones ascending to the middle of the sinuses andforking twice upwards as seen in fig. 8, enlarged.

This species is closely related to *Alethopteris serrula*, Lesq., Penna. Geol. Report, p. 865, pl. xii, fig. 1, differing from it by its shorter, broader pinnae, placed close to each other; by its more obtuse lobes, and by the primary divisions of the veins, ascending to the middle of the sinuses, and not to the point of the lobes. Though in both species the borders of the pinnules are apparently reflexed, these differences are too marked to be considered mere varieties of the same species. Nevertheless, it might be possible that the specimens from Illinois represent a sterile frond, and those of Pennsylvania fruiting branches of the same species.

Mazon creek; in concretions found by Mr. M. S. Hall.

**Alethopteris erosa, Gein.**

Verst., p. 29, Pl. 32, fig. 7-9.

**Pecopteris erosa, Gutb. (1843.)**

Numerous and large specimens referable to this species have been found by Mr. S. S. Strong, in the roof shales of the coal at Morris.

The American plant merely differs from that of Europe by the longer divisions of the three-pointed lobes, and by the much longer pinnae. The same fronds, or parts of fronds, bear sterile and fruiting pinnae; those especially in
Allothorpea Halliana. The museum has a very fine specimen (H. 158) of this species in its collection. The whole figure only, painted on wood, is 15 inches long and 9 inches broad, and the specimen is too small for examination. December 21, 1802.

3. Allothorpea Hymenoptera, large. In the cabinet at Ithaca, Schenectady, (1811) a very fine specimen. This species, if it represents a genuine hymenopterous insect, is much wider than the one figured, and the peduncle is about 11 inches long. The dissections are quite distinct and well figured.

4. Allothorpea Hyssophylla, large. In the cabinet at Ithaca, Schenectady, (1811) a very fine specimen. This species, if it represents a genuine hymenopterous insect, is much wider than the one figured, and the peduncle is about 11 inches long. The dissections are quite distinct and well figured.

5. Allothorpea Oculata, large. In the cabinet at Ithaca, Schenectady, (1811) a very fine specimen. This species, if it represents a genuine hymenopterous insect, is much wider than the one figured, and the peduncle is about 11 inches long. The dissections are quite distinct and well figured.

6. Allothorpea Dracena, first figured, p. 125 of Plate II. The dissections are not exactly reproduced in the present work, but the figure is very similar to the actual specimen. The dissections are quite distinct and well figured.
Plagiostoma longicirrus, Prof. van. a long-jawed reptile, measuring 22 inches in length. The head is pointed and the body is slender. The scales on the back are large and the skin is thin.

Albionites constrictus, Prof. van. a long-jawed reptile, measuring 14 inches in length. The head is broad and the body is robust. The scales on the back are small and the skin is thick.

Lithostrotos helena. A large, long-jawed reptile, measuring 30 inches in length. The head is broad and the body is robust. The scales on the back are large and the skin is thick.

A small, long-jawed reptile, measuring 6 inches in length. The head is pointed and the body is slender. The scales on the back are large and the skin is thin.
1. All specimens of squamaria? The species is a large and numera
ous specimen in the collection, from which the large and
long, hair of the first 10 centimetres long, and at least 20 centimetres
wide, with very fine texture. When deprived of the burl, there are almost no
reactions. The texture of the surface of the burl is more or less
approximation of the surface of the burl. The texture of the burl is
always more or less enlarged, but at the base.

(Althaea) Rhamnus fruticosus. (L. var. 2. In Prof. Smith's garden,
which I consider, the leaves are two. In a 3/16 in 1/4, which
should be separated and constitute a different species. In 1/16
is a leaf, on representing a reformed frond at leaf. The frond
is slightly crushed and its surface is smooth, it is
from or not seen. The primary rachis is thick, flattened, eight milli-
meters broad, its middle part six millimeters, convex with two flat
smaller axes, two millimeters broad. The secondary rachis is one and one half
3.5 millimeters broad, at the middle point three convex and
the millimeters thick and broader flat one and one half a ninth two
millimeters broad, the tertiary rachis is two millimeters thick with
the same character of a middle convex cone with flat border (wing)
and enlarges on both sides, up and down is joining the body of the
secondary on. The secondary rachises are broad, nearly in equal length,
and not nearly. 1 to 12 centimeters broad and apparently lance-
ate. The tertiary rachises also at an angle of divergence are linear
especially narrowing to broad. The tip is linear lanceolate
more or less winged, narrowing toward the point, 4 to 8 centimeters
long, bearing large alternate fronds inclined upward, fronds large,
either shorter, two centimeters long with the middle of the fronds, one
centimeter broad, oblong ovate, or the lower one is both sides up and
down the rashes. Locate at the upper can line half, the rashes not
without, but only on the lower side toward the rashes, all growing
the rashes to a broad base, occurred in forms the flat boards of
the tertiary rachis. Other rachis, one long, chocolate shades, two to six
and one half millimeters long, primarily directed in short oblong
lobes turned upward and disconnect form below the middle

To 396°.
the upper part. They are scarcely lobed, and covered by groups of sporanges, apparently confluent, and of undeterminable form. Prof. Geinitz figures and describes them as star-like.

**Alethopteris cristata, Gein.**

*Verst., p. 29, Pl. 32, fig. 6.*

*Pecopteris (Diplagites) cristata*, Guth. *p. 396 c. (3)*

We have only small fragments, which, by the size of the pinnae and by their divisions, are referable to this species. As the nervation is obscure, it cannot be positively seen whether they do not perhaps represent different parts of a frond of the former species. The European specimens, at least so far as they are figured, leave us in the same doubt about the value of the species.

From the shales of the Morris coal.

**Alethopteris muricata, Gopp., Syst.**


Good but small specimens of this species have been obtained in the concretion of Mazon creek. It appears to be rare in the western coal fields.

**Alethopteris Pluckneti, Gein.**

*Verst., p. 30, Pl. xxxiii, fig. 425.*

Nothing proves better than this species the insufficiency of our classification of the fossil plants of the Coal Measures. First, a *Felicites* for Schlotheim, it has been a *Pecopteris* for Brongniart, an *Aspidites* for Goppert, and now an *Alethopteris* for Geinitz. The form of its pinnules, especially those of the lower pinna, seems to force its admission into this genus. Some good specimens have been obtained from the shale of Morris, especially part of a tertiary pinna, bearing large leaflets with a broad base, lanceolate pointed, scythe-shaped in form, with the borders divided by alternate obtuse lobes, whose surface is
generally convex and polished. This form is the same as that published by Geinitz, being in all its parts larger than the common one generally found in the eastern Coal Measures.

**Alethopteris spinulosa, Sp. nov.**

Pl. xi, fig. 1 and 2.

F**rond** broad, bi-pinnate; primary **pinnæ** apparently long linear slightly tapering toward the point, divided into alternate broad, half an inch long, oval leaflets, joined above the base, cut at the obtuse top in sharp spiniform short teeth, separated by obtuse sinuses; main stem round, regularly and narrowly striate; secondary rachis straight and flat; medial nerve thick and enlarging toward its slightly decurrent base, with five pairs of alternate veins slightly curved upwards and forking at the middle.

This fine species has no relation, even distant, with any other published as yet from the Coal Measures. The veins and veinlets are not deep, but very distinct by their black color, as seen in fig. 2, enlarged.

From the roof shales of the main coal at St. John's, Perry Co.

**Alethopteris falcata, Sp. nov.**

Pl. xi, fig. 3 and 4.

The specimen figured represents a part of a simply pinnate frond, or of a **pinna** with simple leaflets attached to a main broad smooth rachis, by their whole unconnected base. These pinnules, about two inches long, are linear-lanceolate obtusely pointed, scythe-shaped and entire. The veinlets perpendicular to the half round medial nerve, are very close to each other, very thin, either simple or forked from the base.

On account of its broad curved rachis, of its long nearly linear leaflets attached to it by their whole base, especially of its obsolete nervation, the vein-
New figures of the Genus Aithes. For examining the descriptions and the
figures of all the authors, Messrs. Aithes, and Figura y.

1. Altheus (G. Aithes), Aithes. The table or form of this species is
represented by Fig. 1. The body is small, nearly oval, and
covered with a thin, soft, downy, white or greyish, pubescent
coat. The head is large, and the body is much smaller than the
head. The feet are short, and the legs are thin, with short
claws. The wings are large, and the tail is short. The body is
black, and the head is yellow. The eyes are large, and the
beak is long and slender. The wings are large, and the tail is
short. The body is black, and the head is yellow. The eyes are
large, and the beak is long and slender. The wings are large,
and the tail is short. The body is black, and the head is yellow.
The eyes are large, and the beak is long and slender. The
wings are large, and the tail is short. The body is black,
and the head is yellow. The eyes are large, and the beak is
long and slender. The wings are large, and the tail is short.

2. Altheus (G. Aithes), Aithes. The form of this species is
represented by Fig. 2. The body is small, nearly oval, and
covered with a thin, soft, downy, white or greyish, pubescent
coat. The head is large, and the body is much smaller than the
head. The feet are short, and the legs are thin, with short
claws. The wings are large, and the tail is short. The body is
black, and the head is yellow. The eyes are large, and the
beak is long and slender. The wings are large, and the tail is
short. The body is black, and the head is yellow. The eyes are
large, and the beak is long and slender. The wings are large,
and the tail is short. The body is black, and the head is yellow.
The eyes are large, and the beak is long and slender. The
wings are large, and the tail is short. The body is black,
and the head is yellow. The eyes are large, and the beak is
long and slender. The wings are large, and the tail is short.

3. Aithes (G. Aithes), Aithes. The form of this species is
represented by Fig. 3. The body is small, nearly oval, and
covered with a thin, soft, downy, white or greyish, pubescent
coat. The head is large, and the body is much smaller than the
head. The feet are short, and the legs are thin, with short
claws. The wings are large, and the tail is short. The body is
black, and the head is yellow. The eyes are large, and the
beak is long and slender. The wings are large, and the tail is
short. The body is black, and the head is yellow. The eyes are
large, and the beak is long and slender. The wings are large,
and the tail is short. The body is black, and the head is yellow.
The eyes are large, and the beak is long and slender. The
wings are large, and the tail is short. The body is black,
and the head is yellow. The eyes are large, and the beak is
long and slender. The wings are large, and the tail is short.
The specimen of the Agarum...
Huntington's disease

Huntington's disease is an inherited neurological disorder that affects the brain's ability to control movement, behavior, and emotions. It is caused by a faulty gene, which is passed from parent to child. People with the gene will develop symptoms of the disease before they turn 40 years old. These symptoms include muscle weakness, rigidity, and slow movement. Huntington's disease is a progressive disorder that ultimately leads to death. There is no cure for Huntington's disease.

The symptoms of Huntington's disease are not present at birth, but they can be identified during the teenage years or early adulthood. The disease usually follows a pattern of inheritance, which means that it is passed from parent to child. It is caused by a faulty gene, which is located on the tip of the 4th chromosome. The faulty gene is called a trinucleotide repeat, and it is associated with the Huntington's disease gene.

The trinucleotide repeat is a sequence of three nucleotides repeated multiple times. Normally, this sequence is repeated 18 times or fewer. However, in people with Huntington's disease, the sequence is repeated more than 36 times. The number of repeats is important because it determines the severity of the disease. People with more than 50 repeats usually develop symptoms of the disease before they turn 40 years old, while people with fewer than 36 repeats usually do not develop symptoms until later in life.

The symptoms of Huntington's disease are caused by the degeneration of neurons in the brain. These neurons are responsible for controlling movement, behavior, and emotions. As the disease progresses, the neurons degenerate, leading to muscle weakness, rigidity, and slow movement. The symptoms of the disease can vary from person to person, and they can include:

- Muscle weakness and rigidity
- Choreic movements (voluntary, irregular, and unpredictable movements)
- stiffness
- slurred speech
- memory problems
- emotional problems
- depression
- anxiety
- sleep problems
- fatigue
- loss of appetite
- weight loss
- mood swings
- irritability
- aggression
- self-harm
- suicide

There is currently no cure for Huntington's disease, but there are treatments that can help to manage the symptoms and improve quality of life. These treatments include:

- Drugs that target symptoms
- Physical therapy
- Occupational therapy
- Speech therapy
- Counseling
- Support groups

The life expectancy of people with Huntington's disease is reduced, and they usually die of complications related to their symptoms. The average age of death is around 50 years old. However, advances in medical treatments and support services can help to improve the quality of life for people with Huntington's disease.
lets being scarcely perceivable to the naked eye, this species rather resembles a Cyées than a fern. With a strong glass, the veinlets are seen as marked on fig. 4, enlarged, and these indicate the true relation of the plant.

The specimen may represent a part of a frond in the process of unfolding its leaves, which appear as being pressed upon each other on the lower side of the rachis, and at the same time, still half uncinate. It may also be the representative of a species in its full development. Some Lomarië of our time resemble it, by the nervation and the form of the leaflets. It has no relation with species known from the Coal Measures.

Mazon creek; in concretions of clay iron ore.

**Alethopteris solid'a, Sp. nov.**

Pl. xi, fig. 3–7.

This species is, like the former, known only by a fragment of a frond or of a pinna. It is pinnately divided into narrow leaflets, attached to a proportionally very broad flat rachis, by the enlarged base of a thick medial nerve. These pinnules, a little longer than one inch, perpendicular to the main rachis or slightly turned upwards, are linear obtusely pointed, disconnected at the enlarged rounded base, and entire. They bear along the borders, at equal distances from each other, round groups of sporanges, apparently divided star-like into five round dots, as marked in fig. 7.

By the position of its sori and of its leaves, our species is a Polypodium. It resembles by these characters the species published by Prof. Brongniart, under the name of *Philopteris polygodioides*, Veg. foss., p. 372, pl. 83, fig. 1, and if the nervation should prove to be the same, the American species would be distinguishable only by the broad rachis, the enlarged base of the medial nerve, and the separation of the leaflets. No trace of secondary veins or veinlets is observable on the specimen, which is in a concretion from Mazon creek. Our species is also related to *Polypodites elegans* and *Polypodites Lindleyi* of Goppert.
Alethopteris Lanceolata, Sp. nov.

Pl. xiii, fig. 1 to 3.

The specimens represent two parts of simple pinnae or of fronds, with alternate linear lanceolate obtusely pointed leaflets, oblique on the rachis, or slightly scythe-shaped, narrowed at the base to half their width, and rounded to the point of attachment to the rachis; entire on the borders and smooth on the surface. Main or medial nerve half round, moderately thick; secondary veins attached to it in a very acute angle, alternately branching from the base in veinlets curved inwardly, as marked fig. 2, the upper ones ascending to the borders of the leaflets, the lower ones becoming confluent in ascending.

Of the two specimens which have been seen of this species, and which are figured here, that of fig. 1 seems to represent the upper part of a frond, while the other, fig. 3, looks like the terminal part of a pinna, and therefore the species is apparently bi or tripinnate. The nervation resembles that of the following species, but the veins and their divisions are more oblique, more slender and of a more delicate texture.

Mazon creek; in concretions.

Alethopteris emarginata, Gopp.

Syst. foss., p. 274, Pl. xvi, fig. 1 and 2.

Pl. xiii, fig. 4.

We have in the concretions of Mazon creek many separate leaflets of the same form and of the same size as the one figured. The borders of these linear obtuse leaflets are slightly and equally undulate-lobed, as formed of pinnules connate to the top; the nervation is nearly similar to that of the former species, the secondary veins being only more open to the medial nerve, or nearly perpendicular to it, while their branches, generally more marked and thicker,
1. Helopteris lanceolata. Stem, card: leaflets entire on the stem, or 3-5
slightly undulate. Some of the leaflets are entire, some withly undulate. The
main veins is half round, in the middle by a narrow groove. This
character is distinctive to separate the species from its congeners. Its
in side shoots usually: fronds in very thin round, central density perceptible
bark. Mas. sp. 414 7.14 - 25/6 21

2. Trichomanes (Helopteris) subrevus. Stem, leaflets primary
lanceolate (two parallel, the upper part longer). Secondary fronds open the lower
one, 6 to 7 and long gradually divide. The upper one, only one and on half
end middle, all alternate; divide, alternate triads of at times, joined to
the middle, turned upward, before, the lower ones in the inferior part
of the froned slightly larger, but entire, of the form free attached half to the
main rachis which is broad flat, three million, in the lower part
slightly flaccid, is inserted near the base, distinctly except in the lower
inferior leaf, a little more distinct than the reives, reason the lower part of the
leaf, three live or three from the main rachis, the other from the middle,
split into one or two parallel, all flaccid, feet turn to the lower
and upward, the lower part the upper one, the base divided
amongst and deciduous, at the base, they flaccidly and not curved
in reaching the frond. The rachis is marked here. The figure of Helopteris
broadly 11/6. It XXXI is correct enough but the rachis
are marked straight by the influence of the epiphrags, when
are distinctly the lateral on an double. For they run in the
base, flowering, a species of Beck, 1893 XIII 5. 6c. Why
I think it has more simple leaf and only one description of Beck,
not the only Helopteris for Trichomanes. Beck fig. shows
the rachis (primary) distinctly flakes a see those specimen
and specimen does, only a manifestation as a central primary one, of the
the 10 to 20 cm or more, in the upper rachis, same base, the lobes together
connected very small, more common at the base, further away and past dividing
the flaccid, lower part at the base, the last paper preserved, being entire
the lower the whole, so that the lower rachis divided, by undulations, to join
the division of a leaf, forms a channel, on the of lobes of Helopteris, external.
Tyrus and for the base, nature and this space, brought past be refered
the Abies to Trichomanes. Unfortunately I have no the comparable
the specimen of named the Helopteris so the description L. Beck, 1893.

Reichstein helotina aglaia. Ma. T. seem referable to this species. The above
purposes, fronds at genus, of which all with short secondary rachis, should
not be, nearly in right angle, or 90°, old give up an embedded apparently mid
venu near vsmall, slightly obscure, along other secondary distinct to
the lower often distant and rounded. Helopteris, the size of the rachis.
Not to the long turn three second middle, there are evidently millions upon
the surface, with a venation in this view, the other in his face is smooth appearing
to errors and the rachis are very thin, recurved and recurved in each angle to the
rachis, generally further one of the lower rachis, the early, slowly, the rachis, setting.
the leaf, being a system, somewhat two quadrilateral indicible, also a
the leaf, resembling rachis, whether the two quadrilateral indicible, also a
the leaf, resembling rachis, whether the two quadrilateral indicible, also a

3. Helopteris lanceolata. Stem, card: leaflets entire on the stem, or 3-5
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inferior leaf, a little more distinct than the reives, reason the lower part of the
leaf, three live or three from the main rachis, the other from the middle,
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and upward, the lower part the upper one, the base divided
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and specimen does, only a manifestation as a central primary one, of the
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the flaccid, lower part at the base, the last paper preserved, being entire
the lower the whole, so that the lower rachis divided, by undulations, to join
the division of a leaf, forms a channel, on the of lobes of Helopteris, external.
Tyrus and for the base, nature and this space, brought past be refered
the Abies to Trichomanes. Unfortunately I have no the comparable
the specimen of named the Helopteris so the description L. Beck, 1893.

Reichstein helotina aglaia. Ma. T. seem referable to this species. The above
purposes, fronds at genus, of which all with short secondary rachis, should
not be, nearly in right angle, or 90°, old give up an embedded apparently mid
venu near vsmall, slightly obscure, along other secondary distinct to
the lower often distant and rounded. Helopteris, the size of the rachis.
b) Segmentation. In the first segment, the head is divided into a lower part, generally somewhat shorter, and a neck, which is longer. The head has a rounded or cylindrical shape, while the neck is more elongated. The second segment is the thorax, which is divided into three parts: the thorax proper, the thoracic segments, and the abdominal segments. The thorax proper is the largest and contains the heart, lungs, and other internal organs. The thoracic segments are smaller and contain the abdominal segments, which are the parts of the body that contain the digestive and reproductive systems. The abdominal segments are usually divided into two parts: the dorsal and ventral parts. The dorsal part is the upper part of the segment, and the ventral part is the lower part. The abdomen is divided into several segments, each containing a pair of appendages. The appendages are used for various functions, such as breathing, digestion, and reproduction.
The American Museum of Natural History has two collections of plant fossils, one from South America and one from North America. The South American collection includes plants from the late Eocene and Oligocene eras, while the North American collection includes plants from the late Cretaceous and early Tertiary periods. The South American collection is housed in the Department of Paleobotany, and the North American collection is housed in the Department of Botany.

In the South American collection, the plants are primarily from the Andean region, where they were preserved in volcanic ash. The North American collection includes plants from the Rocky Mountains, Great Plains, and other regions of the western United States. The North American collection is larger and more diverse than the South American collection.

The plant fossils in both collections are used to study the history of plant evolution and the changing environments of the past. The plant fossils are analyzed using a variety of methods, including paleobotanical techniques, stable isotope analysis, and molecular phylogenetics. The results of these analyses help to understand the biogeography and ecology of the ancient plant communities.

In conclusion, the two plant fossil collections at the American Museum of Natural History provide valuable insights into the history of plant life and the changing environments of the past. The collections are an important resource for researchers in paleobotany and ecology, and they continue to be studied and analyzed for new information.
Georgius Miller. — By a small specimen from Daudigap, 14. 1581, were taken some of this species, with narrow head and short very often separate to the radicles, are not far distant, as broad as a large small shell, of this, that is the meso- indicates that the mode are large but also very flat and comparatively thin. The preservation is of the same character. But in the specimen. Not far from the G. 1482.

Georgius Tillmann. — Linn. Specimen No. 167 to 170, represented a single form of this species with smooth pinnulae and a small prismatic form. The two are in a group of 4 to 5 (performed by A. F. T. 5) and the constant, placed on each side of the radicle in G. and the large shell, as the most near. No. 170, No. 170 at close, show four, or possibly five, large side, the radicle. The specimen designated, No. 170, which are exact.

H. Laetsch. — Bost. There is no specimen near men from Carolina, the radicles, indicating. No. 135 represents a young prisma, with a broad flat radicle with smooth pinnulae, the shell has been placed in the right angle of the two small prismatic form, in a group of 4 to 5, and the constant, placed on each side of the radicle. The specimen designated, No. 170, which are exact.

Georgius Tillmann. — By a small specimen from Daudigap, 14. 1581, were taken some of this species, with narrow head and short very often separate to the radicles, are not far distant, as broad as a large small shell, of this, that is the meso- indicates that the mode are large but also very flat and comparatively thin. The preservation is of the same character. But in the specimen. Not far from the G. 1482.
FOSSIL PLANTS.

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ascend to the border of the leaflets. This kind of nervation is that of Goppert's species. But in our American specimens, the leaflets are broader, shorter, and by the increasing depth of the divisions of the borders, they become by degrees cut into lobes nearly to the base, and then are undistinguishable from Pecopteris septa, Brgt., except, perhaps, by the medial nerve or secondary rachis, half round and not quite as thick, and by a thinner texture of the leaves. The fructification is marginal, in round distinct sori which sometimes become irregularly scattered by compression.

Genus PECOPTERIS, Brgt.

Pecopteris Strongii, Sp. nov.

Pl. xiii, fig. 7-9.

Frond simply pinnate or poly-pinnate, pinnae, linear tapering above to a point, slightly narrowing toward the base. Pinnules alternate, perpendicular to the striated narrow rachis, nearly one inch long and proportionately narrow, linear obtuse, often slightly enlarged at the obtuse point, attached to the rachis by their whole, sometimes enlarged base, disconnected and often distant, the distance between them being sometimes as wide as the breadth of the leaflets, becoming closer to each other towards the point of the pinnae, where they are shorter and connate at base. Fructification, marked by scars of broad round sori, with a concave point in the centre, placed near the borders of the leaflets, close to each other, ten to twelve on each side of the pinnules. Their place in relation to the veins and veinlets is unknown, the substance of the leaflets being thick, coreaceous, and the nervation obsolete.

As it is seen in fig. 7 and 8, enlarged, the borders of the leaflets are slightly undulate, an irregularity apparently caused by the compression of the sori expanding the margin, or passing out of it, for in fig. 9 all the pinnules are entire on the borders. This last specimen seems to represent a small frond rather than a pinna, for the leaflets turn downwards towards its base, as is the case in some simple fronds of species of Polypodium of our time. By its form
and the position of the soris, our species could also be compared to Aspidium Wrightii, Mitt. of Cuba. Its place is, therefore with the Polypodites or Aspidites of Goppert.

The specimen fig. 7, is in a concretion from Mazon creek; the others on shale from Morris.

Found by Mr. S. S. Strong.

-Pecopteris sqamosa, Sp. nov.

Pl. xii, fig. 1 to 4; Pl. xiii, fig. 10 and 11, fructif.

Frond evidently bi or tripinately divided, triangular or lanceolate in outline, with a thick rachis, half an inch or more at its base, covered to the top of its last divisions with long, linear lanceolate pointed scales, either straight and appressed to the stem, or open and diverging all around, even sometimes appearing as dried up and crumpled as in fig. 2. The rachis of the last divisions is proportionally broad as seen in fig. 1 and fig. 4, enlarged, and is also either scaly or marked with crowded points indicating the base of the scales. Secondary pinnae long, linear, slightly tapering to an obtuse point, flexuous or curved upwards, bearing alternate, unequal, narrow linear, obtuse, oblong leaflets, nearly perpendicular to the rachis, reflexed on the borders, very close to each other, or often contiguous for their whole length, marked with a deep medial nerve, but no trace of veins. These leaflets, generally more or less irregular in their length, have their fructification indicated by small round dots, placed in two rows, close to the borders; the dots are numerous and distinct; their relation to the veins and veinlets is unknown.

The species is quite distinct and only distantly related to Pecopteris platy-rachis Brbg. The specimen represented, pl. xii, fig. 4, shows a part of a frond of this species, in its process of development. The divisions appear still unopened and the outline only of the secondary pinnae with mere traits of medial nerves, are indicated by flakes of matter.

This specimen is upon shale from the roof of the coal at Colchester; the other specimens figured are in concretions from Mazon creek.
The specimen in question appears to be a variant of the species described by (1), which, by its general resemblance to the arborescent variety, may be a new species. It represents the top of a plant with a somewhat thick, short, rounded, rather secondary, juvenile, close to the rhizome, narrow, green, lanceolate, gradually tapering to the base, borne of an elongate, obtuse, purplish-red, in the axils of the leaves. The leaves of the lower leaves are thick, united, the uppermost simple, from the rhizome, slender, at the summit, green, thin, the rhizome very slender, and the lower leaves divided from near the base on. The leaves of the upper leaves are mostly oblong, oval, or almost ovate, and narrower, nearly parallel to the midrib.

The margins of the leaves are entire, with a few, scattered, slender, central nerves. The petals are purple, with a green, narrow, central, purple, linear, narrow, 10-15 mm, long, and the ovary is fat, with broad, red, and red, purplish, very slender, and the lower leaves divided from near the base on. The leaf is oval, or almost ovate, and wider, nearly parallel to the midrib.

The leaves of the lower leaves are thick, united, the uppermost simple, from the rhizome, slender, at the summit, green, thin, the rhizome very slender, and the lower leaves divided from near the base on. The leaves of the upper leaves are mostly oblong, oval, or almost ovate, and narrower, nearly parallel to the midrib.

The petals are purple, with a green, narrow, central, purple, linear, narrow, 10-15 mm, long, and the ovary is fat, with broad, red, and red, purplish, very slender, and the lower leaves divided from near the base on. The leaf is oval, or almost ovate, and wider, nearly parallel to the midrib.
2. "Seventy completion. By 1795, with the opening a narrow 1/45 which from the
left of the tent with numerals similar, structure distinct. It may be another species

3. "Seventy sister. But a few minutes simple button in Mansfield which had
the size of a new large with its annual and the secondary primary
short, narrow, nearly right angle. Its faces resembling as the same look.

4. "Seventy, usually oblong. They both become a further twice. It is
irregular. This species, described in the second of the species 1442.2(2).

5. "Seventy of a large order, splendid from new 23 centimeters, broad
with secondary primary oblong, eleven centimeters long with primary, clusted
12 mill long 4 million breed. (Figure 14.

6. "Seventy, usually oblong. Fifty-five 141.1(1) of Brittle is an ultimate
form, narrowly divided, lanceolate, five cent long, primary divided once or
twice upward, sinuate at the base, orb lanceolate, the triangular, the
available ferramentum, with divisions (6) others half round, square by the
middle. Edge ferramentum, gradually becoming entire. The ultimate sizes round
oral, rich, half round middle rim, slightly decurved at base, lateral
rim, say then, those alternately, nothing. The approach is also of the
form of the ferramentum. Look, especially like that of J. (Johnstonti) Murraya.

7. "Seventy, usually oblong. Another species in two parts, on fruiting:
N.26 of Brittle has half primary primary, apparently large
long and linear. Secondary primary, up to broad irregular, hair
rough or punctured rack, eight to ten cent long, those of the fruiting
primary short, linear lanceolate, narrowly divided. Formulas
fine and narrowed at the base in joining the broad rough rack, linear
peach lanceolate, about one cent. Long primary divided, the cut to
the middle or to below the middle, dotted, connate. Middle vein thick,
lateral vein alternately or in the leaflets of N.11. The time a main
in the leaf lower leaf, which has the same character of venation and connatulate
of the leaf in figure, (Fig. 11) Brittle. The field primary which
10 connate as referable to the leaflets, the main rack, half divided, rough
and divided. The primary short, but narrowly divided. The same
as the heredity of the ferramentum, about the same form geology, leaf.

8. "Seventy, usually oblong. Only tree at the height and large or small
and united two or three.
2. Ephrata, Bashland &c. 1f you join G. 18th June, 1810, with all the
characters of this town, and its steady influence, it is by form of legal, prima
præter. 2. But, disregarding places as in the section of the south, back, thence
(slow) under 19, 18, 18, through the back is 18 to 4, is bordered to marks
by which 6, though scattered, and somewhat distinct show that it was
based by these a back. This rank is therefore slightly by 18 and 4, 1810, 2.
18, about 4, 18. Among numerous new men separate little piece, these are
on, G. 20, which strictly regular proportion. The whole under surface of the line, expressed
around with they round, as in apparently universal and certain a half hour. Then these are
open or have left the back, the surface appears covered by minute points on
execution. The back that by close to each other. The peculiar of the group
has not yet been described. But in the reckoning of this distance is more that 18, 4,
that quite evident that this is a line. 

2. They are of a certain kind. The reason, G. 20 which I refer with doubt to the places,
that only separate everyday. They are very (in) proportion, proportionately came, to the main (and)
room, (looking to a point-plain point). It forms a part or more or less in the main place.
and deliberation. But (f) (in) 509. Refer them give to Scipio De Sanctis, power
hand's initial note appears below: record (words) regular angles me evident two
which in one species, the central area is distinct, according to the top of the back, and
the result, it appears above, covering nearly, proportionally to the initial, area proportioned
on the first plan. As the result, me and proportion I will mark on 11. 10. 11.
2. Ephrata, Bashland &c. Here are who especially some as, 1b and appear
identical by any character I refer the group to say: transaction of the main. But the
reputation is in an indicant of property and not necessarily in my space. Wherein is dangerin
the secondary instance as that and not according to the expectation which you with (f) 18. 10. 10.
2. Bashland. A group, G. 20 is also added to this group. It shows still
a slightly irregular ratio, and though in appearance much like T. Logemans &c,
Bashland has the figures on, all the leading entire and the revolution less divided.
Both places are early conformed, 12. 10. 10, 1403, 1.
FOSSIL PLANTS.

**Pecopteris Sillimani**, Brght., Veg. foss., p. 353.

Pl. 96, fig. 5

This is one of the rarest species of our Coal Measures. The few specimens which I consider referable to it, are small and incomplete; one of them is from Mazon creek, in concretions of clay iron ore.


Pl. 99, fig. 2.

The specimen representing this species, distinctly shows the character indicated by the author. The pinnae are straight, nearly horizontal (four inches long with the end broken off), the leaflets oblong, somewhat lanceolate obtuse, but not quite as obtuse as in Brongniart's figure, slightly scythe-shaped outwards, etc. The pinnules are of a thick coriaceous substance, concave, and deeply impressed upon the stone.

Found in a concretion on Little Vermilion river, by Dr. J. C. Winslow.

**Pecopteris Candolliana**, Brght., Veg. foss., p. 305.

Pl. 100, fig. 1.

One good distinct specimen, in a concretion from Mazon creek, while numerous specimens from the same locality have branches, with characters intermediate between this species and *Pecopteris cyathaea* of the same author.

**Pecopteris hemiteloides**, Brght., Veg. foss., p. 314.

Pl. 108, fig. 1.

The specimen from Mazon creek, is half a concretion, representing part of a pinna, bearing oblong, slightly pointed leaflets, disconnected at the base, with borders inflated, and a double row of large sori, unlike any other hitherto seen of this genus. These sori open by a transverse split, agreeing with Brongniart's fig. 2 A in every peculiarity of form. Our specimen does not show any trace of nervation.

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Pecopteris villosa, Brgt., Veg. foss., p. 316.

Pl. 104, fig. 3.

This species is the most abundant of all in the concretions of Mazon creek, which show it in its multifarious forms. The nervation does not appear to have been seen by European paleontologists. Brongniart does not give any details of it, and Geinitz indicates it as simple, or with veinlets forking once only, which is totally at variance with its true nature. The concretions contain numerous parts of the plant preserved in a state of partial maceration, either with pinnae whose substance is destroyed, and which have nothing left but the outlines of their leaflets, and the entirely free veins and veinlets; or pinnae half preserved, one part of which bears leaflets with the villous epidermis, while the other part has the veins and veinlets free of epidermis, and quite distinct. From the form of its pinnule, the multiple divisions of its pinnae, and of its veins, this Pecopteris is exactly similar to \textit{P. polymorpha}, Brgt., the veinlets dividing once or twice or more, according to the place and size of the pinnules.

Pecopteris arguta, Brgt. (fructifera.)

Pl. xiii, fig. 12 and 13.

The part of a pinna, as represented in the figure, bears leaflets, connate at the base, oblong, lanceolate obtuse, somewhat shorter, more pointed, and more distinct than is generally the case in sterile pinnae of this species. But as the nervation, as well as the crenulate-toothed borders of the leaflets, are similar to those of \textit{Pecopteris arguta}, and as these peculiar characters are not known in any other species of the coal, I consider this specimen as representing its fruiting part, which was before unknown. The \textit{sori} appear like inflated dots placed just at the point of the simple veins or rather like conical \textit{sori}, with the point to the inside of the leaflets and the enlarged opening outside at the point of the teeth, as marked, fig. 13, enlarged. Their form is distinct; with a strong glass they even appear filled with a pulverulent matter. According to the form and the position of these fruit-dots, the species resembles an \textit{Aspidium}, and should be placed in the genus \textit{Aspidites}, Gopp. Sterile pinnae of this species are not rare in the shales at Morris.
1. Lecytopsis arguta. Prep. fruits. - A small but very good specimen obtained at Moroni, 8, 19.5. It appears to have been collected by the late Dr. R. Armstrong, who has kindly placed it at my disposal. The fruticose branches are stout, short, and nearly cylindrical, with a few small tubercles at the joints. The leaves are ovate, suborbicular, and somewhat glossy, with a short, pointed apex. They are arranged spirally on the stems, and the foliage is quite dense. The flowers are small, white, and somewhat fragrant, with a short, tubular calyx and a four-lobed corolla. The fruit is a small, hard, oval drupe, greenish in color, and slightly viscid. It is about 0.5 cm in diameter and contains a single seed. The seeds are brown, hard, and oblong, with a smooth, glossy appearance. The plant is found in the drier parts of the savanna, from the lowlands to about 1500 meters above sea level. It is a common sight along the roads and in the gardens of the Moroni district. It is sometimes cultivated for its attractive flowers and fruits.
1. Tetramorus alpinus, Fig. 1, is very variable in size. Among the figures of the museum which belong to this species, some of them seem to be excessively small points. In general, the subspecies of this apparently rare plant is of small stature. It is known to have two leaves, one generally attached to a broad, smooth rachis, 3½ mm. long, the other, 2½ mm. long, and 0.6 mm. broad. The inflorescence is a cymose panicle with small, thready, thin, brown, small flowers, and a few seeds. The flowers, when shed, exude a strong, pungent odour. The leaves are generally small, 3½ mm. long, and 0.6 mm. broad, with a few small brown, thin, hard, apple-like seeds. The inflorescence is a cymose panicle with small, thready, thin, brown, small flowers, and a few seeds. The flowers, when shed, exude a strong, pungent odour. The leaves are generally small, 3½ mm. long, and 0.6 mm. broad, with a few small brown, thin, hard, apple-like seeds. The inflorescence is a cymose panicle with small, thready, thin, brown, small flowers, and a few seeds. The flowers, when shed, exude a strong, pungent odour.
Dated 19th May 1835.

A message of inquiry. The 28th from Coal Park. To represent many pounds of licenses of persons and books which are included in the 26th. No. 27th. Two licenses saw a woman with no on the secondary plan. With a broad right, subject to

isolate, except the primary second. £10 or 3/4 long, communicating to a point with perpendicular. winners combined at 1000. Using other somewhat hand around a turn, which is still broad, remaining to the point, marked in the second to be a high

in line identical according but the second of the secretaries, subject to long, very. Where

the hill we appear would nothing again in much, itself, and in such

without so much. Their, and every, reflected. This long and it helps. The

bottomless, and, however somewhat in columns set. The long and very

point of the secretaries, subject to long, very. Where

in line identical according but the second of the secretaries, subject to long, very. Where
2. Fungus. *Exocheschnora Bruch.*—I have two specimens of this. The first is a good one from the cell which by the botany of the ground and of the prize, and the exact form of the formula, which is described by Dr. H. T. Smith, and I think the best one for the same purpose. The second is a very fine one from the same species, and is considered by Dr. H. T. Smith as the best one for the same purpose. It is a very fine one from the same species, and is considered by Dr. H. T. Smith as the best one for the same purpose.
FOSSIL PLANTS.

PECOPTERIS ELEGANS, Germ.


Pl. xv, fig. 10.

We have in abundance, in the concretions of Mazon creek, specimens which agree in every point with the figures and description of this species. Pinnae, bearing linear leaflets, entire on the borders, round at the top, marked by medial nerves from which branch in an acute angle simple veins, ascending straight to the borders, or sometimes slightly curving upwards. But the characters here indicated are so variable and passing by such inappreciable transitions to those of the true *Pecopteris unita*, Brgt., that after the examination of many hundred specimens, it is impossible to point out a single trait which could be described as distinctive of one of these species. I therefore consider this *Pecopteris elegans*, Germ., as a variety of *Pecopteris unita*, Brgt.

PECOPTERIS ASPIDIOIDES, Brgt., *Veg. foss.*, p. 311.

Pl. 112, fig 2.

Found at Mazon creek; rare; seen only in two specimens.

PECOPTERIS ABBREVIATA, Brgt., *Veg. foss.*, p. 337.

Pl. 115, fig. 1 to 4.

Numerous and very fine specimens in concretions from Mazon creek are referable to this species, rather by the figures given of it by Geinitz in his Versteineringen, than to those of Brongniart. The secondary pinnae are short, all equal, the veins and veinlets much inflated, the pinnules more generally disconnected f. c. f. It is altogether a different species from *Pecopteris Miltoni*, Brgt., to which the German author unites it as a variety, at least, if we consider our American specimens identical, which, however, may represent a new species.
Pecopteris dentata, Brgt.

Veg. foss., p. 336, pi. 124.

A fine species found in large specimens in the shales of the coal at Morris, and also in the concretions of Mazon creek.

Pecopteris flavicans? Presl.

Sphenopteris flavicans? Presl.

Sternb., Vers., vol. ii, p. 127. Pl. xiii, fig. 1, a, b, c.

From Mazon creek also, and in concretions, we have obtained a number of specimens of a species which appears closely related to this species, if it is not identical with it. They represent parts of fronds or pinnae, bipinnately divided; primary divisions alternate, open, straight or slightly flexuous, linear, bearing alternate, oblong, short, obtuse pinnules, connate at their base, slightly decurrent, with a decurrent medial nerve; alternately branching in simple veins, two or three on each side, turning inwards in ascending or straight to the border. The fruit dots are marked in a double row near the borders of the leaflets, apparently placed upon the veins. The main rachis and its divisions are deep and grooved. But for the position of the sori and of the thick epidermis of its leaflets, this species could be referred to Oligocarpia Gutbieri, Gopp., the disposition of the deeply marked veins and the form of the pinnules being alike. As this Pecopteris flavicans is not mentioned by any recent author, not even by Unger, and as it is known only by the short description and the incomplete figures given of it by Sternberg, our species is referred to it with doubt.

Pecopteris chereophylloides, Brgt.

It is remarked, vol. 2, p. 443 of this Report, that this species was still uncertain, having been found only in incomplete specimens. It has been obtained since from the roof shales at Colchester in large and good specimens. Except Pecopteris Cistii, Brgt., P. velutina, Lesqx., P. Newberryi, Lesqx., all the species of Pecopteris enumerated in the 2d vol., have been since found in Illinois.
3. According to the New York Times, 1864, it is apparently true, that two 
apparently different species of the same kind, but intergrading, inhabit 
the same valley. The chief are undisturbed, but the former species, 
endangered by the latter, are at present being lost. The first 
species is characterized by having a long, slender, pointed snout, and the 
second by having a short, stout, and more robust snout. The former 
habitats are riparian zones, while the latter inhabit dry, 
open grasslands and meadows.

4. The climate in this area is continental, with cold winters and 
hot, dry summers. The precipitation is uneven, with most rain 
falling during the summer months. The area is prone to droughts 
and occasional floods, which can have a significant impact on 
local agriculture.

5. The plant species in this area include: *Poaceae* (grass family), 
*Leguminosae* (legume family), and *Rosaceae* (rose family). 
These species are adapted to the local climate and soil conditions.

6. The microphyllous plants of this area are characterized by 
small, narrow leaves, and are found in the upper forests. 
These plants are adapted to the shaded conditions of the upper 
forest understory, and are able to survive in low-light conditions.

7. The *Hymenoptera* fauna in this area includes: *Apidae* (bees), 
*Bombidae* (butterflies), and *Hymenoptera* (ants). These 
insects play a crucial role in pollination and are important 
components of the local ecosystem.
The text is not legible due to the quality of the image.
1. Siphonites ulleps, Gaim. Proc. Zool. Soc. 1844 p. 1650 (1845). Pumella: Mode of crest in referable to this species (or rather perhaps to its variety) by photo; broad, quadrangular, secondary ven, much forked and surface smooth. The species represents only an Eulamia parva with long, narrow, abruptly curved, taeus, smooth, white, millimeter hand decors, and attached by the variable lower part, usually more finely as a fragment by Gaimard and described by M. Brun, 1859. Real.

These Siphonites klintbodei R. M. 1844 a small specimen from Pumella, represents an Eulamia parva with long, broad, slightly decors, leaflet turned upwards and not smooth, long, and rough, as in Pentameres. The only difference is that from the description of the leaflet, or rather to the base, where in this species they are joined a little above the van area. The leaflet, as determined by my description, 1845. 1650, the base, veins, are generally broad and varnished upwards, very thick, and deeply crenated, with different near the base, 1845. 1650.

2. Cylindrical aper Mort. Proc. Zool. Soc. 1847. Pumella from Pumella, which 1845. 1650 agree in size with fig. and description of the species & Mort. The main (ultram) area however in right angle to the main or a pronatal crista and not from a little long and bored. It is, therefore, the same, from simple, not a more grey or dark, and much cooking backwards, 1850. 1650, resembles it in appearance, except the species is a quite different from the Pumella. The venticile of the ultras is broader. The main area of the pupules is a red smooth, the leaflet; a pure violet bright or white and then more oblong, with the leaflet and irregular length.

3. Clavina hirta, Mont. Proc. Zool. Soc. 1847. Pumella from a horn-plank is a small specimen a pupule with reading an up and down angle, thought, different, provided, from each other, 1847. 1650. cent. long, placed in a narrow, nearly equal, the leaflet, in full. And other of the Eulamia parva if found on or out of it, 1847. 1650. 2. 5 a millimeter hand, with reading a Hyper, the single interstices nearly equal and the middle of the upper up. The secondary pupules are thin, thorny, with nearly 3. 10 and finally the pupules thin to the smooth pupules which are linear and gradually diminish in length toward the top of the pupules, the tertiaire pupules are obtuse.

4. Cylindrical Cylindrica Gigantea. This species represented by larva. 1845. 1650 and 1845. 1650, 1. 1. 1 fill one plate. 1845. 1650. It is a large pupule. The specula, pupule, forms, forms, terna, alternately, in narrow, branching, secondary, perna, perna, terna, terna, obtuse, various length and mouth, winding the position to the alternate tube of a fumill, the inferior ones, sometimes perna, tend to be leaflet along the sinister, while in the appearance of the others, oblong, or linear, other found at or near their base or united to the isomela, above the snail of the same, many more in 1845. 1650. the leaflets are irregularly divided, decors, and united at the base of the, and union of small, circular, hand divided, by a narrow, made simple a tributary, in both rows, a closed, one side, and uniting at the other; these in a plate upon the same pupule and terna, multiplied, 1845. 1650, I have not observed the polymorphism in other pupules which ran generally the pinnate knob, clathrata of the Cylindrica var. regular. 1845. 1650.
A sheet of paper is coated by a smooth, gelatine-like surface which entirely obscures the paper's substance, then a sheet. This specimen, carefully prepared, is a specimen showing the under surface of the plant, and a dissected, then under the same process, is distinguished. By the middle of each half, and the half of the specimen, the whole is comparable to a section of a tree. The half of the specimen, the whole of the specimen, the half of the specimen, and the half of the specimen, is not punctuated at all. Moreover, as the specimen is always more or less elongated and more curved to the body of the specimen, the whole of the specimen is not punctuated at all. Moreover, as the specimen is always more or less elongated and more curved to the body of the specimen, the whole of the specimen is not punctuated at all.
FOSSIL PLANTS.

Genus STAPHYLOPTERIS.


Count Sternberg, in his Versuch, loc. cit., defines this genus merely as: inflorescence or fructified panicles of ferns, analogous to those of Botrychium or Anemia.

The only species described by the author as the type of his genus: Staphylopteris polybotrya, from the Tertiary of Europe, represents a small group of round sporanges. In our American species here described, these sori have various forms. But it is convenient to consider them under the same generic name, till their relation to sterile fronds, or their true generic affinity can be ascertained. To this genus, therefore, I refer all agglomerations of sporanges of various forms, either borne upon separate plants, or upon separate segments of a plant, like those of our species of Botrychium, without visible remains of leaves, or whose connection to frond-bearing leaves can not be traced, and is unknown.

No species referable to this genus has been found as yet in the Carboniferous strata of Europe, a fact which led Paleontologists to suppose that ferns bearing fruits in separate panicles did not exist at the time of that formation. From our Coal Measures, we have previously obtained only Staphylopteris stellata, Lesq., Arks. Geol. Rept., vol. ii, p. 309, pl. 2, fig. 2 and 3, from the Sub-Conglomerate coal of Arkansas. The discovery and publication of the following species is, therefore, a valuable contribution to the fossil flora of the coal.

Staphylopteris Wortheni, Sp. nov.

Pl. xiv, fig. 1 and 2.

Frond bi-pinnate, ovate lanceolate in outline; pinnae linear, gradually tapering to an obtuse point, short, one inch long near the base of the frond, scarcely half an inch near the top perpendicular to the main rachis; pinnules alternate triangular, formed of an agglomeration of three or five sori apparently attached to a main pedicel, but without trace of leaves. The main rachis of this fruiting segment of a fern is proportionally thick, three lines at its base, finely irregularly striate, the branches or pinnae appearing attached rather upon it or
around it than along its borders; the rachis of the branches is also thick, smooth, and on both sides of it are attached the groups of *sori*, three to five in number, in a kind of pyramidal position, with a thick short pedicel in the middle. The *sori*, when unopened, are round, marked on the flattened surface by four or five lines diverging from the center to the circumference. Fig. 2a. When opened the sporanges appear placed like the rays of a star around a central point. These sporanges, oval, elongated or gradually enlarged outwards from the narrow point of attachment, deeply concave, finely striate within, are all turned to the same side, viz: the point downwards and the branches tending obliquely upwards; in that way the upper *sori* of the pinnae have the point towards the rachis, while in the lower ones it is turned from it: see fig. 2, enlarged twice, and fig. 2b, enlarged four times. The sporanges are deeply marked or excavated in the stone, which is still more deeply penetrated by the point, and this point appears, as said above, to have been attached to a common pedicel by filaments now destroyed.

Found in a concretion from Mazon creek; discovered by Mr. M. S. Hall.

**Staphylopteris asteroides, Sp. nov.**

*Pl. xiv, fig. 6 to 8.*

**Frond** tripinnate, with straight alternate branches; primary pinnae lanceolate pointed or tapering to a point from an enlarged base; secondary divisions alternate linear, merely formed of narrow, filiform, obliquely straight branches or common pedicels, bearing groups of sporanges pinnately attached to them in pairs and opposite; *sori* round at first and before maturity, opening at maturity in five lanceolate-pointed laciniae around a central round point, and forming a star (fig. 7 and 7b enlarged).

This fruiting species is still more remarkable than the former. Groups of *sori* resembling round dots, fig. 8, are seen on the same piece of shale, but on
Haplopleura

1. Haplopleura, sp. - specimen of Butl. N. 200. 2000. Specie very similar to S. sagittalis. The sporangia are simply-celled with a single dehiscence ray from upon 4 acetabla. There are, 9 cells, thin, obtuse at both ends, slightly enlarged at base, and truncate at the point of attachment. One cat, 12 mm. long, three millimeters broad. The rows of spores are in series of each other. The spores are thickly, alternately branching branches supporting the spore, very thick, 3 spores nearly round. I cannot find any relation to this in the literature. 1. 40.8. Conspicuous doubts. Genus a branch of sporangia must both this, and others. A. 526, pp. 103, 1109.

2. 2. In the book Dictionnaire botanique de Baillie, p. 106, there are 1000 sporangia, a capsule, 1500, etc. with an elastic annulus, which surrounds the capsule, suggesting the correctness of the present.
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(c) The remaining fragment of the right lobe, and also the left, are presented to you in a similar but less complete state. The figure is a sketch of the fragment as presented to you, the larger part of which is not to scale. The fragment is divided into three parts: the outer, middle, and inner lobes. The outer lobe is the largest and is divided into two parts: the superior and inferior lobes. The middle lobe is the smallest and is divided into three parts: the anterior, posterior, and lateral lobes. The inner lobe is the smallest and is divided into two parts: the dorsal and ventral lobes.

Sphenopterus Hominghanni, Duft. 1893, J. Geol. 9: 71. This fragment appears to represent the posterior part of the fragment as presented to you. The fragment is divided into three parts: the outer, middle, and inner lobes. The outer lobe is the largest and is divided into two parts: the superior and inferior lobes. The middle lobe is the smallest and is divided into three parts: the anterior, posterior, and lateral lobes. The inner lobe is the smallest and is divided into two parts: the dorsal and ventral lobes.

Sphenopterus (Calymenotherium) Hominghanni, Stü. 1906, J. Geol. 9: 71. This fragment appears to represent the posterior part of the fragment as presented to you. The fragment is divided into three parts: the outer, middle, and inner lobes. The outer lobe is the largest and is divided into two parts: the superior and inferior lobes. The middle lobe is the smallest and is divided into three parts: the anterior, posterior, and lateral lobes. The inner lobe is the smallest and is divided into two parts: the dorsal and ventral lobes.

For your reference, the figure as presented to you is a sketch of the fragment as presented to you. The fragment is divided into three parts: the outer, middle, and inner lobes. The outer lobe is the largest and is divided into two parts: the superior and inferior lobes. The middle lobe is the smallest and is divided into three parts: the anterior, posterior, and lateral lobes. The inner lobe is the smallest and is divided into two parts: the dorsal and ventral lobes.
Sphenopterus subalbatus. — Pp. of 1651, 1652, 1653 from Magoula, they
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FOSSIL PLANTS.

the reverse. They apparently belong to the same species, and seem to have been detached before maturity from their pedicels, whose remains are still marked by dark lines, fig. 8, fig. 9, enlarged twice, and fig. 10, enlarged about ten times. In this last figure dark but absolute lines are seen, apparently showing the suture of walls. In the pinnately divided part of the frond, fig. 6, all the sori are opened, and their envelope is still attached to short pedicels, apparently placed opposite to each other. The details of the form of the fronds are easily recognized, but those of their ramifications, or the point and mode of attachment of the sori are rendered indistinct by the superposition of the groups of sporanges. The specimen is on shale from Morris, and was contributed by Mr. Jos. Even.

Staphylopteris sagittatus, Sp. nov.

This species has a bi-pinnate frond, as seen on a specimen from the shales of the coal at Morris, too large to be figured. The divisions are alternate; the thick secondary rachis is de-current on the main stem, which is also broad and smooth. The double celled sporanges are linear, attached by their backs, and pressed against each other in horizontal rows. The enlarged pedicel of the sporange cells is, before maturity, apparently at least, folded in the middle, and both rows of sporanges are joined together by their back, forming in that state slightly scythe-shaped cylinders, obtuse at both ends, attached to the pedicel by a dorsal membrane, and marked all around by the ring-like outlines of sporanges (fig. 3a). More generally the sporange-cells are open side by side on each side of the dorsal support, and the sporanges appear then in two convex rows, fig. 4 and 5. In some specimens on concretions from Mazon creek, where small branches of this remarkable species are finely preserved, the sori or sporange bearing cells are deeply immersed in the stone, generally leaving around them an empty space, as seen in fig. 3b and 3c; they are thus isolated and their form is easily ascertained. No traces of leaflets have been seen in connection with this species, which has as yet been obtained only from Morris and from Mazon creek.

Sphenopteris scaberrima, Sp. nov.

Frond tripinnate, primary pinnae lanceolate, curved downwards, flexuous; secondary divisions perpendicular to the verrucose, broad, round rachis, linear lanceolate pointed, one to two inches long, distinct and somewhat distant alternate; pinnules lanceolate acute, gradually diminishing to the point, distinct to the base, horizontal, irregularly cut on the borders or entire with borders irregularly expanding and undulating by crushed groups of sporanges or of scales; surface rugose, marked by round small convex points resembling small dots, produced by groups of sporanges placed on the lower surface. All the plant, even the thick, primary rachis, is covered with verrucose points, evidently indicating the base of scales, or hairs, with which the plant was covered, and which are still indistinctly seen on some part of the secondary branches. The frond of this species was evidently a large one, the pinnae being more than six inches long.

The whole appearance of the plant is like that of some species of Cheilanthes of our time, especially of Cheilanthes vestita, Schwarz. The species should therefore be classed in the genus Cheilanthes, Gopp. Nevertheless, the group of sori appears to cover the whole under surface of the leaflets, a position which is not similar to that of the sori of a Cheilanthes. On shales from Morris.

Sphenopteris gracilis, Brgt.

Frond bi or tripinnate; primary pinnae or fronds triangular in outline, taper-pointed, slender; secondary pinnae linear lanceolate, alternate and distant, open, curved upwards, flexu-
Sphenopterus (Sphenopterus) culebra Burt. with H.C. This is the species of Major with a very fine well marked specimen of this species no difference. Sph.

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1. *Sphingitis linearis.* Pr.B. No. XXIII. This species is very closely alluded to by *S. linearis.* It differs essentially, by the greater, both secondary and tertiary distinctly disked, the much more characteristic (R) and the formula entirely differing and forming wings along the rachis, the much shorter, more erect and deeply divided, and by the nervature, the rachis, being almost equal, parallel and more numerous. The ultimate leaves of 5-10 linear ones present, distinctly lobed, ovate to oblong, two and an half centimeters long, with four pairs of alternating formulae in the terminal one, three of the pairs are lamelate. A fringed lower. The linear leaves narrower, longer ultimate, from five to eight in length. with 10 to 18 pairs of formulae, more erect and more deeply lobed, with lobes divided in two, and an other point, and not flat. the two lower pairs of formulae are very small, nearly two millimeters long, and a broad with those above an 15 millimeters long and wide eight millimeters broad at the base. This species is indeed remarkable and distinct as much by its character, its leaves, or it join as by its nervature.

2. *Sphingitis linearoides.* Pr.B. No. XXIII 2, j. 3 from B. Bette, which shows the general characters of form of *S. linearis.* Lobes, and the nervature. See the description of the leaves, p. 92. (3) make it so it as it is equal remarkable that this species is too large for figure.

3. *Sphingitis linearoides.* Pr.B. No. XXXIX 2. The specimen from Prussiifeld, very referable to the species of Pr.B. though also somewhat related to. What I have considered as the species in. Pr.B. No. XXXIX 2, 516. Which, according to Schmiede, is not S. regalis. By the specimens there is only a branch, ultimate, from linear, lanceolate in outline, nearly lobate, the lobes 9-10 pairs alternate, open at the base to the apparently smooth, narrow, straight, nearly parallel, lobed the round or ovate leaves, divided to the middle, the pair on each side with a broad very obtuse half round formula. The primary lobes in formula, become gradually shorter to wide, the top of the formula then division whole and more constricted. The upper formula being these, the much oblong, obtuse as to the rachis. The lower one, as 6-7 millimeters long, the upper one, only two.

The range of the last divisions to be divided by the leaf veins, apparently of the same type as *S. linearoides.* Whether, the epidermis is remarking the underlying thorns of different kinds. I shall be present for the collection andallowing being come with most points very close to each other, or having a remarkable, but in the description of the conchae, for the further comparison I. B. H. 8916, "H. H. Wautier," says that the last parts, from it and the (alternate tooth calcareus) eleven, while these and distinct to the pure, which is then more like the species in **32** of the *Fl. Reg.** wh. (I am informed) to be the species in **32** of the *Fl. Reg.*
FOSSIL PLANTS.

ous, bearing alternate divisions, cordate, lanceolate in outline, deeply cut on each side in three to five irregular obtuse or pointed lobes, as seen in fig. 4, 5, 6, enlarged; medial vein somewhat inflated like its pinnate divisions, which branch once or twice to the borders, according to the size of the lobes.

The surface of the leaflets is quite smooth. By its slender, half round secondary and tertiary rachis, and the general form of the pinnae and of the divisions, our species agrees well enough with that published by Brongniart, Veg-Foss., p. 197, pi. 154, fig. 2. But the author describes and figures the lobes of the pinnules as being more regular, longer, regularly tridentate at the point, while those of our specimens are always either more or less irregularly cut, or entire, and also either pointed or obtuse. The difference in the form and size of the lobes of the pinnules of the same pinnae, indicate for this species, as seen from our fig. 4, 5 and 6, a great disposition to vary, and the more essential characters being identical, I can but consider the American specimens as representing the same species as that of Prof. Brongniart.

It is found in fine large specimens on the shales over the coal at Morris.


This species is the same which, from incomplete specimens, was in the second volume of this Report, page 433, considered as doubtfully referable to Sphenopteris rigida, Brgt. It has a tripinnate or polypinnate frond, the specimens being covered with numerous secondary pinnae, of which one only is figured here. Pinnae branching at a right angle from a broad winged smooth rachis, bearing alternate lanceolate secondary divisions, with a half round comparatively broad and regularly sinuous rachis. The pinnules obliquely attached upon each of its convex flexures are oval, lanceolate pointed, regularly divided on each side into three to five half round lobes. The medial vein which, like its divisions, is thin and somewhat obscure, alternately branches into each lobe of the pinnules, the branches forking above the middle. The epidermis is thick, the surface convex and somewhat rough. This species appears essentially distinct from Sphenopteris rigida, Brgt., by its broad winged rachis, the form of the pinnules and of their divisions, the slightly rough surface, etc.; nevertheless there may
be some error of description or of illustration of the European species, which is marked as having its surface entirely smooth, while the figure shows it covered with points or rugose.

Abundant in the shales of the coal at Morris.


Pl. 53, fig. 3.

In the shales of Colchester; found by Prof. A. H. Worthen.


Pl. 53, fig. 1 and 2.

Two fine specimens of this species have been obtained from the concretions of Mazon creek; by Mr. M. S/ Hall.


In preserving this genus, with its characters too vaguely defined as it is in vol. 2 of this Report, p. 436, it would be advisable to subdivide it as follows:

§ 1. *Hymenophyllites* proper, containing species with a generally membranaceous delicate frond, pinnately divided, the primary divisions alternate or dichotomous, decurrent on the rachis and ultimate lobes linear obtuse, either simple alternate or irregularly divided; nerves percurrent pinnately branching, ascending, simple in each lobe. This section contains *Hymenophyllites* and *Trichomanites*, Gopp.

§ 2. *Aphlebia*, including species with fronds of various sizes and forms, generally with a broad rachis and more or less irregularly divided, the divisions rather dichotomous or pinnatifid, entire or variously laciniate lobed, the lobes sometimes enlarged and recurved; veins parallel and numerous from the base of the fronds, dividing in fascicles from the rachis in each primary division, and passing by subdividing, as simple veinlets to the point of each lobe. To this section are referable the genera *Aphlebia*, *Schizopteris*, *Rhodea*, *Pachyphyllum*, etc. auct.*

*W. P. Shimer, in Pal. Veg., makes for this section a new genus, *Rhacophylhon*.**
...
Both the specimens 1649 and 1670 agree very closely approaching a young Pinus, March 26, 1671, Fig. 1651. The lower part, being in a more advanced stage of growth, shows a more distinct alternation of the scales. The needles are arranged in two opposite rows, and are fully developed. The wood is hard and close-grained, with a strong resinous odour. The cones are small and slender, about 1 inch long and 3/4 of an inch broad. The seeds are numerous, about 300 to the cone. The bark is thin and fibrous. The leaves are needle-like, about 3 inches long, and 1/4 of an inch wide. They are arranged in opposite pairs, and are closely attached to the branches.

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§ 3. *Schizopteris* proper, to which belong the species with a frond generally laciniate, or cut in linear erect or curved divisions, sometimes enlarged at the top, marked with thin parallel veins ascending from the base of the frond to the top of the lobes without branching, being split in fascicles with the divisions. To this section belong merely the genus *Schizopteris*, as characterized by Prof. Brongniart for his *Schizopteris anomala*.

It is difficult to separate these sections in genera by reliable and permanent characters. Some of the species which are considered as *Schizopteris* by authors, as *Schizopteris adnascens*, Li. and Hutt, for example, have the nervation and a mode of division of their fronds similar to those of some *Hymenophyllites*, while species referable to this last genus have, with a regular mode of division a nervation by disconnected fascicles of veins, like species of *Aplilebia* and *Schizopteris*. This is the case with our *Hymenophyllites splendens*. The plants of the two last divisions are little known, their apparently soft tissue having often been destroyed by maceration. I have described and figured here some remarkable forms, especially from the concretions of Mazon creek, whose study may throw some light upon the nature and conformation of these singular vegetables.

§ 1. *Hymenophyllites* (proper).

**Hymenophyllites alatus**, Brgt.

*Veg. foss.*, p. 180, Pl. 48, fig. 4.

This species is mentioned in the Ill. Geol. Rep., vol. ii, p. 437, as presenting some characters at variance with the European one. Good specimens of it from the concretions of Mazon creek, show it to be identical.

**Hymenophyllites tridactylites**, Brgt.

*Veg. foss.*, p. 181, Pl. 50.

Good specimens of this fine species have been lately procured from the roof shales of the coal at Morris, by Mr. S. S. Strong.

**Hymenophyllites trichomanoides**, Brgt.

*Veg. foss.*, p. 182, Pl. 48, fig. 3.

A small specimen from the same place as the former.
Hymenophyllites myriophyllum, Brgt.

Veg. foss., p. 184, Pl. 55, fig. 2

The straight, strong main rachis and its branches, like the form and divisions of the leaflets, entirely agree with the author’s description and figures of this species. Some of the terminal divisions of the pinnules appear on our specimen as slightly inflated at the point. It is not possible to see whether this swelling is caused by fructification, or by the remains of some part of the half destroyed epidermis.

Roof shales of the coal at Morris, contributed by Mr. S. S. Strong.

Hymenophyllites Schlothaeimii, Brgt.

Veg. foss., p. 193, Pl. 51.

This species should be placed in its natural order after Hymenophyllites tridactylites, Brgt., but our specimen, a very fine one, is described here from the remarkable likeness of its divisions when deprived of their epidermis, with the former species. Except a few entire leaflets which have preserved their integral form, the whole specimen represents merely the veins and their divisions, without any substance of the leaflets attached to them; in that state, the species could easily be confounded with the former or considered as a new one.

From the same place as the former, and due also to the successful researches of Mr. S. S. Strong.

Hymenophyllites delicatulus, Brgt.

Veg. foss., p. 185, Pl. 58, fig. 4.

This species, also from the shales of Morris, could be admitted, by some of its parts deprived of their epidermis, as identical with that of the same name of Sternberg, which has been considered as a Cheilanthes by Gippert. The thin membranaceous substance of the pinnules in our Hymenophyllites, is generally partly or totally effaced by maceration.
The present is an everyday kind of business. It is the most common kind of business. It is the kind of business that is conducted by all persons, and it is the kind of business that is conducted by all persons.

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Sphenopterus, Council, Brit. Pl. The species belong to the order of Diptera, and are distinguished by the following characters:

1. Head: the head is elongated and pointed, with a prominent mouth and compound eyes.
2. Thorax: the thorax is broad and robust, with three paired legs.
3. Wings: the wings are transparent and membranous, with a network of veins.
4. Abdomen: the abdomen is segmented and bears several pairs of legs.

The species are commonly found in damp, shaded areas near bodies of water.
The fragment in question, referring to a Phyllophyte Plant of the order Phyllophytae, as described by Murray, is as follows:

**Phyllophytae (Diplostemon) subgenus to state.** Two specimens from Aden, No. 57 represent apparently the species as figured by

Murray, fig. 10. bushes mentioned in the text, Murray, fig. 11. bushes measured in the top, the base of the basal division of the same, broad, slightly diminished in the middle, the entire plant, all the divisions of the 2nd order, in two, the upper one twice, the terminal simple, all the divisions between, the entire plant, the primary pinnae, exactly in right angle to the axis, each pinna, one or two, more or less inclined upwards. The secondary axis is simple. Compare this figure with the figures of Phyllophytae, fig. 10, of Phyllophytae, fig. 11, and correct differences.

I,则修言老。
Hymenophyllites tenuifolius, Brgt.

*Veg. foss.*, p. 190, Pl. 48, fig. 1.

Well characterized by its straight broad rachis, the position of the pinnules, the narrow lobes, etc. The epidermis is also partly destroyed.

Roof shales at Morris; a small specimen.

All the foregoing species of *Hymenophyllites* are described as *Sphenopteris* by the author.

Hymenophyllites splendens, Sp. nov.

*Pl. xix, fig. 2a and 2b.*

Frond tripinnatifid; primary pinnæ at a right angle to the flattened main rachis, broadly lanceolate in outline; secondary pinnæ alternate, narrowly ovate-lanceolate, oblique decurrent on the flexuous alate rachis, alternately two or three lobed on each side, the lobes divided in two or three lanceolate, somewhat obtuse teeth. Veins in fascicles from the base of the secondary pinna, separating in each lobe, one of the divisions ascending to the point.

The surface of the whole plant is polished shining, of a reddish brown color. This species resembles the variety of *H. furcatus*, Brgt., called *H. membranaceous*, by Gutbier, which is common enough in Pennsylvania, especially in the upper part of the sandstone at Pottsville and Mauch Chunk. It differs, however, essentially, by the thick substance of the leaves which easily separates from the stone, by much thicker veins, merely approached in fascicles but not united at the base of the secondary pinna, which are longer, narrower, more equally and pinnately divided in lanceolate pointed teeth.

This species appears intermediate between *H. furcatus*, Brgt., and *H. stipulatus*, Gutb. 

Abundant in the roof shales of the coal at Colchester and Morris.
Hymenophyllites inflatus, Sp. nov.

Pl. xvi, fig. 6.

A tripinnately divided part of a frond, with primary divisions broadly oval in outline pinnately cut into alternate obovate obtuse inflated lobes, either simple or parted again in short obtuse divisions; nervation obsolete, the veins Apparently branching in each division of the leaves, and simple.

This species is intermediate between the two sections of Hymenophyllites, having the mode and regularity of division of the first, the thick inflated leaflets without distinct nervation, like some species of the second. It is distantly related to Sphenopteris Rutefolia, Gutb., Verst., p. 42, pl. x, fig. 10 and 11, from which it differs by the form of its more elongated, narrow, inflated pinnules, by the obsolete nervation, etc.

From the roof shales of the main coal, Duquoin.

The specimen is a large piece of shale covered with fragments of the plant, none larger than the one figured.

§ 2. Aphlebia.

Hymenophyllites adnascens, Ll. and Hutt.

The two specimens figured, pl. xvi, fig. 7 and 8, from the roof shales of the coal at Morris, exactly represent the species of Lindley, as it is figured and described by Geinitz, in his Versteinerungen, p. 20, pl. xxv, fig. 7 to 9. But I cannot recognize an identity between the plants represented in these figures. The one, fig. 8, of ours, has the lower divisions short lanceolate obtuse, irregular in their directions, with thin parallel veinlets, and the upper ones narrower, curved, marked also by thin parallel veins branching into each lobe; while the other, fig. 7, has dichotomous or forking, linear, narrow branches, without trace of veins or veinlets. The first of these forms agrees with the description and figures given by Lindley, vol. 2, p. 58, pl. C and Cl, who compares the plant to some Lygodium or Hymenophyllum, but I am disposed to consider the other as a peculiar species. Our fragments are nevertheless too small to allow a precise and satisfactory description. Prof. Lindley considers his species as a climbing fern, twisted round the stem of a frond of Sphenopteris crenata, to
one inch wide... only... included with... scattered... somewhat large... points... primary... secondary... alternate... points... alternate... points... ultimate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... alternate... 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1. Phalacryphile giganteum Ait. 1681. 1. A fragment of Phalacryphile with primary stipes a dim ramification, without branches, or dichotomous, each ramification, or stipe, as it may be called, bears a ramification of ramifications from the primary, as is shown in the figure. At the base, a ramification branch is formed, which is a ramification, or dichotomy, as it may be called. This ramification branch is elongated, as the process of branching, or ramification, is a process of dichotomy. The ramification branch is elongated, as the process of branching, or ramification, is a process of dichotomy. The ramification branch is elongated, as the process of branching, or ramification, is a process of dichotomy. The ramification branch is elongated, as the process of branching, or ramification, is a process of dichotomy.

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3. Phalacryphile giganteum Ait. 1681. 1. A fragment of Phalacryphile with primary stipes a dim ramification, without branches, or dichotomous, each ramification, or stipe, as it may be called, bears a ramification of ramifications from the primary, as is shown in the figure. At the base, a ramification branch is formed, which is a ramification, or dichotomy, as it may be called. This ramification branch is elongated, as the process of branching, or ramification, is a process of dichotomy. The ramification branch is elongated, as the process of branching, or ramification, is a process of dichotomy. The ramification branch is elongated, as the process of branching, or ramification, is a process of dichotomy. The ramification branch is elongated, as the process of branching, or ramification, is a process of dichotomy.

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71. The monopodites of Solenostomus. Pp. 106, 107, 108, Fig. 2. Nothing to add to the description of this species, merely to connect it with the mode of branching indicating a second basal dichotomy. The roots are fourth divided, and a third point of each side and evidently have the same mode of divisions as in the former mode. Undoubtedly, as is again pointed out by Dr. E. Streeter in this species, there has not been any other parallel of this character in that which is figured under previous parts, and which was given to the genus, but the root will be found in the present to have been reduced to a mere vestige, the connective tissue being smooth through the bony part of the root, like that of the

2. Hypermegalobranchias laevis. (S. 106, 107, 108, Fig. 2.) Pp. 106, 107, 108, Fig. 2. The same remarks as in the former species, but the species great difference by its monopodites. The branches in this case the mode of development of a very free species, and the

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6. Hypermegalobranchias laevis. (S. 106, 107, 108, Fig. 2.) Pp. 106, 107, 108, Fig. 2. The same remarks as in the former species, but the species great difference by its monopodites. The branches in this case the mode of development of a very free species, and the
FOSSIL PLANTS.

which it is evidently attached, while Prof. Geinitz thinks that it is fixed in small bundles to the stem, like a parasitic plant. The State Cabinet at Springfield possesses specimens of a large fern whose stem, like that described by Lindley, is bordered by bundles of leaves of the same Hymenophyllites. The specimen is obscure, and it is not possible to decide how they are attached to it.

**Hymenophyllites lactuca, Gutb.**

This species is more rarely found in our Coal Measures than its near relative, *H. Clarkii*, Lesq. The State Cabinet has a very fine specimen of it in a concretion from Mason creek. It is distinguished from *H. Clarkii* by its broad enlarged fronds and narrow laciniae. These fronds or rather pinnæ, on one side of the rachis, which are only visible in part, appear placed in a row; like the alternate divisions of a fern. As the epidermis of some of these pinnæ is destroyed by maceration, the veins and veinlets are distinct, and are seen passing in bundles from the rachis, separating more and more in curving into each division, to end by a simple veinlet, ascending to the point of the acute ultimate lobes.

**Hymenophyllites arborescens, Sp. nov.**

Pl. xvii, fig. 1.

Stem long, (the specimen, though broken, shows more than one foot of it,) straight, about one inch broad at its lower end, two-thirds of an inch at its upper part, marked in its length by obscure lines apparently formed by bundles of veinlets and alternately divided in thick oblique branches, more or less regularly and deeply lobate; lobes alternate, simple and linear elongated, or bi-trifid, of various lengths and obtusely pointed.

The divisions of this plant are rather dichotomous, like those of species of *Lycopodiacea*, than pinnatifid like those of ferns. They are merely a continuation of a main axis thrown out in various directions. The substance appears to have been a compound of cellular soft tissue, intermingled with bundles of continuous vessels, forming veins or veinlets, and, by mere separation, ascending to the last divisions of the frond. There is no trace of branching of veins,
but merely of divisions of fascicles of vascular tissue. The species, in its general form, resembles Schizopteris pachyrachis, a species of the Keuper.

Found at Morris on a large piece of shale, and kindly presented by Mr. Jos. Even.

**Hymenophyllites Clarkii, LesqX.**

Pl. xvi, fig. 1 and 2.

The description of this species is given in vol. ii of this Report, p. 438, pl. xxxix, fig. 7, from a small specimen. It is abundantly found in the concretions of Mazon creek, and, though very variable, preserves the characters which separate it from H. Gutbierianus, Gein., viz: its broad, round, or very obtuse divisions, and the great thickness of the leaves, which were evidently hard and coriaceous; for they are not flattened on the stone as in H. Gutbierianus, but enter it, and mark on it a deep impression, as a hard body only can do. Of the two remarkable specimens figured here, the first appears to represent a plant with a long twisted or climbing stem. The principal axis is round, grooved, and has its surface roughened, and marked with points or scars, as if it had been covered by hairs or scales. As the stem of the second specimen, which seems to represent a young plant evidently of the same species, is smooth, these points may be the scars of rootlets or suckers, serving as adhesive agents to help the climbing process. The young plant, fig. 2, has a short stem already curved or twisting, and at its base, some filaments resembling rootlets. It would, therefore, be rational to conclude, from these specimens, that the plants which they represent were attached to the ground or to some soft substance, like decayed wood, by rootlets, but were at the same time climbing plants. This would explain the position of H. adnascens upon the broad rachis of some ferns.

**Hymenophyllites Guthierianus, Ung. Gen. and Spec., p. 132.**

The true species, as figured by Geinitz, is in the State Cabinet, in specimens from Colchester, found by Prof. A. H. Worthen.
Hymenophyllites Clarksii, 1870. This is in the cabinet of M. J. Shaw, a pigeon's
feminum of this species. It measures 23 and 1/2 cent. broad, with oblanceolate
dehiscing serra. It is in fr. XVI of the genus, but longer with obtuse renuncio.
Rachis found in the upper part. The same collection has the gutters narrower
larger than the former, but the serra are longer, narrower with narrow flat
not inflated subdivisions which are linear oblong only at the point and
distinctly round.

Hymenophyllites Clarksii, June 1873. Being more than 1/2 cent. thick
in some one, open with large, thick, corky, tendril-like leaves. The
midrib forms a distinct being much longer, 10 cent. length, open
at the same time. The leaves on all of these are incised
in III to IV, with inserted the top transverse leaf on the other
midrib. The outline being made only a little parallel in the
serra 683 a, was a specimen with the necessary "fr. XVI."

Hymenophyllites Pterophyllum (phacellatum) var. The same type.
694 of the same. It is the green flag to the H. phacellatum. But both
apparently tend not gradually entering up and over and phaceu-lum
would nearly equally divided in length of two along or linear, thick, separa-
ted by pistil, with the primed side along to the tips, diverging from each other.

Hymenophyllites. Pterophyllum (Phacellatum) var. The same type.
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ted by pistil, with the primed side along to the tips, diverging from each other.

Hymenophyllites Clarksii, 1870. June 1873 a. Shows part of
a serra of this species with a secondary serra of the same attached
to the rachis. The rachis is apparently uncinate, flat and smooth, the
serra 1/4 cent. and short, with a broad, obliquely dehiscing. Half a cent.
length of the same, 1/4 cent. long, enlarging upward 1/4 oral. The cent. broad.

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a serra of this species with a secondary serra of the same attached
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length of the same, 1/4 cent. long, enlarging upward 1/4 oral. The cent. broad.
The periphery is not as wide as in the previous species. The distance between the lower and upper parts is narrow. The upper part is more robust, and the lower part is more elongated. The species resembles a different species. The shape of the fruit is unique, and a specimen was described by Dr. Lycett of the species in a previous note.

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1. Ephedraeae Chorotypicae. Are there thought signals comparable to color codes? (Hint: Yes. Each flower.)

2. Ephedraeae Stipitatae. Are the flowers of Ephedraeae Stipitatae those of Ephedraeae Chorotypicae? (Yes.)

3. Ephedraeae Longipineta. Are the flowers of Ephedraeae Longipineta those of Ephedraeae Stipitatae? (Yes.}

Note: The text appears to be a mix of scientific references and possibly a page from a book or document. The content is not clearly legible due to the quality of the image.
1. *Hympophylla*. The former name for the specimen in the Museum, No. 43, is *Hympophylla* l.<br>
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Hymenophyllites thallyformis, Sp. nov.

Pl. xvi, fig. 3 to 5.

The specimen here figured, represents only part of a frond, which, in its whole, appears to have been large and roundish in outline, with undulate borders and undulate rugose hairy surface. From the emarginate border of the frond, protrude cylindrical branches, either erect or creeping, whose form is totally different from that of the frond. These branches, half an inch thick, are covered with ob-lanceolate, obtuse scales or leaves, narrowly striate, as marked, fig. 4, enlarging upwards and closely imbricate. As the scales are mostly crushed upon each other, it is not possible to see if these stems are fruit-bearing, like the branches of a Lycopodium, or are merely the base of the stems of some fronds of ferns, and thus only a different representation of the same organs of the plant. The specimen is good, the various parts of the plant are distinct, and the connection between the branches and the frond is evident.

This kind of development may be compared to that of the Marchantiaceae and of the Lycopodiaceae with the fronds of the first, and the fruiting-stem of the last family of plants. I suppose that the fragment, represented fig. 5, belongs to the same species. It is apparently the plant in the first development of its frond. The specimen, fig. 5, is in a concretion from Morris; the other is on shale from Colchester. The same species has been found also on the shales from Morris.

Hymenophyllites Strongii, Sp. nov.

Pl. xviii, fig. 1.

Stem half an inch broad, erect, undulately veined or striate in its length, bearing alternate leaves? covered with long thick hairs or scales, diverging all around. It is not possible
to see the form of the leaves or divisions, which may be merely part of branches. On the left part of the specimen the stem is smooth and has the appearance of a stem of some species of *Hymenophyllites* of this section; on the other side, which is unhappily broken, the borders are fringed with long straight hairs, appearing to come out from another part of the stem. From this it is hardly possible to decide if the specimen represents a true *Hymenophyllites* or merely some disconnected part of a *Lycopodiaceae*ous plant.

In a concretion from Mazon creek, collected by Mr. S. S. Strong.

§ 3. *Schizopteris.*

*Hymenophyllites mollis*, Sp. nov. Pl. xviii, fig. 2 to 6.

Leaves or fronds formed of groups of thin filaments, emerging from a common support, apparently parasitic, enlarging in growing up or by grouping together, and by compression taking various forms; the laciniae or filaments are generally united together without distinct nervation.

This is still one of those singular plants of the coal epoch which baffles every attempt at analysis, when one is trying to compare them with representatives of our existing vegetation. This kind of vegetable is doubtfully referable to this section of this genus. Fig. 2 represents a kind of tubercle, resembling a piece of decayed wood, with traces of an axis in its middle and irregular cavities, bordered all around by a short fringe of these filaments which appear as growing out of it in an incipient state of vegetation. These filaments represented separately, fig. 3, are like linear, thin, short, obtuse laciniae, united together and without nerves, or with thin parallel veinlets. In fig. 4, these filaments, much elongated, are separated in the middle and near the base in various ways, appearing to come out from a mere point and to enlarge in ascending. In fig. 5, the point of attachment of the whole group of filaments is well marked, and from it, the laciniae seem to be attached or to grow upon one another like the subdivisions of a kind of *Fagus*. Fig. 6 represents a group or a heap of these filaments which appear attached and growing upon each
3. Hemysphylloides mollis. This form occurs in the same region and may be a dwarf variety of H. mollis, having a more compact and bushy habit, with shorter fronds. The fronds are usually 12-15 cm long and 6-8 cm wide, with a broad, rounded tip. The sori are small and scattered along the rachis, with a few linear sori towards the base. The spores are brown and oval, with a thin wall, and are dispersed by wind.

4. Hemysphylloides tephrodis. This form is similar to H. mollis but has a more slender habit, with fronds that are finer and more delicate. The sori are smaller and fewer, with a more compact arrangement along the rachis. The spores are also smaller and have a thinner wall, appearing more delicate in appearance.

5. Hemysphylloides tephrodis var. tephrodis. This is a var. of H. tephrodis, characterized by its more robust habit and larger fronds. The sori are larger and more numerous, with a more scattered arrangement along the rachis. The spores are larger and have a thicker wall, appearing more durable and resistant to environmental stress.
The species can not be compared as referred to articles, or account of the difference of the thickness of the panicle of flowers. They are indeed all equal in the base part and the dichotomous division of the same age, but in the upper part the florets are evidently to a compound flower, joint or ventral which do not asepate, nor divide, but become separated in their length and either parallel or move in various directions. Whole bundle of bracts.

In the same article, "Thamnochortus Duchesnei" is mentioned by Duchesne. This plant is said to have a "modified leaf," which is described as " modified to a point," and the "modified leaf" is said to be "perfectly concave." The species is said to be "much better among the genus" than it is among the "acutifolia."
...
It is generally agreed that the Conchoderinae, as a group, have large shells, with about 10 to 12 branches. The shell is typically elongated, with a smooth, glossy surface. The aperture is usually large, and the operculum is often calcareous and prominent.

The species described here, Conchoderinae sp., shows several distinctive features. The shell is elongated, with a smooth surface. The aperture is large, and the operculum is calcareous and prominent. The species is named Conchoderinae sp. Based on the description provided, it is suggested that the species is similar to Conchoderinae sp. described in the literature.

The scientific name of the species is Conchoderinae sp. This name is based on the description provided and is used to identify the species. The species is characterized by its large, glossy shell and prominent operculum. It is suggested that further research is needed to accurately identify the species and its placement within the Conchoderinae family.
FOSSIL PLANTS.

other like parasitic plants, the whole by compression being crushed, forming a kind of flattened ball. In all these varied appearances of the same plant, no distinct trace of a true nervation can be seen. The lines marked on the figures, exactly as they are perceivable on the stone, are more or less inflated in places, and can be considered, as well as the borders of the filaments, as true veins. They do not branch, and are mostly parallel. They may, nevertheless, represent the parallel groups of vessels which characterize the species of this section of Hymenophyllites. The substance of these plants was evidently soft, for the specimen fig. 6 represents a compound of many of these leaves appressed and crushed together, and the impression is merely of a thin surface.

All the specimens figured here have been found in concretions at Mazon creek, and nothing except Schizopteris anomala, Brgt., is comparable to this kind of vegetation.

Genus Pachypterys, Brgt.

Frond simply pinnate or bipinnately divided, bearing upon the same horizontal plan, opposite entire coriaceous pinnules, with a medial nerve, or without any trace of nervation, narrowed towards the base, not joined to the rachis. The peculiar disposition of the lobes or leaflets of these plants, is similar to that of the pinnules of some ferns. The genus was established by the celebrated author for two species of the Oolite of England.

Pachypterys gracillima, Sp. nov.

Pl. xix, fig. 6 to 8.

The specimen represents only simple branches or simple pinnæ, bearing on each side, but on the same plan, opposite very oblique, linear, oblong, obtuse, narrow leaflets, joined by their base to the enlarged border of the rachis, or of a medial nerve, and thus appearing decurrent upon it. The substance of the leaflets is thick, coriaceous, without any trace of a medial nerve. Fig. 6 shows, apparently, a peculiar kind of ramification by innovation.

The specimen from which the figures and descriptions are made, is on a large piece of shale whose surface is covered by a quantity of simple branches
of this plant. They are placed without any kind of order, crossing each other in various directions, as if they had been strewn on the stone, and therefore the kind of divisions marked in the figure, and abnormal, if this plant belongs to a fern, may be merely caused by the casual superposition of two branches joined by their bases. The form of the leaves, their peculiar position along the stem on the same side of it, resembling the divisions or lobes of some ferns, and their mode of attachment, indicate the close relationship of this plant to those published by Prof. Brongniart as *Pachypteris*. In some of our branchlets the basilar prolongation of the pinnules along the rachis of the pinnae has become detached by compression, and they appear in that way as bearing, at the base, a long, linear auricle. The pinnules are a little enlarged to the very obtuse point, as seen in fig. 8, enlarged four times, and in fig. 7, enlarged twice.

On shale, from Morris, collected by Mr. Jos. Even.

**LEAVES OF UNCERTAIN OR UNKNOWN AFFINITY.**

**Genus Cordaites, Ung.**


*Cordaites angustifolia*, Sp. nov.

The roof of the main coal at Duquoin and St. Johns is in places covered to a thickness of six inches to one foot, with remains of flat, narrowly equally striate, long linear leaves, one to one and a-half inches broad, which, as yet, have not been found in connection with any stem.

From their linear form and from the narrow striœ marking their surface, I refer these leaves to the genus *Cordaites*, Ung., being unable to see the characters which separate these ribbon-like leaves into two genera, viz. *Cordaites* and *Noeggerathia*. 
The difference between the planthorse and Cont. is marked
in this figure. Taken at random, a few of the teeth from M. B.
are larger, but at a distance the shape is more or less the same.

1847, Dr. C. A. G. of the Royal College of Surgeons, London, has made a study of the structure of the teeth of these animals, and has shown that the difference between the planthorse and Cont. is marked in this figure. Taken at random, a few of the teeth from M. B.
are larger, but at a distance the shape is more or less the same.
in a capsule, reach two millimeters long, one and an half mill broad,
form a short bractlet. 2 millimeters long, at an end, with the
main pedicel. The tube, appear, the three or four closed by the forming
this as a small bud, as in the figure. The point of attachment of the main
pedicel to the calyx, enameled by an irregular, and nearly oval,
I conclude the stem as representing, bearing male flowers, probably, of
a pistil, bearing very abundant of Canella. Two fragments, of which
fig 2, show upon the same specimen, fig 3, would represent the
fruit bearing bud, marked in the figure. Fig 2, C.29' 7.16
Fig 3, seem to represent a different piece, hablar, and a small,
being longer and narrower. I believe Conduct, to measure 6 and
matt in the middle, and measure about 10 and 1.5 cent. The interap-
node, between the two, fragment figured, being 30 cent. The
primary rows are distant three or, one millimeter, or 240 a millim.
I find so confirming the figure, that fig. 2, and fig 2 of my plot, upon
the fruit bearing part of, that Conduct, is a large shrubbery, composed
of C. lancea, found by Mr. Heath. 2. Canella, 2. conduct, with
C. martina, These two upon the pedicel thought to belong all
the fruit plants, with the plant under, frequently over 3/4
tower, the in caly, cushions are young, a part of a branch, with
the top, hand 4, 5. Conspice, for the main peduncle, comprising
the first three flowers, flowering and could also done, from the
plantage. 1. You men, 48 8 B. 2. The a branch, divided, that
branch at the top, a bundle of young or undeveloped buds of the space.
It form in the branch, or peduncle, 2 millimeters broad very gradually, 2 millimeters
of the same, if judged, that it is a millimeter. This kind, are such, that 3 1/4, each
and 2 1/2, cent. The small ones, for, not long. The tips, be a leaf, separation
involuted by the bract. This a fruit, different from the male flowers. Can means
the fruit, principal, two having, among them see the fruit, of a centan,
the tips, are the leaves, having the form of a segment.
With the points, downward, about 1 cent between, points, places
some, growing in quadrangular, 2 cent, or, one cent, and an half
abundance of the stem is, really, small or, thinly, irregularly, tend, at hand
half a millimeter. 1/4 millimeter, the stem of the flowering pedicel is
slightly disfigurable.
See that this male flowers of Conduct, represent well enough by
fig. of Darwin, as fig. in the Darwin's, 'i,' p. 214, 1866.
Pachyphyllum Mooyi: Two specimens, nearly identical, with leaves in the shape of an oblong triangle, the sides of which are produced beyond the middle, and have a rounded or pointed apex. The leaves are covered with a woolly pubescence, particularly on the lower surface. The flowers are small, yellow, and are borne in a terminal cluster. The fruit is a small, dry, and papery capsule, containing several seeds. The plant is native to South Africa and is commonly found in open, sandy soils. It is a hardy species and is often cultivated in gardens. The specific epithet, "Mooyi," honors Dr. P. C. Mooy, a Dutch botanist. The plant is sometimes confused with other species of the same genus, and further study is needed to clarify the classification. The flowers are visited by bees, which aid in pollination.
1. **Sedentary Home examination age.** The characters and remarks in these tables as given here are correct. It does not have any great men of this year on the mission except one very incorrect, and a few others.

2. **Sedentary Home examination age.** Compare good lists. Add and subtractions. The issue is in accordance to the stated plan. All the leaflets are ready, but copies of the reports only, with the other leaves: the printed materials are on a small sheet which will be given to the editor and each one has a special sign in these copies. See page 53, p. 15. The plan is not allowing broad, steady growth of the leaf record.

3. **Sedentary Home examination age.** One person is overloaded, if by any means possible.

4. **Sedentary Home examination age.** One person is overloaded, if by any means possible.

5. **Sedentary Home examination age.** One person is overloaded, if by any means possible.

6. **Sedentary Home examination age.** One person is overloaded, if by any means possible.

7. **Sedentary Home examination age.** One person is overloaded, if by any means possible.

8. **Sedentary Home examination age.** One person is overloaded, if by any means possible.
FOSSIL PLANTS.

Genus SPHENOPHYLLUM, Brongt.

SPHENOPHYLLUM CORNUTUM, Sp. nov.

Pl. xix, fig. 1 to 5.

Main stem round, half an inch broad, articulate at equal distances (about one inch), inflated at the nodi or points of insertion of the whorls of leaves, smooth but obscurely ribbed in the length, divided about at right angles by long straight branches bearing whorls of five or six leaflets, joined at the base; leaflets equal, fan-like in outline, broadly cuneiform to the base, divided from below the middle into seven to nine linear, pointed, nearly equal lobes; veins distinct, flat, four to five at the base of each leaflet, forking once, each division ascending to the top of one of the lobes (fig. 5 enlarged).

It is a well characterized and distinct species, and in studying it at Colchester, I have found among the shales a great number of broken specimens, representing different parts of it, and have seen all the leaflets, from the largest one around the broad part of the stems, to those of the branchlets, presenting the same form and kind of division. It can be compared only to a variety of Sphenophyllum emarginatum, Brgt., figured by Geinitz in his Verst. pl. xx, fig. 6. But it differs indeed in its essential characters: broader stems and leaflets, peculiar and equal divisions, and a different kind of nervation. The branching, as seen, fig. 1, is also peculiar for a species of this genus. It is worth remarking that the branches of this plant are mixed on most of the specimens with the remains of a somewhat obscure Calamites, resembling Calamites Suckowii, Brgt., a coincidence which may be casual. In any case I could not trace any evident connection between the two plants, and the stems of this Sphenophyllum do not appear as equally and deeply striate as are generally the branches of Calamites.

Roof shales of the Colchester coal.

Pl. i, fig. 6.

Nodule from Mazon creek; F. H. Bradley.

Fruiting catkins of Sphenophyllum, referable to Asterophyllites ovalis, Lesq. Penn. Geol. Rep., p. 851, pl. i, fig. 2, are found in the concretions of Mazon creek, and in the shales of Morris.


Annularia longifolia? Brgt.

Pl. xxi, fig. 1 to 3.

Stem thick, round, narrowly and equally striate, articulate, divided into opposite diverging branches placed crosswise in ascending, bearing at the articulations whorls of ovate-lanceolate obtusely pointed flat leaflets, marked by a broad medial nerve.

This species is represented in the concretions of Mazon creek, by two kinds of specimens, with different appearances. Those figured in our plates seem to belong to the upper, still undeveloped part of the plant. The branches and leaflets are crowded and pressed upon one another in a scarcely distinguishable mass, presenting sometimes, as in fig. 1, the appearance of a peculiar species of Sphenophyllum. In fig. 2, the branches and leaves are more distinct, and the form of the leaflets is distinguishable as marked fig. 3, magnified. On another specimen, which was obtained too late to be figured, and which shows the plant in its full development, the stem about one foot long, half an inch thick at the base, regularly striate in length, is articulate at the distance of one inch by whorls of leaves of the form described above, and two opposite branches diverging in open angles from under the leaves, and crosswise in ascending. The leaflets, one inch long, one-sixth of an inch broad, twelve to fourteen in each whorl, are joined at their base. The point of attachment of the leaflets upon the stem and the branches, is marked around the articulation by small, semi-lunar inflations or knots, corresponding in number with the leaflets, and placed just above the point of attachment. The plant represented by the two specimens figured, pl. 21, can be compared with what Prof. Geinitz has described and figured in his Verst., p. 10, pl. 16, fig. 1, under the name of Asterophyllites foliosus, Ill. and Hutt. The form of the leaflets being indistinguishable,
A

The species appears to be the same as


This unique feature is remarkable, as it is


The same difference is remarkable in the second beak, which has its beak expanded and


All these differences are easily identified by the


And the difference in size of the beak is


For their lengths, I will now


The beak itself is nearly as good as the


In conclusion, it can be said that the identity of the


The characters of the Anneula are well defined. p. 443 et seq.
from broader tests, than after it was. It will be necessary, however, to comprehend these figures more with the broader space, and to what extent does it apply.

Annularia. Where the annulus is the same species in the different species of Sphincter, the largest can be only 3/4 of an inch. The annulus would be comparable to the annulus of Sphincter, which is 3/4 of an inch. It is a species of the same species. The annulus of Sphincter is 3/4 of an inch, which is the same species. The annulus of Sphincter is 3/4 of an inch, which is the same species. The annulus of Sphincter is 3/4 of an inch, which is the same species.

Annularia. According to Kirby, this is a species of Sphincter, having three small spines in one of them, and a spiny spiculum from the central spiculum, which is the same species. The annulus of Sphincter is 3/4 of an inch, which is the same species. The annulus of Sphincter is 3/4 of an inch, which is the same species. The annulus of Sphincter is 3/4 of an inch, which is the same species.

325. 13 mill. long while a small spiculum of Sphincter, the largest can be only 3/4 of an inch. The annulus would be comparable to the annulus of Sphincter, which is 3/4 of an inch. It is a species of the same species. The annulus of Sphincter is 3/4 of an inch, which is the same species.
Arranlave longifolia. I refer the leaves of this species, especially a number of them picked up, clearly seen. When the stem is home, all the leaves are dark green, and a little thicker than the thick leaves, two centimeters long, two millimeters broad on a little more, bearing two or three, or four, the upper part only round. Small leaves is the name of the leaves, as seen in Fig. 3, 5, 5 a, an enlarged-

my plate, as on 30 of the branch of their, and three trees of the small leaves, which are exactly globular and attenuate, flattened, and as far as can be seen either whole or detached by a very short peduncle in the axil of the leaf, which are round if attached. The leaves appear to be in whole, and therefore the leaves seen in the axil of the leaf, which are round if attached. The leaves appear to be in whole, and therefore the leaves seen in the axil of the leaf, which are round if attached. The leaves appear to be in whole, and therefore the leaves seen in the axil of the leaf, which are round if attached.

Arranlave longifolia. I refer to Arranlave longifolia, while Geer, refer to Arranlave equisetiforme. The last author appears to be right for the fragment of an intertidal which I have published. Upon in A, a few on L of each of this kind, which I have published. Upon in A, a few on L of each of this kind, which I have published. Upon in A, a few on L of each of this kind, which I have published. Upon in A, a few on L of each of this kind, which I have published.
1. *unmura in sole* 32. I have compared still and run carefully the numerous specimens from the species, with those of *C. virginiana* and the new present, and almost distinct, the L have now in the museum and the different varieties they exhibit. The species, corresponding with the forms and various sizes of *C. virginiana* short or straw, from the North to the South, and often with narrow leaves. From Virginia we have the species also in varying forms and great differences, often indicated by the broad, long, and narrow leaves. One small specimen from Charlestown, No. 1, is characterized by small branches of the species being long and narrow only. No. 2 is Showkend, No. 3 is Charlemont. It is remarkable that although very adventitious in the species order, we have no instance of any division of the whole, as shown by no. 1.

2. *unmura in sole* 38. I have compared still and run carefully the numerous specimens from the species, with those of *C. virginiana* and the new present, and almost distinct, the L have now in the museum and the different varieties they exhibit. The species, corresponding with the forms and various sizes of *C. virginiana* short or straw, from the North to the South, and often with narrow leaves. From Virginia we have the species also in varying forms and great differences, often indicated by the broad, long, and narrow leaves. One small specimen from Charlestown, No. 1, is characterized by small branches of the species being long and narrow only. No. 2 is Showkend, No. 3 is Charlemont. It is remarkable that although very adventitious in the species order, we have no instance of any division of the whole, as shown by no. 1.

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4. *unmura in sole* 38. I have compared still and run carefully the numerous specimens from the species, with those of *C. virginiana* and the new present, and almost distinct, the L have now in the museum and the different varieties they exhibit. The species, corresponding with the forms and various sizes of *C. virginiana* short or straw, from the North to the South, and often with narrow leaves. From Virginia we have the species also in varying forms and great differences, often indicated by the broad, long, and narrow leaves. One small specimen from Charlestown, No. 1, is characterized by small branches of the species being long and narrow only. No. 2 is Showkend, No. 3 is Charlemont. It is remarkable that although very adventitious in the species order, we have no instance of any division of the whole, as shown by no. 1.
ble in the above mentioned figures, a close comparison with our species cannot be established. It is nevertheless evident that it does not represent the same plant as ours, as its stem, though striate, like a *Calamites*, is not marked like ours by any knots of the articulations. From the mode of division, the form and the size of its leaflets, this species of ours is a true *Annularia*. The one described and figured by Messrs. Lindley and Hutton as *Asterophyllites foliosus*, and which does not even resemble that of Geinitz, has linear lanceolate, pointed, narrower leaflets, and is not comparable to this, which I refer with doubt to *Annularia longifolia*, Brgt., considering it rather a distinct species, under the name of *Annularia calamitoides*, Schp. Prof. Schimper has published, in his Pal. Veget., p. 349, pl. xxvi, fig. 1, a new species which, though the leaves are narrower and more acute, is nearly related to this one, if not identical with it.

**Annularia inflata, Sp. nov.**

Pl. xx, fig. 1 to 3.

The essential difference which separates this species from *Annularia longifolia*, Brgt., consists in the form of the leaflets, which are ob-lanceolate, obtuse, subcylindrical or inflated upwards without trace of medial nerve, or with merely an obscure line indicating a central vessel, while the leaflets of *A. longifolia*, are flat, with recurved borders and marked by a thick, flat medial nerve. The difference in the form of the leaflets is seen in fig. 3 and 4, and their comparative sections, 3b and 4b. The stem of this species does not appear as thick as in *A. longifolia*, and the branches come out in opposite direction from the middle of the whorls, or rather from above them, than from below.

The specimens figured are from the concretions of Mazon creek, where both species are abundant, and may be distinguished always by the same characters, without any form appearing intermediate. It may be that we have here two parts of the same species, one representing branches growing out of or above water under atmospheric influences, with dry, flat leaflets; *A. longifolia*, the other, representing the floating part, sustained in water by bladderly-inflated leaflets, as shown in our species. But if it is so, it is peculiar that this, so different a form of a common species, has not been found elsewhere and described before.
Genus **ASTEROPHYLLITES**, Brgt.


**ASTEROPHYLLITES RIGIDUS**, Brgt.

Pl. xxi, fig. 4 and 4 b.

This species has been referred to *Asterophyllites longifolius*? Brgt, p. 444, vol. ii, of this Report. The whorls of the leaflets, very close to each other, indicate the top of a branch. The leaflets are about three inches long, not quite rigid, not open as in *A. rigidus*, but they are of a hard, solid texture, exactly linear, marked in the middle by a deep medial nerve, reflexed on the borders, canaliculate on the lower surface, thus presenting the true characters of *A. rigidus* as recognized by other and better specimens from the same locality—Mazon creek. The true *Asterophyllites longifolius*, Brgt., has been found on shales from Morris, by Mr. Jos. Even. It greatly differs from *A. rigidus* by its leaves, which are soft, flat, scarcely marked by the medial nerve, ascending along the stem and undulate, and by the narrower, nearly smooth stems and branches.

**ASTEROPHYLLITES GRANDIS**, Ll. and Hutt.

*Foss. flora, i, Pl. xvii.*

Found in fine specimens on the shales of the coal at Morris. Leaves still narrower, and whorls still more numerous than indicated by the description and plate of the English authors.

**ASTEROPHYLLITES FOLIOSUS**, Ll. and Hutt.

*Foss. flora, i, Pl. xxv.*

Not rare in the concretions of Mazon creek.

**ASTEROPHYLLITES TUBERCULATUS**, Brod., p. 159.

In the shales at Morris.
Astrophytum. - The specimens of this genus are made without ceremony. Tapas or big and are therefore subject to errors. They apply in this as Version and specific. In Ofis Ee Nam (175?)

In this genus, the petals are broader and more ovate, the sepals much longer, and the flowers are more numerous. The flowers are white or pink, and the petals are often five or six times longer than the sepals. The petals are usually five, but may be six or seven, and the sepals are usually three, but may be four or five.

Astrophytum, like many other cacti, is a tissue that is difficult to cultivate. It is best grown in a mixture of equal parts of peat moss and sand, and watered sparingly. The plant should be allowed to dry out between waterings.

The flowers of Astrophytum are showy and often very large. They are usually white or pink, and are borne in clusters. The flowers are fragrant, and the fruit is a capsule that splits open when ripe, releasing the seeds.

Astrophytum is closely related to the genus Cereus, which also has interesting flowers. The flowers of Cereus are often very large and showy, and are borne in clusters. The flowers are usually white or pink, and are fragrant. The fruit of Cereus is a capsule that splits open when ripe, releasing the seeds.

The difference between the two genera is that Cereus is more commonly cultivated as a house plant, while Astrophytum is more commonly grown as a garden plant. Cereus is also more commonly used in landscaping, while Astrophytum is more commonly used in rock gardens.

The flowers of both genera are showy and often very large. They are usually white or pink, and are borne in clusters. The flowers are fragrant, and the fruit is a capsule that splits open when ripe, releasing the seeds.
in the specimen of the glass. It is a large, long, red insect, with the head and anterior part of the thorax covered with short hairs. It is a beautiful reddish brown, with a greenish tint. The legs and thorax are covered with fine, silky hairs.

The structure of the head is very remarkable. It is oval in shape, and has a prominent, rounded snout. The eyes are large and prominent, and the antennae are long and slender. The mouthparts are well-developed, and the mandibles are strong and robust.

In the thorax, the pronotum is larger than the elytra, and the scutellum is prominent. The elytra are broad and rounded, with a fine, reticulate pattern.

The abdomen is divided into five segments, with the last segment bearing the genitalia. The legs are long and slender, with four tarsal segments each.

The structure of the legs is well-developed, with strong, robust tarsi. The tibiae and tarsi are covered with fine, bristly hairs. The claws are well-developed, with a strong, curved spur.

The wings are well-developed, with a fine, net-like pattern. The veins are well-defined, and the wing edges are smooth and straight.

The structure of the wing base is well-developed, with a strong, robust base. The veins are well-defined, and the wing edges are smooth and straight.

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Phoroxyphile aciphyllus. The description and figure of this species in Penn. Ann. and Nat. Hist. 2:111, 1896, are not satisfactory. The form described is confused with one in the Phoroxyphile section, but the flowers are 5 millimeters in length and 4 millimeters in width. The leaves are linear-oblong, acute, and 5 millimeters in length. The fruit is an ovoid capsule, 12 millimeters long, with a smooth, shiny, black seed. The seed is 6 millimeters long, and the fruit is 12 millimeters in diameter. The specific name is derived from the Greek words for "small" and "fruit."
1356. Inquest on accidental death. [Page 227.]

Comparative.-A. H. Lincoln, 19 years. Cause of death.-Injury to the head.

Section of brain examined by Dr. A. F. Lincoln, of the University of Michigan.

The brain was removed from the skull and placed in formaldehyde solution. It was then sliced into small pieces, and each piece was examined under the microscope.

The brain was found to be normal, with no evidence of injury or disease.

The sections showed a normal distribution of cells and fibers, with no abnormalities.

The entire brain was examined, and no abnormalities were found.

The cause of death was determined to be an accidental head injury, with no evidence of medical or surgical intervention.

Dr. Lincoln's report was presented to the coroner, and the cause of death was ruled accidental.
Genus Equisetites, Sternb., Vers. ii, pl. 43.

Stem fistulose, cylindrical, striate lengthwise, articulate, simple or branching at the sheathing articulation, sheaths attached under the articulations, erect, dentate.

Equisetites occidentalis, Sp. nov.

Pl. xx, fig. 5.

We have only one sheath of this species, the first trace of a true Equisetites found in the Coal Measures of this continent. The sheath is open or unfolded, somewhat broken in the middle, about three inches across, two inches long, regularly divided to about the middle by lanceolate, obtusely pointed teeth, marked by a strong nerve, which descends from the point of the teeth to the base of the sheath. The surface in the middle and between these nerves is irregularly wrinkled, and the base, in the line of connection with the stem, is marked by regular, half round notches, corresponding evidently with the striae of the stem.

The specimen is from Mazon creek, a concretion where this part of the plant is distinctly preserved. Another specimen from the same locality, but in a bad state of preservation, contains also fragments of an Equisetites, whose specific relation cannot be recognized. It has the remains of a stem about one inch in diameter, with a lacerate sheath.

Benedicta in cadamis em pa. 1838
Benedicta occidentalis. Sit thong for Dickinson, who is to
undertake the work. He desires the middle in regular lanceolate
form should be one inch and 1/16 of an inch wide.

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SELAGINÆ, Endl.

GENUS LYCOPODITES, Brgt.


LYCOPODITES ANNULARIFOLIUS, Sp. nov.

Pl. xxi, fig. 5.

Stem round, as seen in fig. 5 dichotomous, bearing opposite leaves, apparently united by two at the base, half embracing and slightly decurrent; leaves linear-lanceolate, obtusely pointed, slightly narrowed to the base, marked with a medial nerve, disappearing above the middle, open or slightly reflexed.

The mode of branching of this species, by a peculiar kind of dichotomy observable in some Lycopodiaceae of our time, the Ruedlie, for example, indicates the nature of this peculiar plant. It is not quite evident that the leaves are approached by pairs, and placed in two parallel rows or distichous; the specimen shows nothing more definite than what is represented by the figure.

No species of Lycopodites of the Coal Measures has been as yet published having leaves of the same form and type as ours; the only one somewhat comparable to it is Lycopodites macrophyllus, Gold. Flor. Saar., i, p. 12, pl. 1, fig. 5.

On a concretion from Mazon creek; in the cabinet of Prof. A. H. Worthen.

LYCOPODITES MEEKII, Sp. nov.

Pl. xxvi, fig. 6 and 6a.

Stem very slender, about one-sixth of an inch thick toward the base, dichotomous, with continuous, elongated branches, scarcely diminishing upwards; leaves imbricated all around, narrow, linear, lanceolate, acute, erect, or slightly open and curving upwards at the point. As seen, fig. 6a enlarged, these small leaves are thick, concave on the inside, sharply pointed, not enlarged, but semi-embracing at the base, and without trace of a nerve.
Acropelter Meekii, sync. Psende the specimen, in which the species is formed, July 2. It is a number of the same from Maine, which agree to belong to the species, is a little shorter in the carpus, and holds the leaves, in a flat and columnar. I do not know whether it is a new species, but it is the same, and perhaps may vary a little, in the common form. I cannot pronounce if it be the same as the species, which may be referred to this.

5. Sympodium Meekii, sync. Psende the specimen, in which the species is formed, June 13. It has the leaves of the same form, and the leaves of the same size. The plant is a little Sympodium, and the leaves are not divided enough to resemble the leaves of the same size. The plant has the leaves of the same size. I can only report that the leaves of the same size.

6. Calamodes chrysoides, syn. Psende the specimen, in which the species is formed, June 13. It is a little Sympodium, and the leaves of the same size. The plant is a little Sympodium, and the leaves of the same size. The plant has the leaves of the same size.
Astronomy, or since forms was very common and where there are not any bases of Equations in simple forms. Then from Carnot, when they appear common are also found in colors with the same asterophyll to our
Astronomy, long ago, and there is not yet any Equations remain
found. Then reference is therefore most likely. The form of the scales
however does not compare exactly with any of the figures of Aristotile and
German. nor with Genni astrophyll like others, which is the same as
Wallmanni, quadrata. Many new with Astrophyllite tabulated at Hall
all. with Mr. Polytechnic Tian K.' and V. Wallmanni. Major
quem, came did show some assemblage c. gaubus. Spi. B. de
found. He perhaps was in the same articulation regular, or form of scale
not different but one eye. The others with different articulation regular.
leaves, cell de German corresponding to more Astrophyllite to correspond
to German. This (2) See Blainville, (3) See Blainville, about this.
Astronomy, Chile, tab. 4. Two specimens from Mary-east, gold from Mary
1635 (1), 1635 (2) represent branches of the leaves. The broad leaf of Aster
is too and broad, from irregularly divided to nearly smooth, with each arti-
articulation 14 millimeter divided with opposite or right leaf, broad or
ear, diverging nearly in right angle. Narrow, three cent long, but becoming
Adobe with each articulation, his in number the axes is about 2 millimeter
broad, each articulation, articulation 3 millimeter, leaves a wheel of Iowa
narrow, pointed leaf, as the straight out from the articulation 1 right angle
then on curbed up, beanie in the and now onward to alternated articulation
in such a way that is separate upon the four. There are seen upon
the leaves articulation and on only upon that above in three or one of the
and only upon the other. They multiplied 1 1/2 millimeter and 3 3/4 millimeter.
The leaves at the articulation of three or three milli-long to not even half millimeter
wound and of the same length and until upon the articulation. The result
in upon the ear. This is exactly what I have published a theoretical
St. Thomas. it still as four to many phyllites. It has the same
character, a St. quadrata, differing much from the double large size
branch of 1635 had 4 millimeter round nearly at Chile and the ears were what
broader and longer and worse upon. Figure this three seconds second niche
1635. as four specimens present the St. Bitter from Chileans several for approximately
name Astrophyllite which has exactly the same characters as a St. quadrata (figure) from Chile
quarries, but which is cut into large in all part in the term specimen after
thus branching 2 3 with branches irregularly dichotomous. Able far with moth
nurture broad at the articulation, which are distinctly inflated”を得るがいぬの
or rather narrowed, moth with articulation my mouth in distance from the
10 millimeters. Fig 3 differs from much of branching as well as these
viewers, their long er branches with dichotomising, where in Fig. 2 they
are with short blade leaves.

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(1) By the injection of the articulation, and the 3 3/4 differ 1 1/2, 1 gros.

1820.
Upon the shell, or closely placed in small nodules to every fig 5 which are attached apparently to the leaflet the branches by a short curvilinear branch. In the first column the leaves are normal or longer and more distinct, 12 in the second. The second and third points, seemingly proved by the cuticulations and scars, are discernible.

At the edges of this leaf, the size of the annulars on the leaflet, the branches are really from the cuticulations and by the abscission of the others. They are not simple, and by comparison of growth appear like at distal form. The leaflet is only 1 in the male, the pulvini being 2 in the female. A leaflet is the furrow when another is flat. The leaves are much larger, the young being given the leaflet or modified by a stunt of younger stater. The young of this branch of 1 leaflet is 7 at length. The cuticles in the leaflet are not at first, nor are the leaflets.

1. Astrophytum foliis ovoideis. Seen in 1847. Proven 334 of Lawrence Brown Cobey, represent a Astrophytum with very close radial articulations or more than two millimetric caliper, with what I call narrow spaced leaves, these to epiglomer: long, no more than 3 millim. the divided shoot and near it. Right angle. The narrow stem, nearly half a cent broad and thinned to the leaflet, where a branch of its kind is curved with narrow leaflet. This is a particularly referable to its regular and the leaflet. With the leaflet, quite a crowd of leave the thickness very used. 3 centimeters long or more and spin made not more than an inch. The articulations are held by the leaflet. (2)

2. Calamostechis in subcylindrical, is represented by a large number of specimens, and now I believe on which date shall they be referable to the species. It is in subcylindrical, 15 cent. long. I have figured part of one. The leaflet, an entaunon of 1, smaller.

I have the figure a cilt section which I take with me. 1 see especially to figure 1, which is not the same a Calamostechis. Specimen 334 is a fragment of 1 anthophyllum stem scar 26 millim. width.

Equator to produce. Prior, see a leaflet, young or rather a small stem. It is a hulc with leaf long branches the leaflet. This specimen, however, the leaflet and 1 of the proximate ones. Comparatively my number G. W.;'s need is in most plating insufficient (1847).

Calamostechis is a new species of the same (3) variety. On one 2 millim. long, 14 cent. 7 to 8 punctum spaced when flattened, scales, appear on in 1 cm. 2 millim. distant, sitting above mainly narrowed at the base, ornament on in the whole length. We propose to doubt the reference of this to a Calamostechis. 16 puncta widely distant. 2 to 3 millim. long and 1 the length of three times. 5 the dimension for this species in its relation to Astrophytum foliis ovoideis.
There is evidently many species of the genus Calamocarpus, of which I have found the following three: Nos. 212 to 215 and 211 and 222, which appear to belong to the genus Ancistrococcum. I have also found two other species, which I shall not describe here. They are very similar in appearance to the species described above, but differ in some respects.

The fruit of Calamocarpus communis is about the size of a pea, and is covered with a thin, papery pericarp. The seeds are small and round, and are enclosed in the pericarp. The plants grow in swamps and marshes, and are common in wet places.

I have also found a species of Calamocarpus, which I have named Calamocarpus minor. This species is smaller than the others, and is characterized by a more slender stem and smaller leaves. The leaves are linear and taper to a point, and are borne in whorls of three. The flowers are small and yellow, and are borne in clusters at the tips of the branches. The fruit is small and round, and is enclosed in a thin pericarp.

This species is very common in swamps and marshes, and is easily recognized by its slender stem and small leaves. It is a small and delicate plant, and is a good addition to any collection of swamps and marshes.
FOSSIL PLANTS.

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This extremely fine and delicate Lycopodites may be compared to the upper branches of Lepidodendron selaginoides, Sternb., as figured by Jd. and Hutt., vol. 1, tab. 12; and also to Lycopodites Stichlerianus, Gopp., Silurian, p. 170, tab. 25. In our species the stem is longer, more slender; the leaves narrower and proportionally longer, and the ramification different.

On the roof shales of the coal at Morris.


Stems either single or branching, bearing on short alternate pedicels small cones or strobiles of an ovate truncate form, a compound of imbricate, broadly linear pointed scales, united at the base.

SCHUTZIA BRACTEATA, Sp. nov.

Pl. xxi, fig. 6 to 9.

Stem proportionally thick, smooth, bearing alternate short pedicelled cones or strobiles, about half an inch long, enlarged ovate from a narrow base, truncate at the top, slightly turned upwards, placed at the axil of a narrow linear bractlet, about one inch long and curved upwards. The cone is a compound of lanceolate pointed, concave scales, placed in spiral, closely imbricated and pressed upon one another, fig. 7 and 8; covering a transparent, yellowish membrane, formed of small, elongated, equilateral meshes; fig. 9, which enclose or support small granules of opaque, brown matter. These granules, scarcely the one-hundredth part of a millimeter in diameter, are of a roundish, irregular, polygonal form, agglomerated and separating with difficulty. Their size and irregularity of form prevent considering them as spores; they look rather like grains of pollen.

From the great difference in the form of the buds born on the stem, which cannot be accounted for, I think, by difference in maturity, it would appear as if the scape of this plant was bearing monocious flowers, the ones in strobiles bearing pollen, the other fertile buds. These, as seen in a, fig. 6, have the appearance of an inflated receptacle, either naked or bordered at its top by foliaceous, narrow divisions. Two specimens of this plant have been found in the
concretions of Mazon creek, and both present the same appearance. Some plants resembling ours have been described under the generic name of Antholithes. But this genus is still indefinite, and the plants referred to it really unknown. I have, therefore, placed this species for description in this new genus of Goppert, as more related to it by some of its characters.

Genus Lepidodendron, Sternb.


The species of this genus, as it is well known, are characterized merely by the form of the cicatrices, which have been left by the base of the leaves upon the bark of the trees or of their branches. These cicatrices or bolster vary indeed in size and also in their relative position, according to the thickness of the different parts of a tree, where they are examined. But this variety is far from being as marked as some authors, who have attempted to reduce the species to two or three, seem to suppose it. In following the course of the development of these scars on long stems of Lepidodendron, from parts measuring at least one foot in diameter to the smallest branches, they may be seen to vary in size and position according to the degree of activity of the vegetation at different times, and also on account of some irregular mode of growth; but their essential characters, viz.: their outline, the position of the vascular points, as also the form of the leaf scars surrounding them, is generally preserved and recognizable in the whole length of the stem. It is argued that for the genus Lepidodendron, we should have too large a number of species if we would consider the scars as specific characters. But the genus Sigillaria, so admirably studied by Prof. Brongniart, and after him by the most careful Palaeontologists, especially by Goldenberg, whose acuteness of observation is beyond question, has a number of acknowledged species, at least double of those of the genus Lepidodendron. Goldenberg describes sixty-seven species of Sigillaria! and yet the specific characters are taken from the same vegetable organs, or from the cicatrices of the bark, which are certainly as much subject to variations in Sigillaria as in Lepidodendron. Why, then, deny the value of the species of one genus, and admit the reality of those of the other. The most marked species of Lepidodendron of our American coal fields, L. modulatum, L. giganteum, L. clypeatum, L. vestitum, L. distans, published in the Geological Report of Penna., have been found over the whole extent of our Coal Measures, and are recognized everywhere by their distinct characters from the form of their cicatrices. In collecting specimens on shale, for the State Cabinet, great care has been taken in comparing the largest possible number of specimens of the same species at the same place, not only to obtain the different
1. *Leptodendron thomsonii* var. We have a large number of small specimens, most of which referable to this species or one of the two species described & placed in the **Leptodendron** genus. In the Herb. 246 (2) of 1879, Brueich, named a variety, but which apparently is the same. A branchlet, bearing many leaves, instead of one, but with a* 

2. *Leptodendron thomsonii* var. This is one of the most interesting of the group. The leaves are much smaller and narrower than in the species. The leaf base appears to be almost square, with a sharp angle at the base, and the leaf margin is entire, except at the base, where it is somewhat wavy. There is a distinct groove along the midrib, and the leaf is more or less pubescent on the underside. The flowers are small, with five petals, and the fruit is a small brown capsule. It is a very small tree, with a short trunk and branches. The bark is thin and somewhat scaly. The leaves are arranged in opposite pairs along the branches. The flowers are produced in May or June, and the fruit matures in August or September. The tree is native to the Pacific coast of North America, from California to British Columbia. It is a very hardy tree, and is often grown in the gardens of the Pacific coast.
Repudiation of Musidian and the Specimen in the Museum. See pp. 775-776. The species is a monotypic one distinguished by its distinctively conical shape and the presence of a large, conical, beak-like structure at the apex. The specimen, which is housed in the Museum, is the only known example of the species. Its form and structure are typical of the family, and it exhibits the characteristic features of the genus. The species is named and described in the text, and the specimen is illustrated in the figures.
21. Aspidodendron, description given from Bentegay, p. 178, 1818. Fig. 8, p. 16 of the same. This 21. specimen is in the possession of the New York Botanical Garden, and is similar in form to the specimen which I received from Mr. Bentegay. The New York Botanical Garden has a specimen of Aspidodendron which has come from the name of Aspidodendron. L. K. 1.

22. Aspidodendron, description given from Bentegay, p. 179, 1818. Fig. 9, p. 16 of the same. This 22. specimen is in the possession of the New York Botanical Garden, and is similar in form to the specimen which I received from Mr. Bentegay. The New York Botanical Garden has a specimen of Aspidodendron which has come from the name of Aspidodendron. L. K. 1.

23. Aspidodendron, description given from Bentegay, p. 179, 1818. Fig. 10, p. 16 of the same. This 23. specimen is in the possession of the New York Botanical Garden, and is similar in form to the specimen which I received from Mr. Bentegay. The New York Botanical Garden has a specimen of Aspidodendron which has come from the name of Aspidodendron. L. K. 1.

24. Aspidodendron, description given from Bentegay, p. 179, 1818. Fig. 11, p. 16 of the same. This 24. specimen is in the possession of the New York Botanical Garden, and is similar in form to the specimen which I received from Mr. Bentegay. The New York Botanical Garden has a specimen of Aspidodendron which has come from the name of Aspidodendron. L. K. 1.

25. Aspidodendron, description given from Bentegay, p. 179, 1818. Fig. 12, p. 16 of the same. This 25. specimen is in the possession of the New York Botanical Garden, and is similar in form to the specimen which I received from Mr. Bentegay. The New York Botanical Garden has a specimen of Aspidodendron which has come from the name of Aspidodendron. L. K. 1.

26. Aspidodendron, description given from Bentegay, p. 179, 1818. Fig. 13, p. 16 of the same. This 26. specimen is in the possession of the New York Botanical Garden, and is similar in form to the specimen which I received from Mr. Bentegay. The New York Botanical Garden has a specimen of Aspidodendron which has come from the name of Aspidodendron. L. K. 1.
Leptodendron Linn. a creeping tree (repose) of Leptodendron. It is 1640
should be described as possible.

Leptodendron (Luzernia) Procarnivorum, so is Lepotized Volckman in
as figured by Sibth. III. VII. & II vol. 11. is apparently represented upon small
fruits from Major Crutt. 1662. It agrees also with the third description
given of Leptodendron by Prince but not in p. 233. Having the
area simple, chambered, not terminal and the creeper plants
are not surrounded by a round border. It is also somewhat like
L. Turbinatum of the 11th of May. I conclude is a new race.

Leptodendron Stenleyi: L. luzernia, given Mr. 29s flat leafed
branch with an internal flattened round is pricked on both side by
creatures. Like those of Stenleyi more elongated in point of the
branch than the others, all covered with a thick coating of only one
way, some others mostly covered. These as fingers 12th or even
just held the vascular band. It is the word in whose case the plant
spontaneously given rise to by an elongated bud. 12th this. The plant is covered, even
from the middle. IPer of the small
frass to the flat, or pricked, appeared.

Leptodendron Delight of fuller 29s flat leafed Stenleyi, in the
union of the flat leaf. The other side has a tubular leaf, not flat, and not round on either side, as in the
Stenley. The plant is covered, even
down the middle, and the middle. It is marked a small
branch to the flat, or pricked, appeared.
parts of a plant, but also to carefully note the variations of the same plant under different circumstances. In this way it has been possible to ascertain the reliability of some doubtful species of *Lepidodendron*, and to unite in one some parts formerly referred to different species or even to different genera.

**Lepidodendron rigens**, Sp. nov.

Pl. xxvii, fig. 1 to 3.

The concretions of Mazon creek, which have generally preserved plants or their parts in their integrity, without deforming them by compression, have furnished, among other very interesting specimens, the branch of *Lepidodendron* which is copied in our figure. It shows distinctly the bolster, the point, and mode of attachment of the leaves, around the leaf scars, and the vascular vessels, or bundles, in their disposition in passing from the stem to the leaves, as in fig. 2. At the same time it proves that, in some species at least, the leaves of *Lepidodendron* were inflated, or somewhat cylindrical in their whole length, as marked in fig. 3, and not flat, as they are generally seen on the shales. These leaves were not hollow or tubulose; they are too stiff for that in this species at least, but were probably filled by cellular tissue traversed by three bundles of vessels. The form of these leaves does not appear to be exactly like the outline of the leaf scar, as they seem to extend and become flat on the sides in joining the scar, fig. 2, and in the cross section, fig. 3, enlarged, the leaf does not indicate any angular compression on the sides. The bolster of this branch have not yet their definite form, and therefore the specific affinity, considered from these characters, can not be satisfactorily recognized. The narrower leaves and cicatrices distinguish it evidently from the following species, which it resembles by the length and straightness of the leaves.
LEPIDODENDRON MORRISIANUM, SP. NOV.

Pl. xxii, fig. 1 and 2.

The cicatrices of this species are of three kinds. Under the surface or true cortex, they appear slightly upraised, like those of a Knorria, upon a short pedicel which is enlarged downwards, rough on the sides, with a flat rhomboidal top or leaf scar, marked like that of the surface by three vascular points, fig. 1a. The surface cicatrices are broadly rhomboidal, with the opposite sides nearly parallel, curved outside and the leaf scar placed near the top, rhomboidal obtuse above and below, acute on the sides and marked by three horizontal large vascular points. The medial line of the bolsters is merely indicated by two or three horizontal wrinkles, enlarged in the middle. These cicatrices of the surface, when covered with the base of the leaves and their coat of coaly matter, appear hexagonal, fig. 1b. The leaves one foot long or more, one and a half inch broad when flattened, are sharply marked by three vascular lines and narrowly, regularly striate on their surface, formed of a pellicle of coaly matter as thick as a leaf of paper, fig. 2 enlarged.

The tubular form of the leaves of some Lepidodendra is visibly marked in this species, for it is only by considering them in that way, that we can account for the difference remarked in the relative position of the vascular bundles when the leaves are flattened, for they appear on our specimen either central or lateral or single, double, triple, according to the plan in which leaves have been compressed. This fine specimen from the roof shale of the coal of Morris was communicated by Mr. J. Even. It now belongs to the State cabinet.


Pl. xv, fig. 1.

In the shales at Morris, by Mr. S. S. Strong. It distinctly preserves its characters, though the cicatrices are small. Found, also, in concretions at Mazon creek.
Leptodexdria. modulation tos, as was at re- (6) intermediate between
its aculation, & & J. Stenius. By which & elaboration of uniform
and in the LXVIII 1 & styly, by its longer more prolonged creates
beautified up and down in a long curred curred tail. To this it
is much & & aculation (from which it differs by the pulvini
flap down of reason to the middle, the constant base which pursures
the roof. The different form of the pulvini. As in the species the coch,
only is then, distinctly, deeply and regularly, quote in the length, the
lines being parallel, half a millimeter distant. The tufts in however
may sometimes, narrow, but the curved base and to
and the pulvini are constant characters since 1302.

Leptodexdria. simplis. 9 days. A few small specimens, 1589, from
from North Coast, from a squint creatures 15 mill long, 4 mill broad
in the middle, where they are broadest, with a. pulviniects exactly
thumbed & obtener the few curious, consistently large placed in the
middle of the creatures, with how the base part flat, not curred-
and a new trace of depressed tufts pursued for the tufts. The vacuole
point are-in the middle of the pulvini, three deep, the middle
are a little trace or some had sterile appendages none. The pul-
venome 'Middle is one and one half millimeter each way between the
corners. They usually measure or could covering the base creature is
comparably. Three. And in the former species, and fully
smooth and polished. The tufts are separated by a double border
with a groove in the middle. One to one and one half mill meter
broad. The pulse, much nuible. L. Simples of the 2nd of the
A. 41 and appear generally different from A. villosus, as
19.6 Grinly. Though the different relation is great. The tuft in one
flat not curred the central pulvini, is obtuse at the branch
of an equivalent shanb. Another specimen of 1595 which is apparently
referable to the same species has the tufts neither broad nor broadened.
And expanded narrow border or has then expanded & collected
ar, in order of the whole. The species 1589. In this also (1593) the
central pulvini is enlarged on both sides, which are curred, while
the upper and lower one are rounded of the vacuole point are however
in the middle and thus in, where of appendage and no appendages.
The species is in the other species are shorter and broader than in L. simples. However, I think in the same species. The key
are narrower though not as narrow as L. simples content as well
and the lateral more the same kind of Pulvinaria. Have seen also this near
of the same species the record of 1589 & 1591 of Shaug (1814-1). One of
There has the holobites separated by flat borders with ridge above.

The pubescent are of the same form as new species of this group with
vascular points. The radicles are three centimeters long
and eleven millimeters broad. The other species has the holobites with
three centimeters long and fifteen millimeters broad with the peduncle much larger
and more deeply marked. The holobites separated by a
narrow, narrow, sharp and deep edge. The middle of the peduncle
in undulate, reflexed in the length.

1. Agathodesmus modulatus de la Perière. No. 365 in a firm branch.
39 centimeters long, 34 centimeters with scar, 50 centimeters long. The
characters indicated by the species. The peduncle has a ridge on either
side, more borders on the flat, more borders than in the flat, but distinguished by both
parts. When the species are flattened and enlarged the original
holobites remain well enough. 30 centimeters long. 40 centimeters
wide. Each with flat and rounded borders. Acaliae, acupis, the same
specimen.
comparing my figure with the many species, I find it somewhat like that of Apodocodon-Meltemanus as figured in Wood.-I, PI. VIII, fig. 4 A-1. Difficulties arise here in the shape of the lobes, somewhat larger, rumpled above and below the vascular cicatrices and separate by a flat broad margin of small groups. These all the same, there is no trace of rumple, or rumpled cavity either below or above the vascular cicatrices. The reference of this species is therefore uncertain between L. nulentus and L. Meltemanus.

1 Apodocodon Meltemanus. I have figured a figure of two very similar species of the genus, Lacocephalus, in PI. XI, fig. 1. & 3. The lobes are very prominent in the former and deeply punctured. The top of the lobe is the clear, predominant or deeply punctured, the top of the lobe is the clear, predominant or deeply punctured, the top of the lobe is the clear, predominant or deeply punctured, the top of the lobe is the clear, predominant or deeply punctured, the top of the lobe is the clear, predominant or deeply punctured, the top of the lobe is the clear, predominant or deeply punctured, the top of the lobe is the clear, predominant or deeply punctured. These two species are closely related and at the base of the lobes, more rumpled, on the three vascular cicatrices and at the base of the lobes, more rumpled, on the three vascular cicatrices and at the base of the lobes, more rumpled, on the three vascular cicatrices and at the base of the lobes, more rumpled, on the three vascular cicatrices and at the base of the lobes, more rumpled, on the three vascular cicatrices and at the base of the lobes, more rumpled, on the three vascular cicatrices and at the base of the lobes, more rumpled, on the three vascular cicatrices and at the base of the lobes, more rumpled. They evidently represent the species like those mentioned above, with the same characters. Another species in the same figure, from North Borneo, is very similar to this species by the work of Dr. Bringelen, PI. VIII, fig. 2. The lobe is being only a little larger than the lobe of the species. It is also comparable to the species of L. commutatatus and L. Temnoderus, both of which are also referable to this group. In the figures of the species mentioned above, the lobe is being only a little larger than the lobe of the species. It is also comparable to the species of L. commutatatus and L. Temnoderus, both of which are also referable to this group.
Lepidodendron forulatum, Sp. nov.

Pl. xxiii, fig. 5 to 8.

Cicatrices distant, oval, narrower and pointed at both ends, wrinkled across; leaf scar large, central, marked with three distinct large vascular points, without medial line or appendages; corticated surface deeply undulate-wrinkled lengthwise, marked by deep, narrow, equally distant furrows, separating the cicatrices in vertical rows as in the genus Sigillaria. The decorticated surface, fig. 7 and 8, is regularly striate lengthwise by narrow, nearly straight wrinkles, and has its cicatrices upraised or convex-rhomboidal, split from the central point downwards, by a deep narrow line.

The peculiar furrowing of the surface of this species does not appear merely casual. A disposition of this kind has already been observed, though not quite as distinctly marked, in Lepidodendron costatum, Lesq., described and figured in the second volume of this Report.

Found at St. Johns, in the roof shales of the main coal.

Lepidodendron Tijou. Sp. nov.

Pl. xxiv, fig. 1 to 3.

Cicatrices of the cortex proportionally small, ovate, long pointed at both ends, separated by a flat irregularly wrinkled border, about one line broad; leaf scar large, placed above the middle, smooth, marked by its three vascular points, without medial line or appendages; cicatrices of the decorticated surface of the same form, smooth, merely marked in the middle by a vertical line, fig. 3, (36 enlarged). A small piece, fig. 2, of the same, though taken from the largest part of the tree, preserves the form and distance of the cicatrices as in the specimen of fig. 1. The coat of coaly matter covering the surface is thin, smooth, and the place of the leaf scars is hardly indicated on it.
The specimens of this species were found in connection with the *Lepidodendron* and its *Lepidophyllum*, as seen in fig. 1, in the roof shales of the main coal of St. Johns. Dedicated to Mr. Thos. Tijou, superintendent of the coal mining company, Duquoin.

**Lepidodendron mammillatum, Sp. nov.**

Pl. xxv, fig. 1.

General cicatrices marked obscurely by an irregular narrow furrow, obtuse at the upper end, narrowed downwards into a caudate curved point, central scar round, mammillate or convex, notched at the top, or with irregularly undulate borders. The specimen represents the decorticated part of the species, and does not indicate any trace of leaf scar or of vascular points. The surface is deeply and irregularly grooved, the grooves passing in undulations between the cicatrices.

Found in large specimens on the roof shales of the coal at Morris.

From specimens obtained two late for the plate, the species shows the character of a true *Lepidodendron*. The cicatrices are broadly oval, pointed at both ends, the leaf scar is of an oval form, enlarged on the sides or horizontally marked with a large medial vascular point and two lateral ones, placed at the corner of the leaf scar under which is an oval convex bolster. This bolster is the only part left of the specimens where the surface is old or eroded, as seen in our figure.

**Lepidodendron cruciatum, Sp. nov.**

Pl. xxv, fig. 2.

Surface furrowed by deep, irregular grooves, diverging from the scars in quincunxial direction; cicatrices distant, deeply cut in the shale, but irregular and variable, generally oval and narrowed downwards. The supercortical layer of coaly matter is very thick, one line at least, deeply, narrowly and regularly striate, filling the depressions or hollow scars, and obliterating their forms.

The specimen from which the figure is copied, is large, and apparently represents the base of a tree whose bark has become roughened by age. The species is uncertain and not satisfactorily known.

Roof shales of the coal at Morris.
Dependence crurium vs. The Fig is a fine belle specimen. It should be shown. The lobules are not elongated masses near the top with a round base and a central vascular core. Some of the lobules seem to have the same lungs, some like those of the liver. The gynoecium should be studied and found in a better state of preservation, if possible. See if this was not published in Wordsworth's pamphlet.
The present paper is divided into two parts. The first part deals with the general properties of the disease. It shows that the disease is caused by a virus and not by a bacterium. It also shows that the disease is transmitted by contact and not by the air. The second part deals with the treatment of the disease. It shows that the disease can be cured by the use of certain drugs. The paper is based on a large amount of experimental work, and it is supported by the results of many clinical trials.
Lepidodendron? Greenii, Sp. nov.

Pl. xxvii, fig. 7 and 8.

Cicatrices distant and deeply marked, oval in outline, pointed at the top, rounded at the base, marked under the point by a round, deeply sunk leaf scar, bordered by an upraised ring, and marked by a single central vascular point, thus resembling the scar of Syrigodendron.

From the great distance of the cicatrices, which are placed in a quincunxial order, and from the form of the leaf scars, it is presumable that this species may belong to another genus, or that it is the type of a new one.

Found by Mr. H. A. Green, in Mercer Co., Ills.

Lepidodendron rugosum, Br gt. Brod., p. 85. = f. Sternb. Little Vermillion; Dr. J. C. Winslow.

Lepidodendron gracile, Br gt.

Veg. foss., 2, t. 15?

Lepidodendron elegans, Br gt.

Veg. foss., 2, t. 14?

In the roof shales of the coal of Morris and of Colchester, there is an abundance of small stems or branches of a Lepidodendron covered with short, linear, lanceolate-pointed, flat leaves, referable, from the figures given by the author, to the above-named species. These are considered by more recent authors as identical with Lepidodendron abovatum, Sternb., the form of the cicatrices being alike, and differing merely in size. Lepidodendron abovatum is also found at Morris and Colchester with large cicatrices.
Genus ULODENDRON, Rhode.

Stem arborescent, simple, covered with rhomboidal cicatrices, remains of deciduous, strobile-like branches, densely covered with imbricate leaves.

This description, translated from Unger's Genera, p. 262, does not give a clear idea of the form and nature of the trees referable to this genus, for the good reason that now, after years of research among the remains of fossil plants, these species are known to us by mere detached fragments, whose relation is uncertain. Prof. Brongniart has considered this genus as merely representing species of Lepidodendron, and this opinion has been more or less generally admitted by others. And truly, the bark of the trees or of the species referred to this genus, bear cicatrices or bolsters generally of the same type as those of the true Lepidodendron, with also the leaf scars and vascular points of the same kind and placed in the same position.

They differ essentially in this: that they have two or more parallel rows of large round or oval scars, which appear as if they had been made by the base of large strobiles or cones, thickly covered with scales or short leaves. These organs have not yet been found in connection with trunks or branches, and therefore their origin is hypothetical. They have been considered either as the cicatrices of a peculiar kind of leaves, a supposition which is not admissible, or as the scars of lateral abortive or adventive branches, a supposition also unsustainable for vegetables regularly dichotomous, like those of the genus Lepidodendron, or as the scars of large strobiles like those of our Lepidostrobus princeps, (this Report, vol. ii, pl. 45, fig. 1) whose size corresponds with that of the cicatrices, and prevents the idea that they may be borne at the top of the slender branches of Lepidodendron.

I consider this last supposition as the right one. These scars, one or two inches in diameter, are placed in parallel rows, alternate or opposite to each other, at a distance varying vertically from two to eight inches. It is possible that these organs were borne on peculiar fruit-bearing branches of species of Lepidodendron. The horizontal distance between them is not great: 2 to 3 inches. What seems also to indicate branches is the small size of the cicatrices of the bark, which in all our specimens is about the same. There is, nevertheless, a peculiar character remarked on the specimens of all our American species, which is not observable on the bark of species of Lepidodendron. Their surface is ribbed lengthwise by irregular ridges, from one-fourth to one-half of an inch broad, one to two lines thick, generally angular at the top, bearing be-
I have arranged the specimens of the museum according to my descriptions in the first. It is possible that the **Medendorum** elongation could be the same species as **Plecta** var. in the young. It is equally referred to its base both of the lower leaf being contiguous and same of the Osmanthus. But I shall think its elongation was the same as Osmanthus **A. S.**

**Medendorum** var. **H. Mill.** Refer to this species, a fine small specimen 1377 which has a bag, exactly well defined consisting of the leaves. **Plectra** var. 16 millim. wide, and length of 11 cent. leaf blade, about 11 millim. long. The leaf scar is not contiguous, some quite contiguous, some half a centim. distant, exactly round, 23 millim. Both scar. The characters of the scar of various or described figures. It has 5 or 6 scar on one side and 5 or the other. So far so. I have no further rest.

I have another from **H. Affari**, which is perhaps a fragment of the same but of a larger plant, the scar, 10 cent long, 15 cent. wide, flattened to a thickness of 5 cent. The scar are nearly contiguous, some quite contiguous, some half a centim. distant, exactly round, 23 millim. Both scar. The characters of the scar of various or described figures. It has 5 or 6 scar on one side and 5 or the other. So far so. I have no further rest.

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...developed and a close examination of the disk reveals the fact that the outer horn of the borders were underradiated. All the characters being tenuous, the impression of disks of cats or sea in some Ulodendron. The leaf was at the horn exactly those of the margin of the disk, but the characters being tenuous, the node of a new radiate, with an oral, nearly round, or around, a single central vessel, was just as marked in this disk. At the fig. 11. I consider this a perfectly central umbilicate, Ulodendron may, etc. best in the young leaf. It is necessary to consider the leaves, not the leaves, of Ulodendron to the simple species of Ulodendron could still more difficult to admit the regular branch of these branches in the vertical without upon the bundles. This however not more difficult to understand than is the same position for each of the leaves, and I must say that most of the disks which I have had the opportunity to examine in large numbers, have the surface covered by irregularly disposed rays that may exhibit a single well-defined group of rays disfigured by age and compactness, lamellae of scales. The question of these Ulodendrons is however not clear to the presence of buds of branches exactly represented at the knees upon the branches and at the tips of the structures where the disk blurs somewhat and is apparently stopped in a new indiction by a number of their adventitious buds, which terminate it. The species in Ulodendron into Carasellinae. It is quite distinct in all its features. It should be difficult to convert the fragment of a young creeping stem. The flowering form seems to indicate it. Observation may have been on the principle of the carboniferous. The Thaum of the leaves, here of the branch, and it may be that many of the sphenodiaceae, species which are represented in the leaves, are erect or on the contrary being ruled or floating by stem. This might explain the function of the dormant for those penicillae of the branches of Ulodendron. It is noteworthy, however, that the similar Ulodendron all around a stem and the fragment of creeping chlor. I have seen Ulodendron at the bases with scars on both sides of the stem.
1. **Modernia major** De Cand. & T. Herb. var. from Monteaval. Some specimens referable to this species. The stalk is branchless, straight, nearly round, not quite three cent. distant, 4½ cent. long and 14 cent. broad, irregularly marked by commissural veins and the margins of the leaflets, slightly revolute and also slightly umbonate in the middle. The leaflets have, as in the surface coating of coal 10 to 15 mm. wide, but one leaflet of the middle, 8½ cent. long, 5½ cent. broad, the lower surface cornified with the margin, the coating of coal 2½ cent. thick, as in the former species, circular, and rhomboidal elliptic, crenulate at both ends, more prominent and more obtuse than on the other leaflets. The middle, 15 cent. long, 10 cent. broad, the lower surface slightly crenulate, the tip and a regular point in the middle, dark green, large, pointed oval, 2½ cent. longer than broad. The centimeter is long, 2½ cent. and an half 2½ cent. broad, and marked easterly by the impression of the leaflet. The leaflets are very prominent, more than upon the surface of the leaf, and comprises numerous. The leaflets are not prominent, and not the best species of the leaflets. The distance between the leaflets is greater than 1½ cent. and less than 2½ cent. In a small space more than the one, the leaf is about 2½ cent. long, the distance between the leaflets is 4½ cent. long. 2. **Modernia exigua** De Cand. & T. Herb. var. from Monteaval. Few slender and flexuous, 2½ mill. diameter dichotomous, dense round, 8½ cent. diam. and closely set into the stone by impressions of half globular convex, ½ to 5½ mill. High upon the stem of which the impressions are preserved into the coal (wood) comprising distant, three to four and an half, and distant from 1 to 5½ cent. convex or without regular point in the middle, and the middle, 2½ cent. long, and 1½ cent. broad, with 3½ mill. and an impression of scale, towards the base, all the 3½ cent. convex. The leaflets are marked in the middle and small dichotomous, branches in a, more or less.
tween them flattened furrows, or strips of true bark with its cicatrices. The irregularity of these ridges, which vary in size as well as in their respective distances, being sometimes close to each other, sometimes a few inches apart, contradict the supposition that they are a kind of organism resulting from the normal growth of the trees. They are mere excrescences, similar to those which are seen on old trees; for in some places, by the expansion of their borders they cover part of the scars, in some others they push them aside, as from the enlarging border of a split. When supercorticated, the surface of the species of this genus between the top of the ribs, is filled by a coat of carbonaceous matter, half a line to one line or more in thickness, in such a way that the surface of the coat of coal is on a plane with the ridges, and that consequently, the coal is thicker in proportion to the depth of the grooves, as seen, pl. xxiii, fig. 1.

The surface of this coaly matter is smooth, striate lengthwise by narrow parallel lines, and the position of the cicatrices of the bark and of the leaf scars is merely indicated by a slight depression, with a point in the middle. The peculiar nature, or rather the mode of formation of this supercortical coat of coal, which covers the surface of the plants now examined, as also of most of the species of trees found in the shales and in the sandstone of the Coal Measures, is not explained. It is evident from what is seen on our specimens, that it does not represent a true cortex, but that it is rather produced by some exudation of matter (ulmic acid?) forced, by compression, during the process of maceration and carbonization of the plants. This supposition, however, does not account for the peculiar marks left and defined upon the surface of this matter, and different in each species.

**Uloidendron majus, Ll. and Hutt.**

_Foss. floras_, l, p. 22, t. s.

_Sigillaria Menardi, Lesq._

_Ill. Geol. Rep., vol. ii, p. 450, Pl. 48._

Large and numerous specimens of this species, obtained from the shales at Morris, have afforded opportunity of studying it under various appearances, and of recognizing its identity with the species described and figured by Lindley and by Sternberg. Though the cicatrices are most of the time obliterated, and their outline modified, some specimens present them in their primitive forms, with the essential characters, the three-pointed leaf scar of the genus _Lepidodendron._

They are rhomboidal in outline, pointed or truncate at the top, rounded at the base, enlarged on the obtusely pointed sides, marked in the middle by a
slightly inflated bolster, and topped by a small rhomboidal leaf scar, marked with three vascular points. The details characterizing this species, and which have not been given by the authors, are represented in our plate 22, fig. 4. The outline of the cicatrices differs indeed from that of the known species of *Lepidodendron*, and when the surface is somewhat erased, as in the part represented fig. 4b, and as is generally the case on specimens of this species, it is indistinguishable from that of *Sigillaria Menardi*, Brgt.

In its decorticated state the species equally preserves the appearance of *Sigillaria*, its wrinkled surface being marked by mere semilunar, inflated dots, as seen in fig. 4. The strobile scars are proportionally large, approximated to each other, alternating in two vertical rows, nearly exactly round, or rather enlarged horizontally.

Mr. Jos. Even, of Morris, has kindly sent photographic plates of large specimens of his, which bear these strobile scars, one and a-half inches in diameter, at a horizontal distance of three inches, and only one and a-half inches from each other in vertical direction: The vertical distance of these scars is apparently variable; it is, however, generally shorter in this species than in the following ones.

On stiales at Morris and Colchester.

**Ulodendron ellipticum**, Sternb.

Pl. xxii, fig. 3, and Pl. xxiii, fig. 1 to 3.

Under the name of *Lepidodendron ornatissimum*, Prof. Brongniart has represented in his Foss. Flor., vol. 2, pl. 18, a large specimen of this species. As there is not as yet a detailed description of it, and as the cicatrices of the surface are not as clearly defined on the European specimens as on ours, I have figured the essential parts of this species as exemplifications of its general appearance.

The surface cicatrices are almost exactly rhomboidal, angular on the sides, slightly elongated, more or less distant, with the leaf scar nearly central, marked in the middle by a depression or small hollow, as indicating the place of a single vascular scar. These scars are not indicated by any of the European authors. It is probable that the two lateral ones are obliterated, but, although a great number of specimens were carefully examined, they could not be detected on any one of them. Pl. 23, fig. 3 enlarged, shows the details of the forms of these cicatrices.

The strobile scars on this species are opposite to each other, vertically more distant than in the former, or four to six inches, and horizontally six inches.
4. **Ulodendron ellipticum.** I have seen at J.D. [J.D. = John Dyer, botanist] of twelve or thirteen specimens of this tree with branches distant about or horizontally twenty cent meters. The same distance is measured upon another from Holton, vertically; this last specimen is a narrow and has only one row of branches.

transverse sections: 1. 5. 300 X 300. These large branches present a central trunk... hill. The branches of this... to the right, which is inflexed and obliquely inclined by a slight curve, and then the centre of the group of branches

**Ulodendron majus.** Dr. Hull, No. 651 [Hull = John Dyer, botanist] of twelve or thirteen specimens of this tree with branches distant... right, which is inflexed and obliquely inclined by a slight curve, and then the centre of the group of branches

**Ulodendron Kunzei.** Ki. A specimen of twelve... branches distant about or horizontally twenty cent meters. The same distance is measured upon another from Holton, vertically; this last specimen is a narrow and has only one row of branches.
1. *Ulododrilus elongatum*. I have seen at 53, twenty, more, a very fine species, 39 cent. broad and 1 meter long, with very flattened, bearing opposite round or nearly circular lobes, eleven in each side, comparatively small at least considering the size of the specimen. The leaf vein in this and all the specimen which I have seen and have obtained an exact fit and are separated by a double border a figure 2 and described here. Another specimen of the same species has the lobes 6½ cent. long and 3 cent. broad. Of the species which I looked upon from them, except eight plant meters long and four to five cent. broad. The form of the lobes is therefore very variable. While the characters of this species are permanent. In both these specimens which apparently belong to an older and large, the leaf veins are less than on cent. long and nearly half as broad in the middle. The leafy covering of the species is thick, at least one millimeter. The distance (vertical) between the lobes in old live is twenty one cent. with lobes 5 ½ cent. long and 4 cent. wide.

2. *Ulododrilus elongatum*. The distance between the lobes in this species is some times very great as I have seen at thirty, twenty and on meters square with many lobes. It is always deeply irregular, neither is seen.

3. *Ulododrilus elongatum*. I am 25, this specimen of a worm surface about 10 cent. meters being covered with the calceus, which renders this character superior. The middle of this worm has an oral cavity very thin and half cent. long, about twice the length of the calceus which connects with the ramus of the canal through it is exactly half the of an *Ulododrilus*. It is also appear conical and the winding of the heart has been flattened by and no, surface the whole is not distinctly determinate,
FOSSIL PLANTS.

On the largest of my specimens, the scars are two and a-half inches long and one-and-three-fourth inches broad. Some of these scars are distinctly marked by the cicatrices of the surface nearly to the middle, or just to the point of attachment of the strobile, which has only one-third of an inch diameter. This clearly indicates that the growth of the leaves was stopped around the pedicel of the cones by the compression of their open scales, and that the cone itself was attached to the tree by a pedicel as small as is generally the central axis of a Lepidostrobus.

Collected in splendid specimens from Morris, by Mr. S. S. Strong.

ULODENDRON ELONGATUM, Sp. nov.

Pl. xxiii, fig. 4.

The cicatrices of the surface are in this species about of the same form as those of Lepidodendron rimosum, Stern., or of Lepidodendron simplex, Leseq., as represented vol. 2, pl. 45, fig. 5, of this Report. They differ only by a narrow, elevated round border, which, as they are slightly apart from each other, leaves between them a narrow smooth furrow. The leaf scar is nearly central, as marked on the figure, and shows the three vascular points of a Lepidodendron. The strobile-scars are proportionally longer and narrower than in the former species, nearly twice as long as broad, vertically distant eight inches or more.

As I have not seen any specimens with double rows of these scars, I do not know at what distance they are placed horizontally, and whether they are alternate or opposite. From the form of its cicatrices, this species might be identical with our Lepidodendron simplex, and the strobile scars represent the base of a cone like Lepidostrobus princeps, Leseq., loc. cit. Both species also may be referable to Lepidodendron rimosum, Sternb., and Lepidostrobus variabilis, Ll., and Hutt., which Prof. Geinitz, in his Verst., p. 35, describes as the same. It is only remarkable that this celebrated author persists in considering these enormous cones as sustained at the end of small branches which, according to his description, are only one-third of an inch in thickness, and that he admits the roundsears of cones as mere branch scars. He has only figured one of them, however, in his tab. 3, fig. 16. It appears to represent the three different forms of Ulodendron majus, under the name of Halonia punctata, Ll.

Tab. 45, fig. 1, a-e.

I refer to this species, though with some doubt, a beautiful and well preserved specimen, lately communicated by Mr. John Collet, from the Mahoning sandstone? of Clinton, Vermilion county, Ind., near the limits of the State of Illinois. The specimen represents a branch compressed into an oval shape and slightly arched, three and three-fourths inches broad across in its broadest diameter, two and a-half inches in the narrowest compressed part, its upper cortex marked by small, oval, convex-pointed intumescences, with a small oval, deeply concave scar at the point, placed in spiral at about one line distance from each other. The upper cortex is formed by a pellicle of ferruginous, semi-carbonaceous hard matter, no thicker than a quarter of a line. Under it the surface is marked with the same kind of cicatrices, but the top oval scars are obliterated. On both sides of the branches there are two longitudinal rows of strobile scars, one and a-half inches distant from each other, a little less than one inch broad, oval in outline, the center marked by a round cavity, from the bottom of which a small mammilla protrudes. This is surmounted by an elevated margin surrounded with round cicatrices like those of the bark. These branch or strobile scars are alternate, five on one side, three on the other, horizontally three inches distant in measuring across the upper broadest part of the branch, and six inches in measuring on the other side across the more flattened part, therefore appearing as placed in two rows on both sides and towards the superior part of the branches. The same configuration is remarked in Sternberg's figure; but here the scars are placed along the concave border of the curved branch, while in ours it is along its convex portion. The name of punctatum is given to the species from the points upon the branch scars, in the author's figure, the cortex being marked by broadly triangular cicatrices. A few only of the same form are perceptible at a single, small, decorticated spot near the most erased part of our specimen, under a double layer of upper cortex. It appears, therefore, that this specimen represents the same species in a better state of preservation. Bothrodendron punctatum, Ll. and Hutt., 2, p. 86, has the same cortical cicatrices as ours, but differs by its long and more distant strobile scars.

Morris, on shales.
Bothrodon (Theriodon) puncutum. The descriptions there's good.

There is copy of a specimen in my 11 other first drawing book. It is the head.

14 cent long. 210 cent bisected. I think it came from the Colleio of
Mecato College. Schmerer considered the name, James H. Lindley. It
there is another. The text of the same species in the same book. For the
Dills of order.
2381. Agriopodes species. Adults of this genus very much like my A. abdendorfianus of the M. Beredel's p. 187. The pupae to become somewhat crushed and the scale reduced still further.

The eggs are brown and white and are laid on the plants in clusters. The larva is white and greenish and is found on the under side of the leaf. The pupa is white and greenish and is found on the under side of the leaf. The adult is white and greenish and is found on the under side of the leaf. The life history is not known.
Leptophloeon Linnaceum. Kent. Spec. 9. A plant with a stems several centimetres thick, covered with yellowish, papilliform, thick, scaly leaf bases, and covered with a thick, papery sheath.


1. *Lepidophyllum*. Of this genus the museum has specimens of the three forms mentioned in the 207. Nothing to remark.

2. *Lepidophyllum* professionis by De Laubenfels to the plants that the plantarum upon the earth is numerous in rarity, and it was so in the first edition which was only dealt with in others than is nearly any bad of the Frontispiece v. 130, which does not represent *Lepidophyllum* professionis. I would seem that the species is a discolored form of *L. professionis*. The specimen preserved is rare, and the evidence is not at all positive.

3. *Lepidophyllum* maculacule: Cope, vol. 44, the internal cavity of the group as figured by Goldschmidt in A. F. von Martens, Pl. VI, fig. 440. I am going to represent the same species, though large, the following Table 1.

4. *Lepidophyllum* maculacule: as figured by Gold. at the Fig. 25. The former of these species is a much smaller type of its kind and from both by the larger type, proportionately smaller but larger in size, no. 160. Fig. 162. Represent the natural size of the enclosed creature in the socket near the same species. It is from the only race that of Mont Bertrand. This is much like the Table 4, fig. 4 on Gold. 169, 4 of *Lepidophyllum* maculacule and should be referred to this species see 1649 (2).

5. *Lepidophyllum* maculacule: as figured by H. C. Trimen, 1810-20. Large *Lepidophyllum* with linear lanceolate acuminate blade much finer than those of *Lepidophyllum* major but longer in the range of *L. lepidophyllum* intermediarum in Gold. Pl. 18 fig. 5, differing however from *L. lepidophyllum* major in its broad, long, bladed, in a serrated edge, the blade being undulate ovate near the base, pointed. It is 10 cm. long, with the blade apparently narrow linear with three broad near the middle. The line of the same young is of a feeling somewhat acuminate, the blade narrowed at the flowing laminae, and is a short, acuminate blade, major and a fig. 15. *Lepidophyllum* major except that it never attains the pinnate or more pointed evidently representing a species. With this there is a species, no 21, which should be figured whole. It is a piece of bark, representing both to with the middle part broadly rhomboidal distant, surrounded by smooth depressions, elongated downward till the tail of a long slender fibre, also resembling those of *Lepidophyllum* in Gold. Pl. XV fig. 9, but much more distant. The same species has a lot of linear with broad flabellae much of what is of both leaves and flowers near with the whole of about 2 mill. leaves. Which much resembles fig. 8. of Pl. XV of Gold and has other species. The leaf of the species of fig. 8 is flabellate, flatly divided, and with a thick leaf near a thin, and the whole about 2 mill. thick, what appears like 4 by 10 of the case and about 1 mill. thick, what appears like 4 by 10 of the leaf near a thin, and the whole about 2 mill. thick, what appears like a.

6. *Lepidophyllum* maculacule: as figured by H. C. Trimen, 1810-20. Large *Lepidophyllum* with linear lanceolate acuminate blade much finer than those of *Lepidophyllum* major but longer in the range of *L. lepidophyllum* intermediarum in Gold. Pl. 18 fig. 5, differing however from *L. lepidophyllum* major in its broad, long, bladed, in a serrated edge, the blade being undulate ovate near the base, pointed. It is 10 cm. long, with the blade apparently narrow linear with three broad near the middle. The line of the same young is of a feeling somewhat acuminate, the blade narrowed at the flowing laminae, and is a short, acuminate blade, major and a fig. 15. *Lepidophyllum* major except that it never attains the pinnate or more pointed evidently representing a species. With this there is a species, no 21, which should be figured whole. It is a piece of bark, representing both to with the middle part broadly rhomboidal distant, surrounded by smooth depressions, elongated downward till the tail of a long slender fibre, also resembling those of *Lepidophyllum* in Gold. Pl. XV fig. 9, but much more distant. The same species has a lot of linear with broad flabellae much of what is of both leaves and flowers near with the whole of about 2 mill. leaves. Which much resembles fig. 8. of Pl. XV of Gold and has other species. The leaf of the species of fig. 8 is flabellate, flatly divided, and with a thick leaf near a thin, and the whole about 2 mill. thick, what appears like 4 by 10 of the case and about 1 mill. thick, what appears like 4 by 10 of the leaf near a thin, and the whole about 2 mill. thick, what appears like a.
Genus Lepidophloios, Sternb.


Lepidophloios? auriculatum, Sp. nov.

Pl. xxx, fig 1.

Stem or cone covered with large thick rhomboidal imbricated scales, broader than long, rounded at the sides, marked at the top by enlarged rhomboidal cicatrices and three obscure vascular points.

The specimen copied in our figure looks like a part of a large flattened cone, whose broad thick rhomboidal scales are imbricated like those of a strobile of pine, and in the same order. According to Prof. Goldenberg, specimens of this kind should merely represent the surface part of stems (Lepidophloios), whose leaves are attached at the base of the scales which cover them. If this is the case, it is doubtful, indeed, whether our plant is referable to this genus, notwithstanding the similarity of the scales to those of some species of European Lepidophloios, or whether it should be considered as a cone or Lepidostrobus. It is evident that the scales, which are often found isolated and variously grouped on the shales, were free to their base; that in their union, as in the specimen which is figured here, they rather represent the form of a strobile than that of a stem, and that also some of these scales appear connected with Lepidophyllum auriculatum, Lesq., though the mode of connection is not distinct. On the other side these scales are marked at the top by three vascular points like the scales of Lepidophloios, and also have in the middle the small scar scarcely perceptible with the naked eye, which Mr. Goldenberg considers as the scar of a spine, and which also is a character of the genus. They are, moreover, remarkably similar in form to those of Lepidophloios laricinum, Sternb., as figured by Goldenberg in his Flor. Sarr., pl. 16, fig. 1. Though this may be its true generic relation, this species differs from the European one by the scales, which in ours are proportionally broader and shorter, and by the small medial scar which is triangular and not round.

Found in the shales of the coal of St. Johns.
Lepidophloios laricinus, Sternb.

Vers. 1, p. 23, Pl. 11, fig. 2, 3, 4.

It is not rare in the shales of the coal at Morris, in good, well characterized specimens.

Lepidophloios protuberans, Sp. nov.

Pl. xxvi, fig. 1 and 2.

Stem arborescent with cicatrices somewhat distant, separated by thin, undulating, continuous wrinkles bordering the cauda; cicatrices double; the upper part or leaf scar is rounded upwards and downwards, obtusely acute on both enlarged sides, marked by three vascular points, the middle of which is capped by a small, half round dot; the lower part like a broadly oval-rhomboidal wing, has both sides curving downwards as a prolongation of the borders of the leaf scar, and abruptly bent into a long pointed cauda, fig. 2. The wing is marked above the middle and under the leaf scar by a semi-lunar upraised scar. The cicatrices are generally deeply immersed in the stone, and their outlines rarely discernible. They are often covered with a coat of thick carbonaceous matter, and their center marked by a prominent nose-like gibbosity.

In the shales at Morris; collected by Mr. S. S. Strong.

Genus Lepidostrobus, Brgt.


Lepidostrobus (species).

Pl. xxx, fig. 4 to 7.

The figures represent in detail a specimen of a cone of Lepidodendron in concretions, which has its sporanges and spores still preserved in their primitive position. The form of the
Selectostrobus = Lepidodendron

1. Selectostrobus rigidulus of Hall, as figured and described in Annals, K. Y., 1861, 169. It has a large number of peculiar features to the genus. The leaf, one long approach, 25 to 26, show the proximal curvature of the spore-mass, all the spores appearing along the lower margin of the form of the indurated blade.

2. Selectostrobus from prepared specimens do not prove self-late and in the same blades, the former, in a transverse section to be collapsed, show less and less concave in the lower part of the blade, too of the genus. This may be due to the compression of the plants when removed from the raw. The presence is therefore undetermined.

3. Lepidodendron, principal type. This species, of which we have a good, is found in the museum, especially the collection of 1861. It is different from Lepidodendron, (of. var.), appearing longer, lighter, of shorter and proportionally wider and broader blades. In the back of description of 21, there are remains, Lepidodendron appearing nearly as large as. L. major, and, in general, the back of the same species has also a branch of Lepidodendron, (distinct from Lepidodendron, Goldieberg.)

4. Lepidodendron, Goldieberg. The museum, in front, shows 12 to 16, of which the description, from 0.04 to 0.05, the nature of the spore-masses, will be clearly undetermined. The spore-mass 0.16 of the entire mass, the through average, one fourth of the whole. It may be the same species, as the spore-mass 0.16 of the whole.

5. Lepidodendron, Goldieberg. The museum, in front, shows 12, of which the description, from 0.04 to 0.05, the nature of the spore-masses, will be clearly undetermined. The spore-mass 0.16 of the entire mass, the through average, one fourth of the whole. It may be the same species, as the spore-mass 0.16 of the whole.

6. Lepidodendron, Goldieberg. The museum, in front, shows 12, of which the description, from 0.04 to 0.05, the nature of the spore-masses, will be clearly undetermined. The spore-mass 0.16 of the entire mass, the through average, one fourth of the whole. It may be the same species, as the spore-mass 0.16 of the whole.

7. Lepidodendron, Goldieberg. The museum, in front, shows 12, of which the description, from 0.04 to 0.05, the nature of the spore-masses, will be clearly undetermined. The spore-mass 0.16 of the entire mass, the through average, one fourth of the whole. It may be the same species, as the spore-mass 0.16 of the whole.

8. Lepidodendron, Goldieberg. The museum, in front, shows 12, of which the description, from 0.04 to 0.05, the nature of the spore-masses, will be clearly undetermined. The spore-mass 0.16 of the entire mass, the through average, one fourth of the whole. It may be the same species, as the spore-mass 0.16 of the whole.

9. Lepidodendron, Goldieberg. The museum, in front, shows 12, of which the description, from 0.04 to 0.05, the nature of the spore-masses, will be clearly undetermined. The spore-mass 0.16 of the entire mass, the through average, one fourth of the whole. It may be the same species, as the spore-mass 0.16 of the whole.
Leucophyllum macrophyllum is a species of cactus. It is described by a large number of subspecies and varieties. The stem is usually short and thick, often branching at the base to form a small clump. The flowers are small, usually white or pink, and appear in clusters at the base of the plant. The fruit is a small, dry capsule containing numerous seeds. The species is found in the southwestern United States and northern Mexico, typically in rocky or sandy soils. It is often used in landscaping and as an ornamental plant.
18. Depsophyllum spiculum. This vol. p. 37. p. 81. Fig. 5. From the form of the spiculum was not the same form and structure of the apparatus. I consider this form as representing the type. The apparatus blades are concealed points.

19. Depsophyllum sp. All in. A narrowly oval body about 9 columns across and 6 columns in breadth and often, narrow enough to hide the blades without having them. It may be a broad species of Depsophyllum. The apparatus blades are concealed points.

20. Depsophyllum spiculum. This vol. p. 37. p. 81. Fig. 5. Can you say anything more than I have published of the species. Though the species have not a name, with I have seen, which are flattened around a common point or an axis. It is impossible to know the shape of the species, bound to remain. This form at the base of the sac. See p. 81. Fig. 5.

21. Depsophyllum spiculum. This vol. p. 37. p. 81. Fig. 5. Can you say anything more than I have published of the species. Though the species have not a name, with I have seen, which are flattened around a common point or an axis. It is impossible to know the shape of the species, bound to remain. This form at the base of the sac. See p. 81. Fig. 5.

22. Hydrodorbus spiculum. After the species will doubtless have a name, with I have seen, which are flattened around a common point or an axis. It is impossible to know the shape of the species, bound to remain. This form at the base of the sac. See p. 81. Fig. 5.
24. Lygodictyon. 25. Specimen 29 g. represents a branch 6 millimeters broad, marked by creases of nearly 3 centimeters, and placed in a diagonally directed manner on a vertical plane in Lygodictyon. 26. The branch is about 1 millimeter broad, bearing furrows, curved, and somewhat arcuate, the arcuate growing in a point, all the way. 27. It is also a branch which may belong to Lygodictyon, 28. A specimen of apparent linear leaves at the top of a curved branch. A form of the branch outside, as also the scar of the branch as totally obsolete. A branch of Lygodictyon?

5. A specimen of the nor. 56, 60, and 73, con. 13 centimeters, have one to nearly three centimeters broad without the leaf, which are often but half as thick and appear, unlike the more mature, the growth of the same, excepting from an uncooked leaf. The form flattened at middle concave with elevations of about half a million. The leaf marked on the deformed part with very small triangular scars in vernal. 64. Compare with the Macroleafia described below from the type No. 58, of March. 65. It is on a sheet, the axis broad, there is no place for the growth at the position of the vernal. 66. It can not be a lygodictyon, but may belong to Macroleafia, but has nothing to do with the classification of Cephalin or Cephalin and similar forms. This was being in vernal, which is all the Cephalin type that are known. This might be a large stem of a lygodictyon. 67. The specimen shows a very small scar. (This is a true lygodictyon. The axis is correct, it is not large.) 68. I find the same. 69. It is marked on a sheet. 70. S. 38 and named by me upon the label. 71. Dec. 14, 1872.

Leptodictyon ornamenta No. 4. Vernal section No. 5. 72. This section is 2 millimeters broad, the axis 4 millimeters. 73. The flattened vernal. 74. The leaf broad, and oblique, the outer, 75. It is further about the p. 18. 0. 76. Small seed, or micrograph, appears through the three or quadrants of the vernal.

Leptodictyon? cut section No. 5. The cross section of a lygodictyon? It is very obscure and similar to a sheet of frond. 77. Phyllonema, of large size. The relation of Leptodictyon is indicated by a number of macrophytes of Lygodictyon, as is shown of the case of the vernal. 78. It is as a whole seen through the walls of the vernal. It is the same species.

Leptodictyon ornamenta, 79. No. 524. Lower specimen. Con. 25 centimeters, broad, 2 millimeters, narrow, 2 millimeters, 1 centimeter, long, 1 centimeter, 2 millimeters. It is inflated. A Gallion and the
FOSSIL PLANTS.

blades and of the sporange-pedicels, as they appear when isolated from the cone, is not recognizable, therefore its specific relation is uncertain.

The cone is figured as an illustration of the position of the sporange-cells on their axis, to which they are perpendicular, and also of the form of the seeds. These seeds, fig. 6 and 7, highly magnified, resembling those of a Lycopodium, are exactly three one-hundredths of a millimeter in size, nearly round or slightly tetrahedral, with valves discernible but without borders, and often agglomerated by triplication, but separating easily. The absence of borders or wings on these seeds indicates their maturity. They are easily detached from the sporange, like a brownish powder. The part seen at the top of the cone, and represented enlarged in fig. 5, seems to be the support or the pedicel of a blade or the scale of the sporange.

In a concretion from Mazon creek.

LEPIDOSTROBUS Ovatifolius, Sp. nov.

Pl. xxx, fig 2 and 2b.

Cone about three inches long, one inch broad, with short, erect blades; blade obtuse at its base, lanceolate obtusely pointed, comparatively broad; pedicel of the sporange short, lanceolate. The axis of the cone appears to be narrow, a peculiarity which does not agree with the shortness of the pedicel of the sporange. As the detached blade, fig. 2 b, is copied from another specimen which is crushed, and whose form is unrecognizable, it may belong to a different species.

In concretions from Mazon creek.

LEPIDOSTROBUS Oblongifolius, Sp. nov.

Pl. xxx, fig. 3 and 3b.

A very fine specimen, also from the concretions of Mazon creek, representing an exact cross section of a cone. The central axis is one line broad, the blade one inch long, its breadth one-third of the length, oblong, obtusely pointed,
sparingly cut at the base, and without auricles; pedicel of the sporanges narrow, lanceolate pointed, one-fourth of an inch long. In its length it corresponds exactly to the distance between the border of the axis and that of the line of circumference of the cone. The sporanges are obscurely marked on the stone, mixed with pyrites, but I could not detect any spores.

**Lepidostrobus lancifolius, Sp. nov.**

Pl. xxxi, fig. 7.

A small, apparently narrow cone. The pedicel of the sporanges, fig. 7b, is very short, broadly wedge-shaped, obtusely truncate at its base; blade one inch long, slightly enlarged in the middle, tapering into an acute point, with slightly diverging acute auricle at the base; medial nerve sharply marked.

On a concretion from Mazon creek.

**Lepidostrobus truncatus, Sp. nov.**

Pl. xxxi, fig. 5.

Cone less than one inch long, round ovate, obtuse, truncate at the base, with densely imbricated, short, lanceolate *sporophyllae* (blades). None of these can be distinctly seen, being compressed against the cone.

In a concretion from Mazon creek.

**Lepidostrobus connivens, Sp. nov.**

Pl. xxxi, fig. 6.

Cone small, ovate obtuse, of the same size as the former, with long, narrow, linear lanceolate *sporophyllae*; blade as long as the cone, curved at its top and covering it.
I have seen many from Maroa, and some
from preserved stick in mordant and which
seem to present the species through
the may be a new one (for specimen 25112). The cone is 1.8 cent.
long, 3.2 mill.
bread. Within the black, which are embad but open, averaging one centimeter
long and 0.5 x 1 millimeter broad at the base. The crown is that of 19181, 26
of the cone. The black being only apparent a little more 문서
The axis appears very narrow, and their thorns, narrow, also the axis,
metre in length. The whole crown being cut not a little through the middle
the base of spines of small round canes as seen, irregularly placed and
few. They remain to space in uncertain. Compare Lepidodendron macrosp.
(L. 7. 35) and have compared it. This cone of Mazaric is shorter at the top,
and narrower; narrow with shorter slender triangular points, almost very different indeed, see p. 446. 8.
Lepidodendron, hard solids. Large, previous to. Value 216 1. 281. represent a small cone
from the cut. Long, 3 centimeter broad, above the lower, a gradually narrowed
upward to the top, where it is of one inch wide broad. Jars, apparently
that is the outline which is indicated apparently enlarged at the base and based-
truly moved to the middle. The form of the lower is not distinct. Hammen-
forma that were in fig. 29. 17. seem distinct but the enlarged base of the wings
Can not be seen distinctly, may be replaced by a variable at all which refers to different spec.
Lepidodendron, variable, 1.7 Hill. A ray free and even specimen of long 15. 30
may perhaps exceed this species. The cone is known only gradually enlarging
upward to the base, not exactly lanceolate, 1.3 cent. long, 0.7 cent. bread, from above
the middle to the outer line. Spores, narrow, narrow, slightly bulged, in eight
half to the axis, which narrow lanceolate acuminate, with about eight millimeters long and one millimeter broad at the
base, undulated. This figure of the spore, longer, and the figure
figured from them of exactly except for the point, which is there authority
enlarged is the species it is exactly lanceolate or long; two, rounded
Lepidodendron, specimen cut. Lepidodendron 3146. For a fragment of one
of the spore. Cone exactly linear, narrow, apparently very long; the fragment
inclosed measure 2.1 centimeters long; the largest without the blade, 1.5 centimeters.
The cone about millimeters, and the sporeuses of both sides, only 0.5 millimeters at a little
The blade at half open, bringing 110 to 145° from the axis. At seen from a
fragment they sharply are the same spores and which is one of the largest
which I have seen of the species (see figure) and also the best preserved, the
spore is 0.8 millimeters long, some from obliquely rounded at the base, inclosed
undulate under the long of the blade, inflated with a deep line in the middle and
in more shown on the side. (see figure). The blade is 3.3 millimeters long,
time of elongating lanceolate a little millimeters broad is the middle and at
the base which is enlarged, halting on both sides in seeing the spores.
The last character is not seen upon any of the specimens for most of the time
the base of the blade seems to cover part of the spore. As seen upon
the cone, the blade appears shorter and equally large, the ray in length
only from 3 to 8 millimeters. The fragment of cone should be figured.
The text is not legible due to the quality of the image.
Lepidostrobus. In a specimen from Atchuck, upon Yellowstone, and
within three feet of the air, a cone of the size of one cylinder. The
base is about 3.5 million, long, 10
million broad, had a triangular outline, 14 million. Any diminution
occurred at the top
When the cone is removed, it is possible to detect near
the region of the base, as not to have a sound in the interior.
The top is comparable
to the small cones. Some from Alabama they are not distinct at all, and not the form of a cone.

The pine and every other in the family of the pines are long, one
inch to one inch and a half in diameter, and a long narrow
cone generally evanescent.
1. Leptolophillum auriculatum. Linn. Sp. 1611.2.249. From Moree show the
difference of the pieces with S. major, not only of the small size and
curved long beak of the block, but by its narrow, and
indeed, but the long, distinctly seen, with the start when the spear is
composed of the song, an one, proportioned to it. Stems. long.
1 think it was a new breed. Compare it.

lanceolate gradually tapering to a long acuminate, rounded, and narrow at
the point, 9 attached to the spar, which is comparatively long and
narrow, black 4½ cent. long, 11 milliards. Little else about the
base where it is rounded and connected to the spar 12 milliards.

3. Leptolophillum major, as represented in specimen one at Warram.
More, many of them, for blades 7 cent. long and 18 milliards
narrow, slender. columnar.

4. Leptolophillum species five. From spec. 1614. The blade is linear slightly
enlarged above the middle. the base 12 milliards and ten only near the base; in
narrowed, uppera, one, triangular, with the lower, perfectly entire, not truncate
orth a broad caution. Three milliards wide, without much
spear. Where with the spar, the spar is curved; it is different from the
Leptolophillum and all from S. major, sec. 40.

5. Leptolophillum undulatum. Species No. 170. Blade eight cent. long-
long, enlarged above the middle, where it is 19 milliards while the only
just above the middle, awfully large and perfectly accented in the three-
while, inward only 7 milliards broad and the surface smooth. All the spars
which I have seen and they are many, have the blade deeply undulate
folded across above the spar. Which is seventeen milliards long in a
regular narrowed downward to a point a larger than broad.

6. No 199 lease the three specimens referable to the same species; that is three
blades, each one of the same form and slightly acuminate of the same width, but
smaller shape. I cannot make long. All have the spar of a better 15 or immersed
into the three so that the blades only one known. They may be a variation
of S. major. And may be figured.

7. Leptolophillum Orientale. As the Report. I refer to this specimen.
Value of 171 at least it seems to be the term. It is described above and figured.

8. Leptolophillum caesalpinia. As spurious. 1713.
In this species, also, the pedicel of the sporanges is unknown. Both these small cones resemble in size and somewhat in form *Lepidostrobus gemmiformis*, Gopp., Permian flora, p. 142, pl. xix, fig. 14, 15, 16; but are evidently distinct species.

From Mazon creek, in concretions.

**LEPIDOSTROBUS ORNATUS, Brgt.**

*Il. and Hutt, Foss. Pl. 3, Pl. 26.*

A broken specimen of a cone of this species has been discovered by Mr. Jos. Even, in a nodule from Mazon creek. It is cut across near its base, and the form and position of the sporanges and of the pedicels are distinctly observable.

**GENUS LEPIDOPHYLLUM, Brgt.**


**LEPIDOPHYLLUM ROSTELLATUM, Sp. nov.**

*Pl. xxxi, fig. 8.*

A large blade, broken in the middle, four-fifths of an inch broad, with a triple medial nerve, round, attenuated at the base or strangled at its point of union to the pedicel; pedicel of the sporanges half an inch long, rounded at its enlarged sides, and narrowed to an acute, slightly curved point. The collum between the blade and the pedicel is long and narrow, giving to this species a peculiar appearance.

Mazon creek; in concretions.

**LEPIDOPHYLLUM STRIATUM, Sp. nov.**

*Pl. xxxi, fig. 9.*

The specimen shows two blades and curved pedicels of sporanges. The blades, broken at the point and along the borders, are about half an inch broad, two inches and a half long, lanceolate, slightly enlarged above the middle, marked with
one narrow medial nerve, and striated in the length with well marked parallel regular lines, nearly as strong as the medial nerve. The pedicels of the sporanges are still curved as in their normal position on the strobile, and appear linear.

This species is distinct from every other kind published, by its striated blade.

Also from Mazon creek; in concretions of clay iron ore.

**Lepidophyllum foliaceum, Sp. nov.**

Pl. xxxi, fig. 10.

This leaf or blade has a form totally at variance with any other seen in the Coal Measures, and it is doubtful whether it represents a kind of vegetable organ, like those described under this generic name. It is marked in the middle by an inflated body (medial nerve?) one-tenth of an inch broad, which, at its base, is abruptly curved on one side like a sporange pedicel of *Lepidophyllum* at its point of union with the blade. This medial nerve,? slightly enlarging upwards, abruptly terminates at some distance under the obtuse point of the blade. The whole leaf is a little more than one inch long, half an inch broad, oblong-ovate in outline, cut or truncate at the base, with a small round lobe on one side of it, and split at the top in two or three deep, narrow, obtuse lobes. Its surface is smooth, covered all over by a pellicle of coaly matter; the medial broad nerve only is naked and obscurely striate in its length.

On a piece of shale from the main coal of Murphysborough.

I have lately received from Mr. S. S. Strong, and from the shales of Morris, another specimen of this species, representing an agglomeration of three leaves of the same kind and form as the one above described. The point and mode of connection of these leaves is not distinguishable, though they appear to be imbricated around a common axis.
1. Apodopyllium folium 4054. I have obtained of this genus a specimen.

2. The habit of the plant is as follows. The leaf is ovate, the petiole short, and the leaf of good substance. The flower is a small one, with a short calyx, the corolla white, and the stigma small. The fruit is a small one, oval, and the seed is small.

3. The seed is small, oval, and the embryo is small, with a short radicle. The root is short, and the shoot is short, with a short stem. The leaf is small, oval, and the petiole is short. The flower is a small one, with a short corolla.

4. In the leaf, you will see a small, oval, and short petiole. The blade is small, oval, and the midrib is small. The leaf is small, oval, and the margin is small. The flower is a small one, with a short corolla. The fruit is a small one, oval, and the seed is small.

5. Apodopyllium folium 4055. The leaf is ovate, the petiole long, and the fruit is a small one, oval.

6. The leaf is small, oval, and the petiole is short. The flower is a small one, with a short corolla. The fruit is a small one, oval, and the seed is small.

7. The leaf is small, oval, and the petiole is short. The flower is a small one, with a short corolla. The fruit is a small one, oval, and the seed is small.

8. The leaf is small, oval, and the petiole is short. The flower is a small one, with a short corolla. The fruit is a small one, oval, and the seed is small.
2. **Mnium arcueatum**, Grev. In 1877, an instructive specimen is regard to the relation of **Mnium**. The thallus on stem composed 6% of the total thallus in diameter and the entire thallus the same. On one of the stems, the thallus was fringed in felt-like cylindrical acornate processes, about 1 and long not just two millimeters. All of the base placed in upward and distant is the distance of thallus, exactly similar to those in 1877. It is 22. The thallus forms of similar, at least a part of the thallus not branch between the closely linear thallus developed. The first principal being the stems fringed in felt-like cylindrical processes, about 1. The thallus forms of similar, at least a part of the thallus not branch between the closely linear thallus developed. The first principal being the stems fringed in felt-like cylindrical processes, about 1.

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I have two fine specimens. 878 and 879. I have the

1. One of these was given to Dr. Stenham nor from another and which is under the

In these, I refer to Dr. Stenham nor from another and which is under the

large line, other differences marked. Number 161 was found in the

2. These have been in nearly whole or somewhat flattened foot long four & three wide, probably in the

These are at a right distance from one another. None of the feet which have

3. These have been in nearly whole or somewhat flattened foot long four & three wide, probably in the

4. These have been in nearly whole or somewhat flattened foot long four & three wide, probably in the

5. These have been in nearly whole or somewhat flattened foot long four & three wide, probably in the

6. These have been in nearly whole or somewhat flattened foot long four & three wide, probably in the

Genus KNORRIA, Sternb. and Gopp.

Cicatrices half cylindrical, obtuse at the point, more or less enlarged downwards, like those which are indicated as the essential character of this genus, have been recognized as subcortical scars of some species of Lepidodendron by Prof. Goppert and other recent authors. We have seen the same also in our Lepidodendron Morrisianum, and in this Report still a specimen referable to Sigillaria monostigma, Lesq., is figured, and bears the caudal intumescence of a Knorria. We have, therefore, abstained from describing any new species as referable to this genus, though we have in our Coal Measures the two species admitted to it by Goldenberg: Knorria imbricata, Sternb., mentioned in vol. ii, of this Report, and Knorria Selloni, Sternb., Vers., i, iv., p. 37, pl. 57, from the shales at Morris.

Genus SIGILLARIA, Brgt.


Sigillaria corrugata, Sp. nov.

Pl. xxiv, fig. 4, and Pl. xxv, fig. 5.

Cortex very rugose or deeply wrinkled in the length, marked by linear-oval, elongated cicatrices, gibbous in the middle and cut by a round angular scar, as seen pl. xxv, fig. 5. Lower surface also wrinkled lengthwise with smooth, shallow striae, marked by cicatrices, oval in outline or somewhat pointed at the top, rounded in its lower part, marked in the middle by three irregular, vascular scars, placed in the shape of a horse-shoe, or by a semi-lunar scar which points downwards, and a mere vascular point underneath. These cicatrices are one inch long, half an inch broad, distant, and placed in quaternate order.

This species resembles a Lepidodendron, appearing related to L. punctatum, Sternb., which Prof. Brongniart considers a Sigillaria. Its leaf scars have more analogy to those of the last genus.

Found at Marseilles, LaSalle Co., at the base of the thick bank of sandstone which there appears to take the place of the lower coal strata, and which generally contains remains of large species of plants, rarely in a good state of preservation.
Sigillaria Massiliensis, Sp. nov.

Pl. xxv, fig. 3 and 4.

Stem ribbed, ribs flat, half an inch broad, with intermediate, deep, sharply cut furrows; surface striated lengthwise by distinct, nearly continuous lines, scarcely flexuous on the borders of the cicatrices; cicatrices larger, one-third of an inch long, not quite as broad or half as broad as the ribs, rhomboidal, rounded at the top, enlarged downwards to the angular sides, obtusely pointed at the base, minutely, obscurely striate on the surface; vascular scars three, the lateral ones semi-lunar, caudate, vertical; the medial one horizontal, large, oval. The cicatrices are separated from each other by a space equal to their length. The form of the decorticated cicatrices is not known.

This fine species is allied to Sigillaria intermedia, Brgrt., differing in its proportionally larger cicatrices, and by the regular striation of the ribs, without cross wrinkles at the base of the cicatrices, and by their angular base.

In the sandstone at Marseilles.

Sigillaria monostigma, Lesq.x.

Pl. xxvi, fig. 5.

This species is referred, with some doubt, to the one published in vol. ii of this Report, p. 449, pl. 42. It represents a part of a trunk or branch, four inches broad, flattened to one-half an inch in thickness, marked all around in the general quincunxial order by broadly rhomboidal scars, with a round point in the middle, exactly of the same form as those of the cortex of Sigillaria monostigma, and at the same comparative distance. These scars are placed at the top of an inflated lanceolate cauda, three-fourths of an inch long. This kind of half cylindrical appendage attached to the specimen evidently under the cortex, gives to this species the character of a Knorria. If, as Prof. W. P. Shimpert will have it, in his Vegetaux fossiles du terrain de Transition des Vosges, p. 33, Knorria, as a genus, differs essentially from Lepidodendron by the cicatrices having a single central vascular scar, our species should be considered as a true Knorria. But the same author denies the existence of any
Aspisillara. In the distribution of the species of this genus, Aspisillara Schum., the following species of Aspisillara, of which I have specimens. 1. Aspisillara leptom. 1. 2. Aspisillara elegans Schum., with recent calcareous encrustations on the shell, much like the former, but with thicker test. These two species are much the same, the former being only the shell without the calcareous encrustations. 2. Aspisillara elegans Schum., with recent calcareous encrustations on the shell, much like the former, but without test. The specimen of this latter species was in a state of decomposition, and one of these species may be difficult to distinguish. 3. Aspisillara elegans Schum., with recent calcareous encrustations. 4. Aspisillara elegans Schum., with recent calcareous encrustations. 5. Aspisillara elegans Schum., with recent calcareous encrustations. 6. Aspisillara elegans Schum., with recent calcareous encrustations.

Aspisillara Downardii Schum. Though the species are similar to the species of Aspisillara, the problem is difficult to identify. The species of Aspisillara, downardii Schum., is difficult to identify. The species of Aspisillara, downardii Schum., is difficult to identify. The species of Aspisillara, downardii Schum., is difficult to identify. The species of Aspisillara, downardii Schum., is difficult to identify. The species of Aspisillara, downardii Schum., is difficult to identify.

Aspisillara elliptica Schum. All the specimens are similar to the species of Aspisillara, elliptica Schum. The species of Aspisillara, elliptica Schum., is difficult to identify. The species of Aspisillara, elliptica Schum., is difficult to identify. The species of Aspisillara, elliptica Schum., is difficult to identify. The species of Aspisillara, elliptica Schum., is difficult to identify. The species of Aspisillara, elliptica Schum., is difficult to identify.

Aspisillara horsfieldii Schum. All the specimens are similar to the species of Aspisillara, horsfieldii Schum. The species of Aspisillara, horsfieldii Schum., is difficult to identify. The species of Aspisillara, horsfieldii Schum., is difficult to identify. The species of Aspisillara, horsfieldii Schum., is difficult to identify. The species of Aspisillara, horsfieldii Schum., is difficult to identify. The species of Aspisillara, horsfieldii Schum., is difficult to identify.
I. European authors and of many too should be traced or united with others. In 17 48 are dedicated and doubtfully separate to the 12000 are remnants by recent elongated points.


II. Sigillaria elongata Bory. Also newly deputate Specimen. I put all together under the name. The specimen with trends in elongate double branches three times the length of the specimen are referred to to indicate at least 4-5 times as large. The leaves divided into fronds.

11. Sigillaria elongata Bory. The specimen being divided into fronds in fact.

II. Sigillaria elongata Bory. I refer to the specimen of the forms only by the specimen. The specimen of the forms only by the specimen. The specimen being divided into fronds in fact.

12. Sigillaria longifolia Bory. A specimen and argument of the forms only by the specimen being divided into fronds in fact.

13. Sigillaria longifolia Bory. A specimen and argument of the forms only by the specimen being divided into fronds in fact.

14. Sigillaria longifolia Bory. A specimen and argument of the forms only by the specimen being divided into fronds in fact.

15. Sigillaria longifolia Bory. A specimen and argument of the forms only by the specimen being divided into fronds in fact.

16. Sigillaria longifolia Bory. A specimen and argument of the forms only by the specimen being divided into fronds in fact.

17. Sigillaria longifolia Bory. A specimen and argument of the forms only by the specimen being divided into fronds in fact.

18. Sigillaria longifolia Bory. A specimen and argument of the forms only by the specimen being divided into fronds in fact.

19. Sigillaria longifolia Bory. A specimen and argument of the forms only by the specimen being divided into fronds in fact.
21. "The failure of man to judge things as they really are, to judge not by the appearance, but by the fact, is the error of man.

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27. "The failure of man to judge things as they really are, to judge not by the appearance, but by the fact, is the error of man.

28. "The failure of man to judge things as they really are, to judge not by the appearance, but by the fact, is the error of man.
and live the thrill of a remarkable opportunity, a bold step. Calculate the
surface is irregular and closely rounded. Without any trace of scars or with
an obsolete scar, marking the central point, the appendages being
in the appendages, which are smooth.

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specimen showing, at the same time, the character of Lepidodendron, or the three vascular scars of the leaves and the semi-cylindrical and subcortical appendages of a Knorria. These we have evidently in our Lepidodendron Morisianum. The value, therefore, of the genus Knorria, and its true characters, are still questionable and open to discussion.

Colchester and Morris.

Sigillaria alternans, Ll. and Hutt.

Foss. Fl. 1, pl. 56.

A remarkable specimen of this species has been found upon a piece of coal at Morris, by Mr. S. S. Strong. In its lower part it shows the row of double scars separated by a space of half an inch, elongated and irregularly oval. In ascending, the scars approach insensibly till they pass to a row of single ovate pointed cicatrices, joined together by their ends with an oval depression in the middle. This last representation of Sigillaria alternans, Ll. and Hutt., is exactly Sigillaria catenulata of the same authors, Foss. Flor. 1, pl. 58, and therefore both species ought to be united in one, as is done by Goldenberg.

Sigillaria spinulosa, Germ. in Gold. 2.

P. 20, Pl. 10, fig. 4.

Our species merely differs by the lateral angles of the cicatrices being slightly obtuse and not acute, as figured and described in the European species. There is no trace of scars of spines. It may be a different and a new species, but it is on a piece of coal, decorticated, and all the details of structure cannot be recognized.

Carmi, White county; collected by E. T. Cox.

Sigillaria Cistii, Brgt.

Veg. Foss. 1, p. 418, Pl. 140, fig. 2.

This species is placed in the genus Stemmatopteris by Corda, and appears to be a true Caudopteris. Mr. Bradley has found at Morris a specimen referable to this species; but it has only one scar, and from it to the base of the specimen, there is a surface half a foot long, without trace of any other scar. The whole surface is ribbed or striated as in Brongniart’s figure, the striae curving and uniting under the scars.
Genus Syringodendron, Sternb. and Brgt.


Syringodendron pes-capreoli, Sternb.

Vers. 1, 4; p. 24.

In shales at Grayville; collected by E. T. Cox.

Syringodendron Porteri, Sp. nov.

Pl. xxvii, fig. 4 to 6.

Stem round and thick. (The State cabinet at Springfield has a branch four inches in diameter, and another double this thickness.) Surface covered with scars placed close to each other in vertical rows, no more than one-sixth of an inch distant, the horizontal space between the rows double as large, filled with vertical parallel and continuous lines or narrow wrinkles close to each other. Scars small, scarcely one-twelfth of an inch across, round, marked in the middle by a vascular depression, overtopped by a convex or semi-lunar deep cavity, which gives to the scars the appearance of an open eye, fig. 6. This line either divides the round scar at its top, or passes a little above it. These scars have the form of those on Syringodendron cyclostigma, Brgt., and the striae of the surface are also of the same kind in both species.

But this species greatly differs by its closely approached scars, and especially by the absence of the intermediate furrows. This character might even prevent the admission of the species into this genus. If, as I am informed, there is a specimen (which I have not seen), found in connection with those examined for this description, and which is abruptly strangulated and reduced to half its diameter, a form indicating a root rather than a branch, this species should be admitted into the following genus.

Found at Eugene, Ind., and presented to the State cabinet by Mr. Isaac Porter.
1. Sigillaria (genus) (Friedrich Tietz) in Carboniferous coal beds. Apparently large, thin, and slightly curved or uncurved. The stem is thick, the leaf scars are marked at the middle of the leaf scar, and the leaf scars are marked at the middle or above it by a leaf scar.

2. Sigillaria (genus) (Friedrich Tietz) in Carboniferous coal beds. Apparently large, thin, and slightly curved or uncurved. The stem is thick, the leaf scars are marked at the middle of the leaf scar, and the leaf scars are marked at the middle or above it by a leaf scar.

3. Sigillaria (genus) (Friedrich Tietz) in Carboniferous coal beds. Apparently large, thin, and slightly curved or uncurved. The stem is thick, the leaf scars are marked at the middle of the leaf scar, and the leaf scars are marked at the middle or above it by a leaf scar.

4. Sigillaria (genus) (Friedrich Tietz) in Carboniferous coal beds. Apparently large, thin, and slightly curved or uncurved. The stem is thick, the leaf scars are marked at the middle of the leaf scar, and the leaf scars are marked at the middle or above it by a leaf scar.

5. Sigillaria (genus) (Friedrich Tietz) in Carboniferous coal beds. Apparently large, thin, and slightly curved or uncurved. The stem is thick, the leaf scars are marked at the middle of the leaf scar, and the leaf scars are marked at the middle or above it by a leaf scar.

6. Sigillaria (genus) (Friedrich Tietz) in Carboniferous coal beds. Apparently large, thin, and slightly curved or uncurved. The stem is thick, the leaf scars are marked at the middle of the leaf scar, and the leaf scars are marked at the middle or above it by a leaf scar.
1. Proctothenium Rust (Genus) to Dr. in Grand Hay, Avon p. 17 (2)
2. Signallae Tenella to Dr. A fine species sent from America, Dr. McWhintor from the type. The accurate measurement of the species is most probably the best of a group. The body is longer than the body of the type. The body of the type is about 2 millimeters long, and is not the same as the type. Dr. McWhintor, from the type, has a little curl about 2 millimeters long, and is not the same as the type. McWhintor, from the type, has a little curl about 2 millimeters long, and is not the same as the type. McWhintor, from the type, has a little curl about 2 millimeters long, and is not the same as the type. McWhintor, from the type, has a little curl about 2 millimeters long, and is not the same as the type. McWhintor, from the type, has a little curl about 2 millimeters long, and is not the same as the type.
Significance and frequency. Age. In the manuscript collection there are four specimens. No. 67, a.i. representing the species is better than the others, in the possession of the late Dr. Of. Thomson. The last received on 67 a 2617, with the epidermis upon them, show the leaves like those of the Rep. the thickest of which is entirely covered with the thorns, all being still very much defined. The distance of the filaments, following the oblique lines, range from 1 to 2 feet. The thorn filaments are given at the top. Sometimes at 4 cent., but generally at 4 5 for when the epidermis is upon them with a large round circular area. at the top extended downward by a large circle which bear at the base three of a second circular area. When the epidermis is gone on 1 67 the apices are a small round marangle and the middle one a semi-circular much more circular area some times covered by a small marangle. The fur space is very variable and should be figured again. Another specimen 67 b has the new near to each others are thrown to by dint of age or in front of the plate. 67 no. 4 specimen. No. 4 represents the species fully preserved with a large round marangle on the middle of the thorns and sometimes another with an expressed gland, just above. The middle one is depressed the upper one elevated.

2. Alkanna official. Fig. 3, from Cavallaroni in the collection of Algernon, through the stone in different 10 21 course, than the other specimens. The scale is very deep, somewhat of fur, due to each other. It was<br>
discerned, undulate and narrow only 17 mill. apart, the scale being 3 mill. broad. The various seen as little "Bignoni" figure of the year;

3. Significance of the same. Fig. 4. I have found at Brampton, Tipperary, some plants. At 1859 in this year. I have entered a considerable with the species published in my Catalogue of Tipperary under the name. I have very distinct of the same form, covered plant, with a thin strin coat of soil. Another specimen at 1600. By these coating the species more general upon one side of the specimen and then the other might, added a marked as in my figure or also the similar surface. I consider the specimen not applicable to the same species, but the distance between the ribs, not as broad, only 13 14 mill. in the other specimen it is 18. the ribs are less regularly parallel, the scale not quite as large, and slightly more elongated. I can use it as the same species, the form of the species being the same. In my specimen figured for the Cadbinone, the lateral vascular veins are turned out, in their

4. "Newl Planter male 67 11rep. is not described in Johnson's Flora."

The few summer in the sun coast of the continent. A number of species are cut at 10 16 of 1171 or 1604, represent this species with tiny half round 1 26 1 m. In the distant 3 4, the thorns never quite even with the middle
of the space, sometime separable, sometime united, and to end forming
by the middle of the half where the separation of the veins is mostly
by a menudage of liver, or even not at all, the bollet being more
elated and broke than the medullar cortex.

Ig. 1611. The spines (fig. 1531, fig. 1231, and consider
1481) are perhaps referable to this genus; certainly I have apparently
found this species in spines of 1611 from No. (then 54), then
a fragment of bone bearing remarkable forms of vertices which
I have attributed not. The bolletes are placed in spiral order, all a short distance from each other.

I call, hand, chimerically, in length both, and I call them, on the
spine, certain, or pointed on the spine, with a most minute scale,
and the vertexes into part of the same large covering regular pattern of the
vertebrated appearance. (s) The whole structure is turned with short
applied lineuct to the leaf, the leaf, half an inch long, a million broad at the
base, the leaves more, generally marked on the third spine in the middle, none
till past all around the bollet, growing upwards. The structure is even
leading convex of the spine, of the leaf, the leaf twice, and appearing being
covered by the appearing scale, which for love, I am placed in without delay.

I conclude, all the space between the bollet. It is difficult to give a proper idea
of the appearance of the specimen which should be judged. Yet the
representative is not a representative, or to some new genus, of plant that
was

Ig. 1612. After the 1531, fig. 1231, after the 1481, fig. 1231, (fig. 1531, fig. 1231),
the bull, the one, or without. The structure is visible to represent the
spine. The spine is closely distinct on the leaf, narrow, flat, and the
copolitan. The spine, distinct 12 cent. wide for each, 12 centimeters, varied up

Ig. 1613. After the 1531, fig. 1231, after the 1481, fig. 1231, (fig. 1531, fig. 1231),
the bull, the one, or without. The structure is visible to represent the
spine. The spine is closely distinct on the leaf, narrow, flat, and the
copolitan. The spine, distinct 12 cent. wide for each, 12 centimeters, varied up

Newman.

Ig. 1611. After the 1531, fig. 1231, after the 1481, fig. 1231, (fig. 1531, fig. 1231),
the bull, the one, or without. The structure is visible to represent the
spine. The spine is closely distinct on the leaf, narrow, flat, and the
copolitan. The spine, distinct 12 cent. wide for each, 12 centimeters, varied up

Ig. 1612. After the 1531, fig. 1231, after the 1481, fig. 1231, (fig. 1531, fig. 1231),
the bull, the one, or without. The structure is visible to represent the
spine. The spine is closely distinct on the leaf, narrow, flat, and the
copolitan. The spine, distinct 12 cent. wide for each, 12 centimeters, varied up

Ig. 1613. After the 1531, fig. 1231, after the 1481, fig. 1231, (fig. 1531, fig. 1231),
the bull, the one, or without. The structure is visible to represent the
spine. The spine is closely distinct on the leaf, narrow, flat, and the
copolitan. The spine, distinct 12 cent. wide for each, 12 centimeters, varied up

Ig. 1614. After the 1531, fig. 1231, after the 1481, fig. 1231, (fig. 1531, fig. 1231),
the bull, the one, or without. The structure is visible to represent the
spine. The spine is closely distinct on the leaf, narrow, flat, and the
copolitan. The spine, distinct 12 cent. wide for each, 12 centimeters, varied up

Ig. 1615. After the 1531, fig. 1231, after the 1481, fig. 1231, (fig. 1531, fig. 1231),
the bull, the one, or without. The structure is visible to represent the
spine. The spine is closely distinct on the leaf, narrow, flat, and the
copolitan. The spine, distinct 12 cent. wide for each, 12 centimeters, varied up

Ig. 1616. After the 1531, fig. 1231, after the 1481, fig. 1231, (fig. 1531, fig. 1231),
the bull, the one, or without. The structure is visible to represent the
spine. The spine is closely distinct on the leaf, narrow, flat, and the
copolitan. The spine, distinct 12 cent. wide for each, 12 centimeters, varied up

Ig. 1617. After the 1531, fig. 1231, after the 1481, fig. 1231, (fig. 1531, fig. 1231),
the bull, the one, or without. The structure is visible to represent the
spine. The spine is closely distinct on the leaf, narrow, flat, and the
copolitan. The spine, distinct 12 cent. wide for each, 12 centimeters, varied up

Ig. 1618. After the 1531, fig. 1231, after the 1481, fig. 1231, (fig. 1531, fig. 1231),
the bull, the one, or without. The structure is visible to represent the
spine. The spine is closely distinct on the leaf, narrow, flat, and the
copolitan. The spine, distinct 12 cent. wide for each, 12 centimeters, varied up

Ig. 1619. After the 1531, fig. 1231, after the 1481, fig. 1231, (fig. 1531, fig. 1231),
the bull, the one, or without. The structure is visible to represent the
spine. The spine is closely distinct on the leaf, narrow, flat, and the
copolitan. The spine, distinct 12 cent. wide for each, 12 centimeters, varied up
FOSSIL PLANTS.

Syringodendron cyclostigma, Brgt.

Hist. Veg. Foss, p. 480, Pl. 166, fig. 2 and 3.

Found at Alton, by Mr. H. A. Green.

Genus SIGILLARIOIDES, Lesq. x.

Cylindrical roots or stems? variable in size, marked on the surface either by round scars, without trace of a central vascular point, placed in a regular quincunxial or spiral order, or by defined Sigillarioid cicatrices with a central vascular point, without any regular order of position in relation to each other. To this genus are referable the remains of what I consider as roots of Sigillaria.

Sigillarioides radicans, Sp. nov.

Pl. xxxi, fig. 4.

Primary axis cylindrical, about one inch broad, irregularly inflated and strangulated towards the narrower base, bearing long tubular rootlets or leaves attached to rhomboidal cicatrices, which are narrowed on both acute sides, and marked in the middle by a broad vascular point; leaves or rootlets more than one line broad, marked in the middle by a vascular line or medial nerve. The scars are tolerably distant, and without any regularity of position relatively to each other. Though slightly variable in their form, they are so remarkably similar to those of Sigillaria monostigma, that the intimate relation of these remains cannot well be doubted. This specimen is interesting, especially as seemingly indicating a similarity of scars between some species of trees of the Coal Measures and their roots.

Mazon creek; in clay iron-stone nodules.

—57
Sigillarioides stellaris, Sp. nov.

Pl. xxi, fig. 3.

Stem cylindrical, half a foot in diameter, irregularly inflated and contracted, obliquely crossing the shale, marked on its surface by small, round, slightly angular, sometimes nearly square or triangular cicatrices, in exact quincunxial order. These are slightly upraised above the surface, truncate, without trace of vascular point. Surface obscurely wrinkled between the scars, with lines diverging starlike toward the nearest cicatrices.

This beautiful specimen, figured half its size, evidently represents part of a root of a large Sigillaria. Its oblique position in the shale is marked by the upper and lower flattened surface, to which the direction of the stem is at an angle of thirty degrees. The inflation and contraction of the cylinder, which is irregularly strangulated, indicates also a tree's root. The scars placed in regular order, though double the size marked in the figure, are much smaller than cicatrices of Stigmaria. In the strangulated part of the cylinder, some of these cicatrices are deeply immersed in the stone, and do not show, any more than those which are slightly upraised above the surface, any trace of a mammilla or central point. The wrinkles of the surface and their direction resemble those of Stigmaria anabathra var. stellaris, Gopp.

Found in the roof shale of the coal at Morris; by Mr. Jos. Even.

Genus Halonia, Ll. and Hutt.


This genus represents aborescent stems bearing two kinds of cicatrices; small ones, like round or rhomboidal points closely approached, disposed in regular spiral order around the stem; large ones more distant, upraised like half round, obtuse tubercles, disposed about in quincunxial order.
When the museum has only the pieces which I have taken, as it would be an easy task to see the fragments in their correct position, I can view them as whole specimens. However, as I have only a few pieces, the pieces that I have taken have been carefully packed and labeled. The fragments can be studied, with the help of the objects, to form a complete picture of the specimen. The museum is open to the public, and I encourage visitors to come and see the specimens for themselves.

Galeodactylus? Pecier. Specimen from Loc. H31 represents a branch-like that of an H. Hornerin or Modedactylus. It is quite flattened, 7.3 cm broad, marked in the middle and near both sides, by regular circular scars, the outside of fracture 22 mm broad, elevated in the middle of the branch marked by a distinct circular umbilicus 6 mm diameter with a deep depression or hole in the middle and no trace of a central point. The distance from center to center of the depressions is 4 mm. The distance between the outer and inner sides of the outside undisturbed portion is 17-18 mm between.

The branch is indistinguishable and apparently of the same form as a Modedactylus min. This specimen is formed of a small piece of clay, marked with a regular circular depression and a central point. The specimen is 7.3 cm broad, and marked on both sides, by regular circular scars, the outside of fracture 22 mm broad, elevated in the middle of the branch marked by a distinct circular umbilicus 6 mm diameter with a deep depression or hole in the middle and no trace of a central point. The distance from center to center of the depressions is 4 mm. The distance between the outer and inner sides of the outside undisturbed portion is 17-18 mm between.

H. Hornerin. At Loc. H31, specimen No. 367, represent a small branch, positively referable to H. Hornerin. It is 7.3 cm broad, marked in the middle and near both sides, by regular circular scars, the outside of fracture 22 mm broad, elevated in the middle of the branch marked by a distinct circular umbilicus 6 mm diameter with a deep depression or hole in the middle and no trace of a central point. The distance from center to center of the depressions is 4 mm. The distance between the outer and inner sides of the outside undisturbed portion is 17-18 mm between.

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Halim's tuberculate.  

1. Halim's tuberculate.  Fig. 2 in more comparable to ours than that of Nutt. The tubercle appears a round mass in the cellule, as Command others in 1. The 

2. The tubercle appears to be the same as those represented in the Aggregates of blue and green tubercles, found in common in the Anthracites of Penn. I have seen them often and considered them generally as tetrada. Gopall found them in a talus upon the north of some trees, both of which see.  

3. Galt. 4. 6, and very irregularly oval, often on side, narrowed on the other side, 6

4. I have seen black bands in a few years from W. Gald. 4. 6. which present the character of the tubercle, as figured  

5. Galt. 4. 6. and 4. 7. fig. 1. the talus in a talus much longer, from 4. 6. and very irregularly oval, often on side, narrowed on the other side, 6

6. I have seen black bands in a few years from W. Gald. 4. 6. which present the character of the tubercle, as figured  

7. Galt. 4. 6. and 4. 7. fig. 1. the talus in a talus much longer, from 4. 6. and very irregularly oval, often on side, narrowed on the other side, 6
Hymenura (p. 1) specimen of B. Somewhat larger than they are generally and do not resemble in habitat or number: glycidicus, as species of this group, is somewhat smaller than the specimens here described, and therefore more easily recognizable by its fleshy, pinkish coloration. The species is very similar to H. virgatipes, but differs in its more distinct and regular ridges on the specimen to be described.
FOSSIL PLANTS.

Halonia tuberculata? Brgt.

Pl. xxix, fig 1.

Stem about three inches broad, flattened by compression to one inch, bearing large, round, elevated tubercles, hollow in the middle, or funnel-shaped, with a round convex point or small mammilla in the center. The specimen is not only decorticated, but corroded by sulphuric acid, and nothing is seen of the cicatrices between the tubercles but irregular, undulate wrinkles, crossing each other without any definite direction. The hollow tubercles look like large cicatrices of *Stigmaria*.

As the tubercles of the species of *Halonia* have never been described hollow in the center, our plant is doubtfully referred to it. The deterioration of the surface has evidently not produced the cavities of the tubercles, for the internal surface is smooth, regularly inclined downwards, bearing at the bottom a discernible vascular scar, similar to that of a *Stigmaria*. This species may be a *Stigmaria*, though the cicatrices are at least double of those of *S. unbonata*, Lesq.

From the Chester group, Pope county.

Genus STIGMARIA, Brgt.


Stigmaria elliptica, Sp. nov.

Pl. xxix, fig. 2.

Stem thick, half a foot broad, flattened to one inch; cicatrices placed in regular spiral quaternate order, elliptical, more or less elongated and proportionally narrow, with a central nearly round, small mammilla, marked in the middle by a vascular point. The specimen is covered with a thin coat of coaly matter, which has filled the scars, where it has an increased thickness, obliterating generally the mammillae. These
are, however, distinguishable at the bottom of some cicatrices. Their size is proportionally small. The species is perhaps referable to some of the numerous varieties ascribed by authors to *Stigmaria ficoides*.

Prof. Goppert (*Flora des Übergangsgebiryes*, p. 246, pl. xxxii, fig. 3,) has published as *S. ficoides* var. *elliptica*, a specimen apparently decorticated, with oblong, elliptical and unequal cicatrices. These, by their irregularity of form, size and position, evidently belong to a species different from ours. The same author, in his *Gattungen Liv. I, 2*, pi. xv, fig. 49, shows part of the stem of a *Stigmaria ficoides*, whose cicatrices, taken from within the cylinder, are elliptical, while those on the surface are round. But in the specimen here figured we have the true cicatrices of the cortex. I do not think it advisable to enumerate and describe the different forms of *Stigmaria* as mere varieties of the same species. The vegetable remains described in the next genus, demonstrate that even the roots of plants of the Carboniferous age are distinguishable by peculiar forms and peculiar cicatrices. It is my belief, the genus *Stigmaria* does not represent tree roots, but floating stems, of which species of the genus *Sigillaria* constitute the flowers or fruit-bearing stems; the difference in the form, the size, and the relative position of the scars ought to be admitted as specific characters in the same manner as for the species of the genus *Sigillaria*.

Duquoin; shales over the main coal.

**Stigmaria umbonata, Lesq.**

Geo. Rept. of Penn., p. 870.

I refer to this species remains of a *Stigmaria* found in abundance in the shales of the coal at Colchester, where the leaves are seen in connection with the stems. The cicatrices of the stems are of much larger size than those of *Stigmaria ficoides*, and the flattened leaves are twice as broad, measuring half an inch or more in diameter.

**Genus STIGMARIOIDES, Lesq.**

The species referable to this genus, very variable in form, tuberculose, or globular, or cylindrical, are apparently tree roots or *rhizomas*. They have, as common characters, round,
19. 
Hymenocallis triangularis procera. A rosette with 28 leaves, smooth, 
wide in regular order. 3 millimeters wide, at the base, which is 
below the rosette forming a leaf, broad pointed, smooth, slightly 
invaginated, with a straight edge, 
about 1 millimeter wide. The stem is 0.2 centimeters. Nothing 
was seen for floral structures. 

May be the same species. Hymenocallis 
Analis's sub. 

10. 
Hymenocallis anomala. 

A large, medium flattened stem, the central part 
without the leaves imbricated by rows diverging parallel to the border. 
The leaves on one side appear incised with leaves of Hymenocallis. 

21. 
Hymenocallis with leaves. 

A large, medium flattened stem, the leaves imbricated by 
rows diverging parallel to the border. The leaves 
on one side appear incised with leaves of Hymenocallis. 

20. 
Hymenocallis. 

A large number of rosettes, 
with leaves regularly placed around a stem, which is divided into 
three parts, sometimes slightly, curved leaves is the length, 
without midrib and appears like a rosette of leafy leaves 
without midrib of leaves. 

These leaves vary in breadth from 7 millimeters to 5 centimeters, 
and are here and there massed in the formation of rosette 
with irregular shape. These leaves are much like the leaves of Hymenocallis 
regular, and this species is also referred to as leaves of Hymenocallis. 

18. 
Hymenocallis s. villarum. (C. Christ). 

17. 
Hymenocallis (species). 

In the Museum of New York 
New Jersey represents a Hymenocallis. 

16. 
Hymenocallis. 

A large, triangular stem, 
standing in the Museum of New York. 

15. 
Hymenocallis species. 

A large, triangular stem, 
standing in the Museum of New York.
1. The pigment, enclosing the entire body, is sometimes in the form of a narrow, dark, elongated cylinder. The head is more or less rounded, and the tail is often distinctly visible. The body is covered with a thin, transparent membrane, which sometimes folds over the head and tail. The pigment is usually black, but in some cases it may be green or yellow.

2. The pigment is composed of small, oval, black cells, which are arranged in a regular pattern. The pigment is not uniform in thickness, and it may be thickened in certain areas. The pigment is not visible through the skin, but it can be detected by the transparent membrane.

3. The pigment cells are surrounded by a thin, transparent membrane, which is composed of small, oval, black cells. The pigment is not uniform in thickness, and it may be thickened in certain areas. The pigment is not visible through the skin, but it can be detected by the transparent membrane.
I. Sigmacaria borealis, Sieb. From China, we have a fine species, 1.28 which is exactly like the species figured in the Act. 331 pl. 2, being only larger. The primary axis is 15.5 mill. wide, marked round, and one central point just below it. The branch, 6.5 mill. at one end is cut at an angle for branch-inserting, and its lower, the primary axis, is marked by the same kind of leaves more irregularly in rank. One of these branches, 1.28 of these have about upon the same lower, running in distance from 5 to 10 mill. spaces thus one middle word with a striking central cylindrical leaf or point. The branch, however, have no trace of medial row. They are small in the central axis regularly, narrow, and slightly round. The Specim. 1.28 appears to represent the same species, one branch only whose divisions are narrower, subdividing in linear-rounded horizontal branches nearly one mill. with little division. The figure, not give the same kind of row, 1.28 with this branch with leaves divided in row, 1.28 of these leaves 1.28 to the same.

2. Sigmacaria borealis, Sieb. The same as described and figured in Act. 331 pl. 2. It shows the leaf and a still larger part of stem joined to it. The leaf is cylindrical with small curving papilae. The axis appears to grow in row, then lengths, and lastly enlarges.

3. Sigmacaria borealis, Sieb. The Specim. 1.28 is in the Museum. It do not have any other, and it is exactly figured and described in Act. 331 pl. 27/9.

4. Still a Specim. 1.28 of a species, which appears to be the same, with more regular, whole lengthwise, into a middle, narrow parallel unwinding, deeply constricted, distant leaf the small round, elevated leaflet, reach more than 1 mill. in diameter, and with a deep central point in the middle. This is the same as described in Act. 331 pl. 2. It shows the leaves of another 1.28 of a species, this which I have named to 1.28 in the Act. 331 pl. 27/9. The leaves are in regular spiral order, small, about 2 mill. broad, 15 centimeters distant, with a round and central basal teeth, upon 1 mill. surface of the stem.

5. Sigmacaria borealis, Sieb. The Specim. 1.28 of a species, which appears to be the same, with more regular, whole lengthwise, into a middle, narrow parallel unwinding, deeply constricted, distant leaf the small round, elevated leaflet, reach more than 1 mill. in diameter, and with a deep central point in the middle. This is the same as described in Act. 331 pl. 2. It shows the leaves of another 1.28 of a species, this which I have named to 1.28 in the Act. 331 pl. 27/9. The leaves are in regular spiral order, small, about 2 mill. broad, 15 centimeters distant, with a round and central basal teeth, upon 1 mill. surface of the stem.

6. Sigmacaria borealis, Sieb. The Specim. 1.28 of a species, which appears to be the same, with more regular, whole lengthwise, into a middle, narrow parallel unwinding, deeply constricted, distant leaf the small round, elevated leaflet, reach more than 1 mill. in diameter, and with a deep central point in the middle. This is the same as described in Act. 331 pl. 2. It shows the leaves of another 1.28 of a species, this which I have named to 1.28 in the Act. 331 pl. 27/9. The leaves are in regular spiral order, small, about 2 mill. broad, 15 centimeters distant, with a round and central basal teeth, upon 1 mill. surface of the stem.
small scars of rootlets, generally placed without symmetrical order, and without a central vascular point.

The affinity of this genus with the former appears at first very close; but we have here species, evidently roots, some of them rhizomes of ferns, marked by irregularly placed scars, which cannot be united to a genus which, even if it should represent a kind of roots, is far different in its essential characters, viz: the regularity of position and the form of the scars. The name of Rhizolites, P. Braun., a genus enumerated but not described by Unger, might be, therefore, appropriate if, per contra, the species had not a near relation to those of the former genus, by the form of the cicatrices and of the leaves.

All these species appear to have been of a soft substance, and without exception, have been found preserved in nodules.

**Stigmarioides truncatus, Sp. nov.**

*Pl. xxix, fig. 4.*

A cylindrical root, about one inch in diameter, with a smooth surface, marked with small round cicatrices, without order of position. These cicatrices vary much in size, and are evidently scars, left at the base of short, horizontal, flat rootlets, scarcely one line broad, without mark of a vascular line. The vascular point is also absent in the middle of the scars, or marked by a mere cavity.

This species resembles the one published in vol. ii of this Report, p. 448, pl. xxxix, fig. 9, under the name of *Stigmaria Evenii*, which has the surface undulately ribbed and broader scars, and is also referable to this new genus.

Found at Mazon creek, in concretions of argillaceous iron ore.

**Stigmarioides tuberosus, Sp. nov.**

*Pl. xxix, fig. 5.*

I do not know any vegetable organ to which these peculiar remains could be compared. The specimen figured represents a nearly round or square oval tubercle, with a convex surface covered with small round points irregularly placed, resembling scars of hairs or scales. In its upper part it is
strangulated or narrowed into a broad, tubulous, plaited leaf? or stem? resembling a large leaf of *Stigmaria*. It may indicate the first development of a rootstock, or represent a tubercle like those found at the end of the leaves of *Stigmaria*. It is marked in its upper part by a large round mammillate cicatrice, resembling also that of a *Stigmaria*. Its peculiar form cannot be considered as some casual deformation, as it is not only distinct in the middle of a concretion, but we have two specimens of exactly the same conformation. The one which is not figured has the leaf longer, and the tuberule slightly smaller.

From Mazon creek.

**Stigmarioides villosus**, Sp. nov.

Pl xxxi, fig. 1.

The form of this kind of tubercle is about the same as that of the former species, square, round in outline, appearing to have been cylindrical or inflated. Its surface is marked by two kinds of cicatrices: the one, numerous, punctiform, inflated, placed close to each other in irregular spiral order; the other much larger, auricular, with a mammilla and central point. The first look like scars of scales, the others like those of rootlets. This tubercle is, as seen on the figure, in close connection with a branch of *Pecopteris villosa*, Brgt.

But the union of both parts is not evident, for at its base the rachis is straight, and not curved to the root, by which the juxtaposition may be casual. Nevertheless the verrucose surface of the tubercle resemble so much that of the stem of the *Pecopteris villosa*, that it is scarcely hazardous to consider it as part of the rhizoma of this fern, and the same familiar juxtaposition of the same species of fern and the tubercle is marked upon the three specimens, which are all that have been procured as yet of this peculiar form.

Found at Mazon creek, in concretions of argillaceous iron ore.
Galton's relation of the genus. As seen from the figure on my plate 32, the
Galton can not be considered like the Neurachne in account of its fructification.
The same remarks apply also to Gilbert's Hypolyperis antennata, which is
a native of the West Indies and is remarkable for its slender body.
This is probably a new species, and its fructification is remarkable for
its form. The figure, with a few slight alterations, is taken from the
figure 32, and shows the form and the details of the plant. My plate 36,
which I have carefully examined, shows that the species is usually
found in the following order: Fig. 1. The upper figure represents the
Galton, with its slender body and long tail. Fig. 2. The same as Fig. 1,
but with the tail replaced by the upper figure. Fig. 3. The same as Fig. 2,
but with the tail replaced by the lower figure. Fig. 4. The same as Fig. 3,
but with the tail replaced by the upper figure. Fig. 5. The same as Fig. 4,
but with the tail replaced by the lower figure. Fig. 6. The same as Fig. 5,
but with the tail replaced by the upper figure. Fig. 7. The same as Fig. 6,
but with the tail replaced by the lower figure. Fig. 8. The same as Fig. 7,
but with the tail replaced by the upper figure. Fig. 9. The same as Fig. 8,
but with the tail replaced by the lower figure. Fig. 10. The same as Fig. 9,
but with the tail replaced by the upper figure. Fig. 11. The same as Fig. 10,
but with the tail replaced by the lower figure. Fig. 12. The same as Fig. 11,
but with the tail replaced by the upper figure. Fig. 13. The same as Fig. 12,
but with the tail replaced by the lower figure. Fig. 14. The same as Fig. 13,
but with the tail replaced by the upper figure. Fig. 15. The same as Fig. 14,
but with the tail replaced by the lower figure. Fig. 16. The same as Fig. 15,
but with the tail replaced by the upper figure. Fig. 17. The same as Fig. 16,
but with the tail replaced by the lower figure. Fig. 18. The same as Fig. 17,
but with the tail replaced by the upper figure. Fig. 19. The same as Fig. 18,
but with the tail replaced by the lower figure. Fig. 20. The same as Fig. 19,
but with the tail replaced by the upper figure. Fig. 21. The same as Fig. 20,
but with the tail replaced by the lower figure. Fig. 22. The same as Fig. 21,
but with the tail replaced by the upper figure. Fig. 23. The same as Fig. 22,
but with the tail replaced by the lower figure. Fig. 24. The same as Fig. 23,
but with the tail replaced by the upper figure. Fig. 25. The same as Fig. 24,
but with the tail replaced by the lower figure. Fig. 26. The same as Fig. 25,
but with the tail replaced by the upper figure. Fig. 27. The same as Fig. 26,
but with the tail replaced by the lower figure. Fig. 28. The same as Fig. 27,
but with the tail replaced by the upper figure. Fig. 29. The same as Fig. 28,
but with the tail replaced by the lower figure. Fig. 30. The same as Fig. 29,
but with the tail replaced by the upper figure. Fig. 31. The same as Fig. 30,
but with the tail replaced by the lower figure. Fig. 32. The same as Fig. 31,
but with the tail replaced by the upper figure. Fig. 33. The same as Fig. 32,
but with the tail replaced by the lower figure. Fig. 34. The same as Fig. 33,
but with the tail replaced by the upper figure. Fig. 35. The same as Fig. 34,
but with the tail replaced by the lower figure. Fig. 36. The same as Fig. 35,
but with the tail replaced by the upper figure. Fig. 37. The same as Fig. 36,
but with the tail replaced by the lower figure. Fig. 38. The same as Fig. 37,
but with the tail replaced by the upper figure. Fig. 39. The same as Fig. 38,
but with the tail replaced by the lower figure. Fig. 40. The same as Fig. 39,
but with the tail replaced by the upper figure. Fig. 41. The same as Fig. 40,
but with the tail replaced by the lower figure. Fig. 42. The same as Fig. 41,
but with the tail replaced by the upper figure. Fig. 43. The same as Fig. 42,
but with the tail replaced by the lower figure. Fig. 44. The same as Fig. 43,
but with the tail replaced by the upper figure. Fig. 45. The same as Fig. 44,
but with the tail replaced by the lower figure. Fig. 46. The same as Fig. 45,
but with the tail replaced by the upper figure. Fig. 47. The same as Fig. 46,
but with the tail replaced by the lower figure. Fig. 48. The same as Fig. 47,
but with the tail replaced by the upper figure. Fig. 49. The same as Fig. 48,
but with the tail replaced by the lower figure. Fig. 50. The same as Fig. 49,
but with the tail replaced by the upper figure. Fig. 51. The same as Fig. 50,
but with the tail replaced by the lower figure. Fig. 52. The same as Fig. 51,
but with the tail replaced by the upper figure. Fig. 53. The same as Fig. 52,
given to them an appearance of uncinate ventricle. But that's a new appearance for a few only of the lower branches, having the arc, convexity, etc., in which the upper three branches. I have seen a somewhat elongated, almost a main, stalk and the 4-5 a common branching. The upper, or back, is ornamented with five or more leaflets, the upper leaflets are ornamented with a character indicated by references to the tegumen. But the added adjust a character which is not present in the joint species. In two small species, the able to Galapagos, I think the penultimate leaflet is concave and appears at the base slightly enlarged and not embracing. If the 6. 2. 1. of M. 1. y. v. then the mode of attachment of the penultimate leaflet, just as it is marked upon them, that the leaflet appears somewhat as a point on the application of the upper leaflets along the side of the inner leaflet, that this point is marked flat and an edge never exceeds then a then by a narrow deep line in the middle. In one + 6. 0. 9. I have distinctly seen some of the processes, similar to the base, which is apparently made up of the base, a direction perpendicular to the natural of a normal one. Fig. 6. 1. should have been seen embracing as far as, the edge of the leaflet. In the lower leaflet, which is straight, there is not seen to be really when in contact to the edge, it is slightly elongated or flattened — as in the leaflet 6. 0. 9. fig. 6. Some of the vessels of the penultimate leaflet is seen to be much in common and which goes, like all others, into the middle. The edge, being not exactly marked in the middle, but a deep line (shown figured) instead of the joined (the leaflets) both having of the leaflets, which sometimes, as said above, seem divided but is not.
Stigmarioides linearis, Sp. nov.

Pl. xxxi, fig. 2.

A long, linear, cylindrical root, half an inch thick, slightly tapering downwards, obtuse at the base or broken, bearing narrow linear leaves or radicles one line broad, without medial nerve, leaving at their point of attachment small round cicatrices, placed without order and without visible central point. The rootlets or the first divisions of the root are also marked with round scars, fig. 2a, indicating a subdivision similar to that which is sometimes observable on leaves of Stigmaria.

Found at Mazon creek, in concretions.

Stigmarioides affinis, Sp. nov.

Pl. xxvii, fig. 9.

This species, represented by two specimens, appears intermediate between S. tuberosus and the following. It has a short cylindrical base, divided like a root in branches, tending obliquely downwards and diminishing to a point. This part, about one inch long, is covered with horizontal, half an inch long linear narrow scales, or by their scars, in the form of sharply elevated points. From its slightly strangulated col-lum, or top, it abruptly passes into a broad linear flat leaf or blade, marked on each side by two obsolete lines resembling nerves. Its surface is equally marked with distant points, basilar scars of scales, a few of which are still seen on its borders. These borders are straight, sharp, well defined, like those of a leaf of Lepidodendron, and the surface is minutely and irregularly striate lengthwise.

Found in the concretions of Mazon creek; by Mr. Jos. Even.
Stigmarioides selago, Sp. nov.

Pl. xxxi, fig. 3 and 3b.

An apparently cylindrical branch or root, whose essential axis, about half an inch thick, is tapering downwards, dichotomously forking, covered with long, narrow, linear hairs or scales (fig. 3b enlarged), bearing from the end of the divisions long, hard, quadrangular, tubular, thick, naked leaves?, with a thick, medial, vascular vein, and a narrowly striated surface.

These leaves or roots are similar in form to those of Lepidodendron, but much longer. The figure exactly represents the specimen, which is finely preserved in the middle of a concretion. But the union of these hard, smooth, cylindrical leaves with a stem or root entirely covered with hairs, and from the point of alternate divisions, is so peculiar, that nothing among fossil or living vegetables, that I know, can be compared to it. It is uncertain whether these hard leaves represent rootlets of some kind, or root-stalks or leaves, and possibly the specimen may be figured the wrong way. By its straight, horizontal, narrow, linear hairs, the part of the stem which bears them resembles the species published in vol. ii, of this Report, p. 446, pl. xli, fig. 3, under the name of Selaginites uncinnatus (1).

In a concretion from Mazon creek.

(1) Under the name of Rhizomopteris, Prof. Schimper has published, loc. cit., p. 699, two species formerly referred to Selaginites, one of them, S. uncinnatus, Lesq., III. Geol. Rep., p. 446, pl. xli, fig. 3, which he considers as rhizomas of ferns. These two last species of ours should be referred to the same genera. Rhizomopteris (Selaginites) Raymondii, Germ., has been found in the concretions of Mazon creek in well preserved specimens.

2. *Mycolites* Janichellides? (or another name) nec. proprius. Germ. am. porcell. sud. mol. than the division. Primarily divided in alternate branches or leaves. 16 1/2 million m. in the medulla, three branches. Secondary divisions alternated at the third division. No trace of stria. The species looks somewhat like a Janichella in its mode of division. It is thus apparently being reposed in a reducible pellicle which separate easily. The specimen represent

3. **Chryseostoma cylindricum.** Under this name I have put together a number of specimens which may represent some species of *Chryseostoma* but which can not be easily characterized.

If Agmatocampa Mettmani, Gopp. Pa. 33, a moth long brand, covered by the tush, furred, is free whose surface is smooth but distinctly fringed or marked by distinct though very shallow furrows, and by those knobs, present, when the tush is destroyed and whose form is then understood. They compare to Gopp. species which is from the triangular formation of Canada it is not found identifiable.
1. Megaphyton. At day’s end, an splendid specimen though bearing only one
was obtained for the Museum from Dr. Hands at Morris (W. Y. 71). It was more
slender than the form of the scale than the one published in the 31st vol of this
report. The outline of the scale is round about 5 1/2 inches long on a little more by
3 inches broad. The water very fine in pitch broad slightly narrowed downward,
waits upwards and downwards, into the canal or medial blade which separates
the two lakes. All the surface of the scale, besides, leaves it bare covered with
well marked points irregularly placed. The scale has here apparently lengthened
form, the scale being isolated and not crowded and compressed at both ends,
that in three inches above and below the scale where the form is 5 1/2 inches without
any other trace of scale (1. 6 71). Morris, N.Y.

2. Megaphyton Goldenberg’s from S. America, is not
very much differen[t] in bladder and tail. The bladder is an only much
oldest n and is the 2nd to last, the form of the scale is about to
the scale of this form abnormal as separate in the manner given,
and where the form join and male’s continuation, form
male already by the 5 of the form. It has bome on
much longer, the male’s form is generally
only the internal form without, but with the ventral
bottle, the external form is not, in 1771 the female ends only in forma-
the 5 form is not amplified.
Geyser Cantontin. Grand Entry (Dept Mem. p. 6) and the Grand entry can not be separated from the Cantontin. And the Grand entry should be established in Flyshieren, with Paul, marazic, car and a few others.
FOSSIL PLANTS.

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STEMS OF FERN TREES.

GENUS CAULOPTERIS, Ll. and Hutt.


CAULOPTERIS OBTECTA, Sp. nov.

Pl. xxviii, fig. 1 to 4.

Stems of small size, varying in thickness from four to six inches, entirely covered with long, linear, cylindrical, aerial rootlets, attached to it without relative order of position, bearing at their base an elongated oval scar. Branch scars distant, oval obtuse at both ends, two to three inches long, one to one and a-half inches broad, marked lengthwise by broad striae, or marks of aerial roots. The rootlets are regularly cylindrical, one foot long or more, apparently tubulose, without trace of a medial vascular line, closely appressed to each other, and upon each other in the same downward direction, and so entirely covering the stem that their cicatrices are rarely distinguishable. The branch scars are distant, as seen figs. 1 and 2, which show both sides of the same part of a stem, and indicate the relative position of the scars. The order of position appears to be as one to four, but is obscured by the flattening of the stem, whose thickness is, by compression, reduced to one inch at the upper part, and to two inches at the lower part. A branch scar and part of stem are figured, natural size, fig. 3. The distance between these branch scars is so great, especially toward the base of the stem, that a number of specimens, some as large as one foot square, were collected at Colchester, and, though closely scrutinized, did not show any trace of them.

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These specimens are generally flattened to less than one inch in thickness, as if the stem had been of a soft texture. Generally the coat of superposed radicles is transformed into a pellicle of coal and these are marked on their surface by very thin parallel striae, perceptible only with a strong glass. This coating of radicles upon the stem of a fern has nothing peculiar in it, as some fern trees of our time show the same kind of conformation. One species, *Polypodium armatum*, Swartz, from Brazil, is figured in Sternberg's Vers., vol. i, pl. E. But from the Coal Measures we have as yet nothing analogous to this species.

The beautiful stem represented, figs. 1 and 2, is from the shale of Morris, and belongs to Mr. Jos. Even, who kindly furnished me with splendid photographs of it.

**Caulopteris acantophora**, Sp. nov.

The species is represented by numerous specimens, some of them of large size, all of the same appearance. Their surface, either naked or coated with a pellicle of thin coaly matter, is marked by irregular elevated points, placed without regular order, evidently the basilar scars of spines, with which the branches or stems were covered. On the large specimens no trace of branch scars was discernible, but the oval line, marked fig. 3, running parallel to a broad depression seen at the corner of the figure. It is a kind of deep convexity in the shale, with smooth, irregular borders, resembling rather the impression left by the sides of a nodule than a branch scar.

Fig. 4 represents a branch of this species, apparently at least, for it has the same kind of cicatrices exactly on the surface, and still bears on its borders some of the hooked spines by which they are produced. The branch is attenuated into a conical point of attachment which does not resemble that of a branch of *Caulopteris*, and is also marked in the middle by a scar which, per contra, has the form of the branch scars of a fern. These specimens, all flattened, are therefore probably only referable to this genus.

It abounds, like the former species, at Colchester, and is also found at Morris.
1. Palaeoptera, a cantorphor is, of this species a specimen was obtained from the 1st gill, 620, and from the 2nd one, which shows the form of the head and seems to indicate it as probable to some new genus. These stay an actual, not more than one fourth in each long, cold, elongate, and 5" or 6" in breadth, surrounded by a slightly expanded term not quite of an inch broad, smooth or without trace of point. They are placed at a slight distance of about one inch to each side and approached by two or three slimy, not iridescent, relative figures. The size of these seeds would agree very well with the known size of the branch with which it may.
1. Perhaps a stern of form. Here, at 363 ft. 17\(\frac{3}{4}\) in. at a distance of about 32 ft. The articulations are slightly rough, but the eye of the umbral which appears deep is not the use of the animal. They are about to go in a segment of a circle or in a straight line, or in a slightly curved chord, and then to go in a circle. This may be referred to a large antipatharian, a large mass, or a small branch of a larger one.

2. Hemipyralis. Manhalta. They are round. The specimen is 32 ft. long. Next, 25\(\frac{1}{4}\) in. or slightly more. The specimen is 30\(\frac{1}{2}\) in. in the form of a disk at the top. The specimen is 30\(\frac{1}{2}\) ft. long. A group of animals close to each other, forming a circle, marked at the top by a large central disc. The specimen is 25\(\frac{1}{2}\) in. long. A large mass, which appears deep is not the use of the animal. They are about to go in a segment of a circle or in a straight line, or in a slightly curved chord, and then to go in a circle. This may be referred to a large antipatharian, a large mass, or a small branch of a larger one.

3. Canopy. Fish. The surface of the water is smooth and the direction of the water. The specimen is 32 ft. at a distance of about 32 ft. The articulations are slightly rough, but the eye of the umbral which appears deep is not the use of the animal. They are about to go in a segment of a circle or in a straight line, or in a slightly curved chord, and then to go in a circle. This may be referred to a large antipatharian, a large mass, or a small branch of a larger one.
An interesting and unusual fish, **Acanthomycterus cristatus**, was recently described by Dr. John D. Doherty. The fish was found in a small stream in the mountainous region of southwest Asia. It is a member of the family Cephalophallaceae, which is characterized by a unique head structure resembling a ball of thorns.

The fish has a distinctive body shape, with a streamlined silhouette that allows it to glide effortlessly through the water. The scales are small and tightly packed, providing excellent camouflage. The fin structure is particularly interesting, with a series of elongated, needle-like extensions that give the fish a distinctive appearance.

The **Acanthomycterus cristatus** is a solitary species, typically found in clear, fast-flowing streams. It is primarily herbivorous, feeding on aquatic plants. The eggs are laid in clusters on rocky substrates, and the larvae hatch within a few days. The young fish are also carnivorous, gradually transitioning to a diet of small invertebrates as they grow.

Despite its unusual appearance, the **Acanthomycterus cristatus** is not considered a threat to biodiversity, and its population appears to be stable. However, further research is needed to fully understand its ecological role and conservation status.

In conclusion, the **Acanthomycterus cristatus** adds to the rich diversity of the world's freshwater ecosystems. Its unique features make it a captivating species for both aquarium enthusiasts and marine biologists alike.

 References:


Dr. Caulopterus Calif. Dpt. Another specimen of species. 1712. has the body, a general zone, in a dimpled 4 cent. long. 11 mill. broad in the metastome oral with a distinct hour glass formed line on it the shape of the body vertical. declinate 6 cent. naugard 3/4 with analulate. There strongly marked butire and a smooth teat below terminating in part at the tip of the lower scar.

Dr. Caulopterus. Par. 113. Boblens near womer, circular, broadly oral 3 1/2 cent. long 27 mill. nose. rib cord and horres tally equally divided. Hypo of the jaws and horn like distance between the deeply irregular teeth on top 2/3 horizontal; 6 mill. by axes of lower teeth elongated to 4 1/2 mill. short and nicely remote are that the 2nd must be 3 cent. naugard, marked by the longitudinal slight undulate rectus. There ample and nanum like the third filament nearly half mill. thin. The form of the leaf scars have the shape and are seen obliquely through the filament, placed toward the upper part of the scar. See Fig. 14 of p. 546.
**Caulopteris intermedia, Sp. nov.**

Cicatrices elliptical, elongated, three inches long, a little more than one inch broad, narrowed downwards into a broad cauda, pointed at the top, irregularly ribbed or sulcate, with a central, elongated scar, and without definite marginal disc. Surface between the cicatrices apparently smooth, marked by points or mammillae about one-eighth of an inch broad, half an inch distant, placed in an irregular spiral order. The space between the cicatrices is horizontally one and a-half inches, and two inches in the direction of the spiral.

This species is known to me only by a sketch lately communicated by the State Geologist, and received after the preparation of the descriptive part of this Report, and the engraving of the plates. It appears to be intermediate between *Sigillaria Marodiscus*, Brgt., and *Sigillaria Cistii*, of the same author. The form of the cicatrices is about the same size as in the first of these species, but they are disconnected at the base, placed in true spiral order, and at some distance from each other, as in the last species. It is a true *Caulopteris*, according to Schimper's definition of the genus, while most of our species of *Caulopteris*, viz., those whose internal cicatrices are surrounded by a flattened border generally opening inwards in the form of a horse shoe, are referable to the genus *Stemmatopteris*, of Corda.

In sandstone, over coal No. 3, one mile south of Rushville, Ill.
FRUITS OR NUTLETS.

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GENUS TRIGONOCARPUM, Brgrt.


TRIGONOCARPUM NOEGERATHII, LI. and Hutt.

Pl. xxxi, fig. 16.

This fine fruit is cut in the middle by a section of a nodule which only represents its internal part and structure. As the outside form is not known, and the internal disposition is slightly different from that of the fruit published by Lindley and Hutton, vol. ii, pl. 142, our species is doubtfully considered as identical with the European one. This fruit has three distinct walls or envelopes. The external one, more than one line thick, looks like a fleshy, soft exocarp, the part which it occupies being of the same compound as that of the stone, merely changed in color and intermixed with small pyrites. Its form is exactly ovate-pointed, slightly emarginate at the point. The second wall, transformed into crystallized iron, is irregular in thickness, ascends, first as high as the point of the central receptacle, where it divides, one part uniting both borders, the other ascending near to the point where it is joined in an obtuse top. The third envelope, as thick as the first, ascends to the point c, and is a compound of a black substance mixed with fibrous tissue. The internal nut is of a spongious compound like the third envelope, but is marked with more numerous, yellowish filaments, directed longitudinally, and irregularly broken across. Its point seems ascending into the first wall of the whole fruit. The English authors compare the fruit to that of a palm, and recognize in the middle of it, the place of the embryo, a depression which is not seen in ours.

Found in a concretion of Mazon creek, by Mr. Jos. Even, to whom the specimen belongs.

TRIGONOCARPUM OLIVÆFORMIS, LI. and Hutt.

Foss. Fl. 3 t. 222, fig. 1 and 2.

Collected from the sandstone of Eugene, Ind., by Mr. John Collett.
9. Patricia is a tough nut to crack. The solution is to try a different approach. If she is a bit sensitive, try being more direct. If she is more assertive, be softer and more subtle.

The golden rule is to always be respectful and understanding. It is important to listen to her feelings and concerns, and to be patient and empathetic.

In any case, it is important to remember that everyone has their own unique way of communicating, and it is best to try to understand and respect that diversity. By being open-minded and flexible, you can help to create a positive and supportive environment for everyone to thrive in.

10. Patricia is known for her strong work ethic and dedication. She is always willing to go the extra mile to get the job done, and is highly respected by her colleagues and superiors.

In addition to her hard work, Patricia is also known for her kindness and generosity. She is always willing to lend a helping hand to those in need, and is highly regarded for her compassion and empathy.

Overall, Patricia is an asset to any team or organization. Her dedication, hard work, and kindness make her a valuable member of any group, and she is respected and admired by all who know her.
2. Trigonoceras. Species Recent, 124. - 

3. Trigonoceras. Species Recent, 124. -
Cardiococcus multiplex in loc. N. 176. 2793. 2794, 2795 of lachne. A little longer than broad, 1 cent long about, the enlarged upwardly, marginal at the top with borders rounded both sides of the incrustation reduced small oral area at the upper part rounded below will one or two layers of envelope or surrounding it.

Cardiococcus Sparkell. L. 7. First 3. 33, fun specimens. Mol 140. -

Cardiococcus Brandie. T. 2.7. Fun specimens. Mol 140. -

Cardiococcus Sparkell. L. 7. First 3. 33, fun specimens. Mol 140. -

Cardiococcus Sparkell. T. 2.7. Fun specimens. Mol 140. -

Cardiococcus Sparkell. L. 7. First 3. 33, fun specimens. Mol 140. -

Cardiococcus Sparkell. L. 7. First 3. 33, fun specimens. Mol 140. -

Cardiococcus Sparkell. L. 7. First 3. 33, fun specimens. Mol 140. -

Cardiococcus Sparkell. L. 7. First 3. 33, fun specimens. Mol 140. -

Cardiococcus Sparkell. L. 7. First 3. 33, fun specimens. Mol 140. -

Cardiococcus Sparkell. L. 7. First 3. 33, fun specimens. Mol 140. -

Cardiococcus Sparkell. L. 7. First 3. 33, fun specimens. Mol 140. -

Cardiococcus Sparkell. L. 7. First 3. 33, fun specimens. Mol 140. -
Genus Rhabdocarpos, Gopp. and Bergr.

Fruits oval or cylindrical oblong, marked lengthwise on their surface by narrow equal striae.

Rhabdocarpos clavatus?, Sternb.

Pl. xxxi, fig. 11.

Our specimen much resembles the figure given of this species by Geinitz, in Versteinerungen, pl. xxii, fig. 13, though it is much larger than the fruit figured by Sternberg. The endocarp is about round, elongated upwards in a colhum resembling the neck of a bottle; its surface, which is somewhat convex, is a mass of coaly matter, cut across by deep wrinkles, caused by disruption; the exocarp surrounding it is about one line thick, of the same shape as the endocarp, but slightly enlarged at the point and funnel shaped. It looks of a harder texture than the internal fruit.

In a concretion from Mazon creek.

Rhabdocarpos mammillatus, Sp. nov.

Pl. xxxi, fig. 12 to 15.

A fine small nutlet, quite entire and separated from the stone. It is apparently of a hard texture, oval, marked on its surface by regular, distinct deep striae, running down from the borders of a smooth mammillate top to the base, as seen fig. 14 and 15.

The surface of the nut is a thin shell which, as seen from a small part which is detached, covers a hard, smooth fruit.

From Mazon creek, in concretions.
Genus CARPOLITHES, Sternb.


Carpolithes corticosus, Sp. nov.

Pl. xxxi, fig. 17.

A small flattened nutlet, oval, short pointed at one end, (the point turned on one side) and covered with a thin yellowish membranaceous pellicle. It is surrounded by a proportionately thick pericarp, having the same form, and being a compound of crystallized iron.

Mazon creek; in concretions.

Carpolithes persicaria, Sp. nov.

Pl. xxxi, fig. 18.

A small fruit, one-half of an inch long, only half as broad, oval elongated, pointed at one end, slightly emarginate at the other, with a thick exocarp, and an internal compound of the same form, but of a softer substance. The outer wall is preserved, while the internal part is nearly destroyed. It resembles a small kernel of a peach.

On shale found at Murphysborough; and poorly preserved.

Carpolithes vesicularis, Sp. nov.

Pl. xxxi, fig. 19 to 21.

This kind of fruit resembles a small bladder, which, by compression in various ways, has taken different forms. It is generally elongated, more inflated and obtuse on one side than on the other, cylindrical. Its surface is smooth, generally covered with a thin coating of coaly matter, marked with broad wrinkles and undulations, as in fig. 19. Fig. 21 shows a kind
1. Carpolithus notianus Lp. I find these plants in their trunks on some islands (of Long Island) collected at both ends of the island by Beaman, where they are about the size of my hands. The stems resemble a leaf of the plantain and are purple in form. They may be about 5 feet high. The flowers are white, and the petals are attached at the base of a yellow ovary, and a third of the pistil, with a thread-like column. They appear in pairs on the undersides of the leaves. The flowers are small, and the fruit is a black capsule with four seeds.

2. Carpolithus notianus Lp. malayanus in the plant, which is described in the main, and in the figure in the plate, also in the description of the plant, are very similar. The flower is a small, thread-like column, and the fruit is a small, black capsule.

3. Carpolithus notianus Lp. The figure in the main, and the description of the plant, are very similar. The flower is a small, thread-like column, and the fruit is a small, black capsule.

4. Carpolithus notianus Lp. The flower is a small, thread-like column, and the fruit is a small, black capsule.

5. Carpolithus notianus Lp. The flower is a small, thread-like column, and the fruit is a small, black capsule.
considered a Carpolithes, multibracteate, Tiber. They were one may notice only one species or perhaps few different ones, if they are placed with the other acrodonts, as above. 54 and 57. and then we are troubled with the figure of Carpolithes bifidus, p. 191. The peculiar is perhaps a new one and may be called bifidus. But there is probably already in the wrong way and from an incomplete description which not one hand now. The form of the figure is represented 3. 320. fig. 320. p. 101, 114. fig. 320. appear to be either first, surrounded with their bracts, the whole always turned to one side at least apparently so, fig. 320. p. 114. cut, and without any mark having turned the wrong way and the one apparently from being broken remains of the preparation. In the entire state the figure is somewhat old. Carpolithes bifidus, fig. 320. p. 114. 17. Carpolithes bifidus, p. 320. p. 114. 19. I have only a broken portion, counter part of the one figured above. This probably the alphabetical part of some sort, perhaps the internal measure of the form. It may be a copy of the plate in my p. 320. p. 114. 19. The figure is good. Compare it with description. This figure is evidently petrified, the petal very distinct and long than figure. I have calculated some preparing 307 another petal to 307 the kind. The figure shows a somewhat broader leaf 6 million mm. 2. and long when not measured in the whole, very brown brilliant and agreeably associated with a long, long, very regular and delicate nuce overwhelmed in its length. 18. Carpolithes bifidus, p. 320. p. 114. 19. I have somewhat broken nothing more included but what there broken in was possible. 19. Carpolithes, p. 320. p. 114. 19. This small species is very difficult to see, and as described in p. 320. p. 114. 19. with a calcite medulla and generally a thick narrow border which fills the radial plate in the state. 19. A little or a very minute form of C. Weidemannus, p. 320. p. 114. 19. 11. Carpolithes, p. 320. p. 114. 19. The description is not very clear, the number shows exactly the character of the genus, and p. 320. p. 114. 19. 15. Fig. 102. 12. There are figured p. 320. p. 114. 19. The leaf is thick. Consider other, one thing and remains distinct where it is long than the figure, it is not represented here in my figure and in one of them in form of the country deeply conical. Not mentioned in Weidemannus. Allow the kind of preparation here a concave part of the same appearance be found not logged only lightly pointed and lightly turned in form. The possibly and the species but the figures not just to it. I am not 12 with this figure matching preparation. It is apparently Carpolithes, the leaf can be assigned to January 7. Tab. 22. fig. 18. 13. Carpolithes, p. 320. p. 114. 19. The oral calciferous petal along in with both ends and backward in calciferous margins, still the same petal and without any part of the form from real large. May to reduce to the same form, p. 320. p. 114. 19. 13. Carpolithes, p. 320. p. 114. 19. The oral calciferous petal along in with both ends and backward in calciferous margins, still the same petal and without any part of the form from real large. May to reduce to the same form, p. 320. p. 114. 19. 13. Carpolithes, p. 320. p. 114. 19. The oral calciferous petal along in with both ends and backward in calciferous margins, still the same petal and without any part of the form from real large. May to reduce to the same form, p. 320. p. 114. 19. 13. Carpolithes, p. 320. p. 114. 19. The oral calciferous petal along in with both ends and backward in calciferous margins, still the same petal and without any part of the form from real large. May to reduce to the same form, p. 320. p. 114. 19. 13. Carpolithes, p. 320. p. 114. 19. The oral calciferous petal along in with both ends and backward in calciferous margins, still the same petal and without any part of the form from real large. May to reduce to the same form, p. 320. p. 114. 19.
15. The vegetable bullocks buy the flax at the consumer's price and sell it at the merchant's price. The flax is gathered in the spring and the vegetable sells it to the merchant. The merchant purchases it from the vegetable and sells it to the consumer. The price paid by the consumer is higher than the price paid by the vegetable. The difference between the two prices is the profit made by the merchant.

16. The merchant buys the flax at the consumer's price and sells it to the vegetable. The vegetable then sells it to the consumer. The price paid by the consumer is higher than the price paid by the vegetable. The difference between the two prices is the profit made by the vegetable.
1. Carpoditis bifida. The counterpart of the species described above is seen figure 7, p. 531. The fact is Conway, and indeed can be inferred from the oral view of the specimen, not immediately this species, is double the size of the last, with a small central dot surrounded by a definite line.

2. Carpoditis. In the same manner, as it is seen figure 8, p. 531, fig. 11. The fruit is nearly circular, slightly more elongated than circular, the two semi-circular bands, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

3. Carpoditis, claviceps. In figure 9, p. 531, fig. 12, 13, 14, the species of Cloveus, all have a small central dot surrounded by a definite line.

4. Carpoditis, claviceps. In figure 10, p. 531, fig. 15, 16, the species of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

5. Carpoditis, claviceps. In figure 11, p. 531, fig. 17, 18, 19, 20, these species are of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

6. Carpoditis, claviceps. In figure 12, p. 531, fig. 21, 22, 23, these species are of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

7. Carpoditis, claviceps. In figure 13, p. 531, fig. 24, 25, 26, 27, these species are of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

8. Carpoditis, claviceps. In figure 14, p. 531, fig. 28, 29, 30, these species are of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

9. Carpoditis, Mansfieldi, in the same manner, as it is seen figure 15, p. 531, fig. 31, the species of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

10. Carpoditis, Mansfieldi, in the same manner, as it is seen figure 16, p. 531, fig. 32, 33, these species are of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

11. Carpoditis, Mansfieldi, in the same manner, as it is seen figure 17, p. 531, fig. 34, 35, these species are of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

12. Carpoditis, Mansfieldi, in the same manner, as it is seen figure 18, p. 531, fig. 36, 37, these species are of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

13. Carpoditis, Mansfieldi, in the same manner, as it is seen figure 19, p. 531, fig. 38, 39, these species are of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

14. Carpoditis, Mansfieldi, in the same manner, as it is seen figure 20, p. 531, fig. 40, 41, these species are of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

15. Carpoditis, Mansfieldi, in the same manner, as it is seen figure 21, p. 531, fig. 42, 43, these species are of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.

16. Carpoditis, Mansfieldi, in the same manner, as it is seen figure 22, p. 531, fig. 44, 45, these species are of Cloveus, the black line upon these figures in the same plate, there are two other species, one half the size. These two species are of the same genus, with a more regular round, it is to remember with the two species following.
FOSSIL PLANTS.

of inflation or convexity, surrounded by a flattened border, resembling an endocarp and its exocarp. This form may be merely casual.

Morris and Murphysborough; abundant in the shales over the coal.

CARPOLITHES BULLATUS, Sp. nov.

Pl. xxxi, fig. 22 to 24.

An agglomeration of oval or round, small, wrinkled seeds, resembling vesicular spores, all nearly of the same size. Like the former, they appear to have been of a soft vesicular texture. Fig. 24 shows them enlarged.

In concretions from Mazon creek.
The surface of the stone transversely cut, is covered with them.

SIGILLARIAE? SEMINA, (Seeds of Sigillaria?).

Pl. xxxi, fig. 25, and 25a.

The concretions of Mazon creek contain agglomerations of small seeds, united into cylindrical-ovate clusters, about one inch long, nearly half an inch broad, obtuse at both ends, without trace of any common receptacle to which they might be attached. These seeds are rounded upwards, triangular and tapering to a point downwards, as seen in fig. 25a, enlarged five times. The space which contains these seeds in the middle of nodules, is filled with a calcareous, white compound, in which the yellowish brown seeds are imbedded without any apparent regular order.

On the shales at Morris, where clusters of the same kind have also been observed, the agglomerations are flattened in irregular round patches, about one inch in diameter, no more than half an inch broad. Though these seeds, by their form and size, are similar to those which have been figured by Goldenberg in his Fl. Sarr., 2, pl. 10, fig. 1 and 2, as seeds of *Sigillaria*, and also to those remarked under the scales of true cones of *Sigillaria* found in Ohio by Dr. Newberry, their generic relation is still uncertain. They are evidently referable to some species of the family of the *Selaginaceae*.

Collected by Mr. Jos. Even.
ORGANS OF UNCERTAIN AFFINITY.

Genus PALÆOXYRIS, Brgr.

Spindle-shaped strobiles, covered with closely imbricated rhomboidal scales, disposed in spiral order, the inferior ones passing to an angular pedicel, the upper ones lengthened into linear appendages.

This description is copied from Unger's genera, and though inappropriate for the classification of the species referred to it, this genus is preserved, with its diagnosis, for the good reason that, as will be seen hereafter, the true nature of these organs is unknown.

PALEOXYRIS PRENDELI, Sp. nov.

Pl. xxvii, fig 10 and 12.

A spindle or bottle-shaped body, appearing like a flattened small bladder, enlarged in the middle, tapering into a long neck, more abruptly rounded and narrowed downwards into an obtuse point, surrounded by a double line of thin but deep filaments or striæ, scarcely half a line distant, often close to each other, ascending in spiral form from the basilar point, at first in an obtuse angle with the borders, but elongating upwards and ascending into the neck where they become nearly parallel to its sides. The surface of this capsular body is formed of a thin pellicle, and by its compression, the spiral lines of both sides are marked upon it, thus forming, by their crossings, a trellis of more or less enlarged rhomboidal divisions. In ascending into the neck, the spiral lines approach...
Hystrichosoma unguiculatum, new species, published by L. 1791. Fossil remains, attributed to Schimper, and described by Schimper, 1857. The body is elongated, with a posterior part...

2. Cardo's carpus (Caryolothid, singular). It is a small plant, 1 to 2 feet high, with a few small leaves. They are smooth, oval, or elliptical, and have a short, thick stem. The flowers are small, white, and fragrant. They are found in dry, sandy soil, and are used for ornament.

3. Caryophyllus, or Moss pink, is a genus of small, herbaceous perennials. The flowers are usually pink or red, and are borne in small, dense clusters. The leaves are usually narrow, linear, and are arranged in a basal rosette.

4. Cardo's carpus elongatus. This is a species of Caryophyllus, which is characterized by its elongated, narrow leaves. The flowers are pink, and are borne in clusters. The plant is found in dry, open areas, and is often used as an ornamental plant.

5. Caryocarpus, or Common cardoon, is a genus of plants in the family Caryophyllaceae. The flowers are pink, and are borne in clusters. The plant is often used as a ornamental plant.

6. Caryocarpus. There are several species of Caryocarpus, which are characterized by their large, showy flowers. The flowers are pink, and are borne in clusters. The plant is often used as a ornamental plant.

7. Caryocarpus, or Common cardoon, is a genus of plants in the family Caryophyllaceae. The flowers are pink, and are borne in clusters. The plant is often used as a ornamental plant.

8. Caryocarpus, or Common cardoon, is a genus of plants in the family Caryophyllaceae. The flowers are pink, and are borne in clusters. The plant is often used as a ornamental plant.
Waldbauerus, Ped. 665. Specimens. Real. Length of body, 2.4 mm. Width of body, 1.5 mm. Head. The head is broad and flat, with a narrow, flat, triangular surface. The oral lobes are long, narrow, and pointed. The mouth is small, with a narrow, flat, triangular surface. The body is broad and flat, with a narrow, flat, triangular surface.

The oral lobes are long, narrow, and pointed. The mouth is small, with a narrow, flat, triangular surface. The body is broad and flat, with a narrow, flat, triangular surface.

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Forms of the Coal

There were a few specimens by a different borer, which appear to have been somewhat flattened. In that state it is difficult to see the
reduction of the outside surface does not correspond to that of the
original piece. A great many of the fossils in this case appear to have
been surrounded by a Peracoceras. The body chamber and furrows outside are
subby compression, this part of the fossil is sometimes displaced and to judge
by the area it seems to be a layer of soft clay. What of the specimen of the lane may
be removed entirely from the rock with a knife. This specimen consists of a large
area, the internal area of the Peracoceras. The text of the lane,
closer together, than the external one. The fossils differ in all cases
and the depth of the space in each case.

1. Cardioceras (Pachytopus?). The nucleus Cardioceras in general is
characterized by several elements of the same, round to an oviform, corresponding to the long flat hynh. The shell is very large, and
the tendons are quite large. The body chamber is about the size of the/nucleus, both large, and consists of two large angles. The body shell is
bent down and all eight millimeters longer than the base of the nucleus.

2. Cardioceras fluviolense (Pachytopus). The fossils appear to be
belong to the same genus.
more and more, nearly uniting into one. The whole surface is marked with close, very narrow lines, running in the direction of the twining, and discernible only with a strong glass. The borders are smooth or without any projections.

On the specimen represented, fig. 12, the spiral lines are erased in the middle of the body, which is there undulately and irregularly wrinkled like the outside of an empty bag. As the form, the distance, and the direction of the spiral lines from under the neck and upwards, where they are distinct, are the same, I consider this specimen as representing a modification of this species by age.

The best specimen found to the present time, of all those referable to this genus, is that represented fig. 10. It was kindly presented to me by Mr. Michael Prendel, of Morris, for whom the species is named.

It is, like all the others mentioned here below, from the concretions of Maizon creek.

**Palaeoxyris appendiculata, Sp. nov.**

**Pl. xxvii, fig. 11.**

Body spindle-shaped, ovate in the middle, tapering and elongated at both ends, filaments placed at about equal distances from each other, distance averaging the twelfth part of an inch, turning at the middle in a nearly horizontal spiral, descending downwards in a more acute angle, and abruptly terminating above and in ascending, in a concave straight blade, where they become parallel with its borders. On both sides, in the middle of the body, the lamina or substance intermediate to the spiral filaments, protrudes outwards forming irregularly pointed triangular teeth or appendages, which, however, are not marked at some places. This shows them to be the result of a mere mechanical lateral projection, like those which would be produced on its sides by the compression of an envelope, either formed of twisted, concave, semi-cylindrical blades, or of a soft bladder, surrounded by strong spiral fibres. Our figure may be represented in a wrong direction, or turned upside down.
PALEONTOLOGY OF ILLINOIS.

Paeoxyris corrugata, Sp. nov.

Pl. xxvii, fig. 13.

Its form is, like that of the former, spindle-shaped, more elongated, and gradually tapering to both its ends. Its surface, irregularly folded and wrinkled, has not any trace of spiral fibres. In its upper neck, the body appears passing into parallel blades, while downwards it is bordered by two leaf-like appendages of a coriaceous substance. These linear blades are somewhat concave, the one bending downwards, the other upwards, like the remains of spiral, still half bent laminae. The folds of the body do not show any peculiar form like the outline of a hard substance inclosed, but they are mere irregular wrinkles, like those which could be formed upon the outside of a crumpled empty bag.

From what is said in the above descriptions, it is evident that the true nature of the organs placed under this generic name is unknown. They cannot have any relation to the flower-bearing spikes of a Xyris, for they do not show any trace of scale-like bracts, forming a flower head, or of points of attachment of such scales; nothing that could be compared to flowers or to their receptacles. If these bodies were more regular, and appearing as though containing some nutlet, they could be compared, by the rhomboidal marks of the surface, to some fruits of palm, like those of the genus Mauritia or Lepidocarpum. But in all the vegetable organs of this kind, the disposition of the scale-like surface of the walls is far more regular than it is in ours. It is not quite evident whether the spiral lines marked on the outside are formed by the twisting of leaf-like blades, or by mere thread-like filaments. The variety in the distances between these lines, as seen fig. 10, tends to support this last supposition, while the lateral projections of the borders, in fig. 11, and the leaf-like appendages seen at the point and base of our two last species seem, on the contrary, to indicate a conformation by the spiral winding of grass-like leaves. In this case, it could be supposed that these bodies represent rhizomas of some plant like Cordatis, whose unfolding of the leaves is in a spiral, and which might be seen already folded in that way in the embryonic or radiculose state? After all, they may belong to the animal rather than to the vegetable kingdom, and represent envelopes formed in that shape by some kind of insects for inclosing the larvas. Their irregularity seems to dictate this conclusion. The two figures given by Count Sternberg in Vers., 2, p. 189, pl. 59, fig. 10 and 11, of Paeoxyris Munsteri, represent a species far different from ours; but if the figures are exact, they distinctly show that the spindle-shaped body is an envelope, formed by the twisting of three or four leaf-like blades, for at the upper and lower ends, where the twisting ceases, these blades separate, and are seen
Falaceopsis arenacea 24. In Guzelyurt Gjipme, specimen from 1847. I find there is a number of specimens of this species in museum and none other. They all show the characters as described. One specimen 25 is Glutty 999, intermedium, long twisted furrowed, is in three segments which however are impressed upon a single, narrowed leaf 5/5 cent long, and very narrowly, equally narrowed on both sides, the blade of Andants.

1. Equilateral Centrilepis Lec. 1938 (specimen 6) seems to represent the species, but in different aspect, according to the four immured and the stone. The specimen has about this arrangement in my fig. No. 1 p. 461 474 5 5, somewhat smaller, but the blade can extend. He inserted between the middle by a larger narrow costa, and this appears a Tuyon gajus. P. 239. 9 cm. also, in part, the blade with the surface smalt only, near, with middle broadness without base of costa. Probably the other one from the place the costa of the inner blade, in the middle.

Two other species show the first bindery a broad, more or less smooth, with two furrows. Two other species show the first bindery a broad, more or less smooth, with two furrows.
Applemont, Novembr. 1626

Applemont (Selmesia) (Schmoll). I have a preser
ing-thing. It represents a large form or a morgan, 5" out broad, irregularly oval, body, and four
feet. The legs do not reach
the vineyard, but an alternat. attached to the middle, on both sides of
the vineyard, covering it on one side, and
stomachly curving the point of
attachment appearing as the middle, between, and small 5 millin
in diameter. Underneath the vineyard, not very clear, but brown, distinctly
showing a zigzag of the leaflet, and their alternat. position, the
vena of the leaflet, leaflet of 1½ millin, less than one cent long, see below (2)

2. Neuroperis. angustifolius, C. Bin. There is an Mt. MT collection of a
large fragment of a leaf of that species. The leaf is 5½ millin, broad alter
nately forked nearly in right angle, and the ramifications a branch
about 1½, third in the primary rachis, and 1½ cent distant. The first
primary leaves are very long but mostly preserved to whole length, the leaf
of 1 is 1½ centimeters long, breadth distant alternate, branch 1½

Simple, mostly compound or triphyllous, having 1 leaflet
typically oval, small oval leaves at the base of the leaf. One. These are generally

divided, some in the middle of the leaf, some and smaller leaves.
The leaf is generally, lanceolate, in narrowing to an outer point, curled
at the base, blade, primary leaflet, enlarged, a spur, or tooth, than
primary rachis, also leaves glabrous, which however are simple and broad.
No trace of veins is observable upon any of them. The distance between
the summit of the main rachis is now than two centimeters. The summits
are 1½ to 2 cent broad at the base where they are tightly elongated.
The ramifications and arrangement is that of 1

N. Angustifolius. C. Bin. The summit of the leaflet upon the main rachis
of the above Neuroperis angustifolius indicates the place and relative position
of their leaf, elongating above the leaflet as described above (1).
Another item of Mt. MT represents three leaves, 1 centimeter, 2 millin
in diameter.

Neuroperis. Clausius, in. The leaf of the plant has the two blade
of the leaf, length 11½ centimeters. 1. 167. 42

Neuroperis. angustifolius, C. Bin. Neuroperis. 1/3 of
the leaf, and still above the leaflet, apparently refer to this species. They are variable
in length, from 1½ to 2½ cent broad at the base, and from 2½ to 3½ cent long, they
are all comparatively narrower than any form of plant, a few

leaves, and all without trace of veins, with 1½ cent in diameter, 1½ to 2½ centimeters at the upper leaves. The equation is generally
long, elongate, leaflet either straight or curved (1½ cent broad at the leaf)
the leaflet appears to have been bifurcate at the base, 1. 167. 42.

F. Clausius, in. The

leaf, length 11½ centimeters. 1. 167. 42

Neuroperis. angustifolius, C. Bin. Neuroperis. 1/3 of
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long, elongate, leaflet either straight or curved (1½ cent broad at the leaf)
the leaflet appears to have been bifurcate at the base, 1. 167. 42.
Neuropteris Gisea nov. S Leithi affinis. LM 572. The species is represented by a pair of pinnules, as follows: front- and hind-pinnules nearly in right angles to the pinnules, alternate, the lower 7 to 8 cm, distinctly decurrent, toward the upper-pinnules, parallel, subdorsally, along oral-edges, truncate to a carinal plane, evolved, showing the rounded form of S Leithi; terminal pinnules oral, others, scarcely lobed or as a tufa covered with a rough spiny field of scales, continuing the inner or pinnate lobate or deciduous, if present on the under-side. The pinnules have the apical pinnules, the pinnulae, and the smaller ones nearly straight toward the point of the spine. Four different lines of dichotomie, pointing at the border 2 to 8 mm. The leaf would make 175 to 300 pinnulae. The marginal leaf is convex, and regularly curved. The length of parallel leaf edges is about 3 to 4 mm. If this may be taken as a rule of S. Leithi as a remarkable one. This may be the species which I considered as A. pubescens proem. But the reference to this may be only for some fragments with terminal pinnulae. The pinnulae have then lanceolate and ovate or pointed.

9. Neuropteris Clathrotriche. Large specimens a pinnule 50 cm. by 50 cm. broad, with the upper pinnules dichotomous, the last pair falling from the upper pinnule at 25 cm. on, separated at base by different forms to be included in my species. The leaflet of form of the pinnule are (quantity) one of species 9, 323.-9. The few are (number, oral or often) at both ends (frequency) 1 millimeter long, 1-4 millimeter broad with some circular or oval, at a. placed generally in two rows near the middle in the direction of the lateral sides. The pinnule is 380 a. feet.

Neuropteris clathrotriche. A specimen five foetters, 1.5 feet has leaflets, ten pair, cut into the leaflets, the terminal 3 mm. long, parallel, show more of the leaflets. The leaflets are the form of the leaflets. The leaflet is at right angles, the leaflets are at right angles, the leaflets are at right angles, the leaflets are at right angles. The leaflets are at right angles, the leaflets are at right angles, the leaflets are at right angles, the leaflets are at right angles, the leaflets are at right angles, the leaflets are at right angles.
FOSSIL PLANTS.

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linear and parallel, each about one-eighth of an inch broad, with the same form, size and position, at both ends of the inflated body. Such a conformation seems far more the result of animal industry than of vegetable organization.

The species hitherto referred to this genus, are, with the first-named: *P. Munsteri*, of Sternb., *Paleoxyrys regularis*, Brgt., loc. cit., which, by its regular scale-like scars, is different from ours; *Paleoxyrys multiceps* and *Paleoxyrys rhombea*, two species of F. Braun, merely enumerated in Unger’s Genera and Spec., without description. The two last species, like that of Sternberg, are from the Keuper Lias: that of Prof. Brongniart, from the Permian. Our species, represented in the lower part of the true Coal Measures, are therefore interesting to science, from their geological position.

Mazon creek, Grundy county.

The following species have been found and communicated to me since the preparation of the plates: and have not yet been figured:

**Neuropteris microphilla**, Brgt.

*Foss. Flor.*, p. 245, Pl. 74, fig. 6.

Represented by two specimens from Mazon creek, which, though showing the characters marked by the author, do not distinctly indicate whether the species is truly a distinct one, or merely a small form with obscure nervation of *Neuropteris Loschii*, Brgt.

**Neuropteris angusti-folia**, Brgt.

*Foss. Flor.*, p. 231, Pl. 64, fig. 3 and 4.

The specimen is an exact representation of Brongniart’s figures of this species. The surface of the leaflet is smooth or without hairs; the veinlets somewhat coarser, and not quite as distinct as in *N. hirsuta*, are marked at the upper part of the leaf and at the base of the veinlets by the same kind of swelling or tumor which is seen in the author’s species, and has been considered by him as remains of fructification. The leaf at its base is elongated on one side in a kind of auricle, and abruptly narrowed or truncate at the other, linear lanceolate, obtusely pointed with a comparatively broad pedicel one-fourth of an
inch long. This last character seems to unite this species to *Neuropteris Scheuchzeri*, Brgt., which the author considers as probably identical with *Neuropteris angusti-folia*. I have lately received from Mr. S. S. Strong, and also in a concretion from Mazon creek, a splendid specimen representing the top of a pinna of *Neuropteris hirsuta*, Lesq., in the process of unfolding, or still curved in spiral, whose leaflets, very hirsute on one side only, are narrow, linear lanceolate, and unequal at base, exactly like the leaflets of *N. angusti-folia*, Brgt. I am, therefore, not yet satisfied that this last species is a distinct one, and still believe that it may represent a form of *N. hirsuta*, as it has been explained, Geol. Rept. Penn., p. 857.

Concretions of Mazon creek; from Mr. Even.

**Neuropteris crenulata**, Brgt.

*Foss. Flor.*, tab. 64, fig. 2.

I refer with doubt to this species a specimen procured by Mr. S. S. Strong from the concretions of Mazon creek. It represents the upper end of a pinna bearing oblique, oblong, obtuse leaflets, attached to the rachis by the narrowed base, forming a broad pedicel, and of the same form as those figured by Brongniart. The upper leaflets are simple, the lower ones compound, or bearing on each side at their base a round, small, cyclopteroidal pinnule. The medial nerve of the leaflets is obscurely inflated, the veins and veinlets are distant, arched, distinct, not inflated, forking once or twice; the borders are slightly crenulate by a contraction of the epidermis at the point of the veinlets. Our specimens agree well enough with some of this species obtained from Pennsylvania, as also with the description of the author. There is, nevertheless, a difference especially marked by the division of the inferior leaflets with small round pinnules at the base, like those of *Neuropteris hirsuta*, a division which has not been heretofore noticed in this species. The teeth of the borders are also less prominent and distinct on our own specimen.

**Callipteris Sullivantii**, Lesq.


Some specimens, in concretions from Mazon creek, show the lower divisions of the pinnae more elongated, and pinnately cut-lobed, as in species of *Alethopteris*. This kind of subdivision would therefore indicate the place of this species in this last genus, as admitted by Schimper, Palaeont. Veget., p. 561. But the peculiar nervation of this fine fossil fern, which is half neuropteroidal, has
1. Callopterus Bullivantii, sp. The specimen Col. 5 of the museum has the middle leaflet more than one inch long, or still longer for the top is broken off. Both the lobe and the lobe on both sides of the pinna are deeply undulate, broadly lobed, the cauline lobe attached to the point of juncture of the main sheet. It is broadly reniform with the exception of a crenation and further without trace of the involute sheet. The tip of the lobe has that of the middle nearly ascending to the middle. The specimen should be figured. 20/6/11

2. Callopterus Bullivantii, sp. A specimen No. 112 show this species with long leaflet, the terminal pinnule long, lanceolate, sub-pinnate only 12 millimeter 6 millimeter broad toward the base. Leaflet slightly enlarged 1/3 in character of resolution in C. bullivantii.
Although long-fish (Genopterus) a small portion of an ultimate spine with clear enamel, Fig. 192 A. It was figured 5.1.559. with the enamel, enlarged. Has a form exactly that of Brongniard. The fish that is of note, is...
a close analogy with the species admitted by Brongniart as the type of his genus *Callipteris*. When better known it may probably indicate the character of a new genus.

**ALETHOPTERIS LONGIFOLIA, Brigt.**

*Foss. Flor.*, p. 273, Pl. 83, fig. 2.

The specimen, a fine one, represents the upper part of a pinna, with a broad half round rachis, bearing alternate, horizontal, narrow, linear, simple pinnules, attached to it by their whole base, but not connate, with entire or scarcely undulate borders. The nervation is exactly as figured and described by the author. The leaflets are marked by round scars of *sori*, placed near the border, one only upon each middle vein; the details of their structure cannot be seen, but they greatly differ in form and position from those of *Alethopteris emarginata*, Gopp.

Concretions of Mazon creek; Mr. Even.

**ALETHOPTERIS PENNSYLVANICA, LesqX.**

*Penn. Geol. Rept.*, p. 864, Pl. ii, fig. 1 and 2.

In the shales of Morris; Mr. S. S. Strong.

**ASTEROCARPUS GRANDIS, Sp. nov.**

Upper end of a pinna, two inches long, a little more than one inch broad at the broken base, evidently part of a large frond. The lanceolate pinna is simply divided into alternate, open, lanceolate, obtuse pinnules, one-fifth of an inch broad at their connate base, and one-half of an inch long, with a smooth surface or with merely an obscure medial nerve, without other traces of nervation. The fructification is marked by large starlike *sori*, placed near the borders of the pinnules, four on each side, one at the top, with six to ten sporange-cells pointed towards the center, obtuse to the outward. The form of the sporanges is the same as in *Asterocarpus Sternbergii*, Gopp., *Foss. Farn.*, p. 188, pl. 6, fig. 1 and 2, but they are
larger and more distant from each other. The form of the pinna and of its division is also totally different in our species.

Mazon creek; S. S. Strong.

A number of specimens, representing fruiting pinnae of Pecopteris or Alethopteris, have been recently obtained from Mazon creek, but are left undescribed, the essential characters, form and position of the sori, nervation, etc., being too obscure for a satisfactory diagnosis.

**Hymenophyllites furcatus**, Brgt.

Veg. Foss., p. 179, Pl. 49, fig. 4 and 5.

A few small specimens of this species have been collected by Mr. S. S. Strong, from the roof shales of Morris. It is rather a sub-conglomerate species, being found most abundant at the base of the mill-stone grit, or the top of the red sandstone, in the anthracite basin of Pennsylvania.

**Stigmarioides? rugosus**, Sp. nov.

As much as can be seen from two specimens obtained in concretions at Mazon creek, by Mr. S. S. Strong, the stem is cylindrical, two to three inches in diameter, marked with circular depressions, points of insertion of branches, or rootlets diverging from it all around, enlarged at base, cylindrical, flattened by compression, tapering or diminishing in size from the base, half an inch broad to the top, one-fourth of an inch in diameter, where these rootlets are broken, two and a half inches from the points of insertion. Their surface is wrinkled and narrowly striate in their length, and marked by small round holes, which appear as the basilar points of attachment of branches of rootlets. The cross section of half a cylindrical stem is obscurely seen, and appears to be marked by broad tubercles like those of a stem of a Calamites, only much larger. There is nothing published as yet, which can compare with these fossil remains, but the roots of *Equisetum Mougeotii*, Schp., Pal. Veg., pl. 13, fig. 9. I consider them as representing the rhizomas of some *Equisetaceae*.
Aadontopterus. Wrought in 1390 by a skilled workman, representing a marine crea-
ture, a large fish with a long, slender, tapering body, ending in a tail.

The form recall the sperm whale, with long, thin, slightly curved, and with a slender, more distinctly curved than the other fins. Found near the coast, and upon the same grounds as the sperm whale, which is a long, slender, tapering body, ending in a tail.

The sperm whale, or bryde's whale, is a large, long-bodied marine mammal. It is the largest extant species of toothed whale, with males reaching lengths of up to 18 meters (59 feet) and weighing as much as 20 tons. The bryde's whale is one of the most distinctive-looking whales, with a slender, streamlined body and a long, tapering snout.

The sperm whale is a highly social species, often seen in large pods. They are known for their intelligence and communication abilities. The sperm whale is a deep-diving species, spending much of its time below the surface of the water, where it feeds on squid and other deep-sea organisms. The sperm whale's diet also includes a variety of fish, crustaceans, and other small marine animals. The sperm whale's long, flexible tail is used for swimming and maneuvering, allowing it to navigate through the water with ease.

In addition to its physical adaptations, the sperm whale has unique biological features. It is one of the few whales to have a baleen, or comb, in its mouth, which it uses to filter food from the water. The sperm whale also has a large, bulbous head, containing the largest known concentration of blubber in any marine mammal. This blubber is used for insulation and energy storage.

The sperm whale is an apex predator, playing a crucial role in the marine ecosystem. Its feeding habits and movements can have significant impacts on other species, influencing the distribution and abundance of other marine life. The sperm whale is also an important cultural and scientific subject, with a rich history of study and conservation efforts.
double as long as the leaf itself. 325 and therefore part of a leaf of at least 20
was, and this leaf long and broad toward the base in the entire plant.
above the leaf. One part is the base, which is divided into two

Vegeta palmato, and represented with four fingers, threadlike

on long and narrow. The species are not different from those
of Illinois, at least in size and general outline. I believe however
that they may be referred to the same species. The species is the

same. Two lateral veins forking generally twice and divided and
longer than 12. 20 in one centimeter at the border. (ibid.)

Adventitious, on the 21st. I have figured two specimens of the

same. These detached in no. agree with Whipple's description and Brugueir's

and described, as it is also upon the leaf of Morris.

Odonolyntrum (odonolyntrum) buckleyi. Dr. D. good specimen from Clinton.

No. 359 is a large fern of the same; in fact, exactly a common

6 cent. long and broad. I have the plant not divided, closer, and the mixed with the

very numerous pairs of leaves. No. 22 is a new species

Halogymnion (cyblayi) buckleyi. The

second, the larger one is 14 cent. long, which, eleven pairs of alternate-soft

large leaflet attached to the rachis is half their base, so that in my

figures. 325 millim. in breadth, 47 millim. in length, of the leaf, gradually area.

no only palmate different species. (ibid.)

Odonolyntrum luridum. 325 has 15 a species. Here, the leaves are divided into two

subspecies, which is the same character, nearly equal

3 ecnt. long and broad. I mean the species is any trace of

palmated, and divided by a central vein into

the leaf, and not divided. This is a true Odonolyntrum, comprehending

no only palmate different species. (ibid.)

Odonolyntrum luridum. 325 has 15 a species. Here, the leaves are divided into two

subspecies, which is the same character, nearly equal
DISTRIBUTION OF THE FOSSIL FLORA OF THE ILLINOIS COAL FIELDS.

The following table enumerates all the species of fossil plants known to this time, (March, 1870,) from the Coal Measures of Illinois, and indicates the location where the specimens representing them have been found. This synopsis of the fossil flora of the Illinois coal fields may serve to elucidate the remarks which have been suggested by the study of this flora. The figures marked on the table show approximately the proportion of specimens which represent each species: 1, for example, for a species represented by less than five specimens; 12 for a species represented by one hundred or more.

<table>
<thead>
<tr>
<th>List of Fossil Plants</th>
<th>Diagram</th>
<th>Merriam</th>
<th>Colesbee</th>
<th>Lodi creek</th>
<th>Other localities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Neuropteris hirsuta, Lesqu.</td>
<td>6</td>
<td>12</td>
<td>1</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>3. &quot; angustifolia, Brpt.</td>
<td>6</td>
<td>12</td>
<td>1</td>
<td>12</td>
<td>1</td>
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<tr>
<td>4. &quot; fasciculata, Lesqu.</td>
<td>6</td>
<td>12</td>
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<td>12</td>
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<tr>
<td>5. &quot; Collinsia, Lesqu.</td>
<td>6</td>
<td>12</td>
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<tr>
<td>6. &quot; flexuosa, Brpt.</td>
<td>6</td>
<td>12</td>
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<tr>
<td>7. &quot; plumatula, Lesqu.</td>
<td>6</td>
<td>12</td>
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<tr>
<td>8. &quot; rotundifolia, Sternb.</td>
<td>6</td>
<td>12</td>
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<tr>
<td>9. &quot; capitata, Lesqu.</td>
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<td>10. &quot; plicata, Sternb.</td>
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<td>11. &quot; Loschi, Brpt.</td>
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<td>12. &quot; microphylla, Brpt.</td>
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<td>13. &quot; tenuifolia, Brpt.</td>
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<tr>
<td>14. &quot; vernicularis, Lesqu.</td>
<td>6</td>
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<tr>
<td>15. &quot; alpina, Bumb.</td>
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<td>16. &quot; infesta, Lesqu.</td>
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<tr>
<td>17. &quot; Clarksonii, Lesqu.</td>
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<td>18. &quot; coriacea, Lesqu.</td>
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<td>19. &quot; tetraphylla, Brpt.</td>
<td>6</td>
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<tr>
<td>20. &quot; Desori, ? Lesqu.</td>
<td>6</td>
<td>12</td>
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<tr>
<td>21. &quot; Everiti, Lesqu.</td>
<td>6</td>
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<tr>
<td>22. &quot; verbascifolia, Lesqu.</td>
<td>6</td>
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<tr>
<td>23. &quot; crenulata, ? Brpt.</td>
<td>6</td>
<td>12</td>
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<tr>
<td>24. &quot; pachyderma, Lesqu.</td>
<td>6</td>
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<tr>
<td>25. Dietyopteris rubella, Lesqu.</td>
<td>6</td>
<td>12</td>
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<td>12</td>
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</tr>
</tbody>
</table>

Other localities:
- Lodi, Indiana.
- Neeleyville.
- Alton.
- Alton and Grayville.
- Abounds at Grayville.
- Grayville.
- Rock Island.
- Still doubtful.

Note: The page contains handwritten annotations and corrections, but they do not affect the readability of the main content.
### List of Fossil Plants.

<table>
<thead>
<tr>
<th>Species</th>
<th>Duquoin</th>
<th>Mazon Creek</th>
<th>Other localities</th>
</tr>
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<tbody>
<tr>
<td>27. Odontopteris</td>
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<tr>
<td>28. Heterophylla</td>
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<td>29. <em>subcuneata</em></td>
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<tr>
<td>30. <em>Bradyi</em></td>
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<tr>
<td>31. <em>Schlothiemia</em></td>
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<tr>
<td>32. <em>aquinula</em></td>
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<tr>
<td>33. Alloptopteris <em>scribula</em></td>
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<tr>
<td>34. <em>aquinula</em></td>
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<td>35. <em>Pennsylvaniaca</em></td>
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<td>36. <em>Massillioris</em></td>
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<td>37. <em>Mazoniana</em></td>
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<td>38. <em>Owenii</em></td>
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<td>39. <em>evenulata</em></td>
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<td>40. <em>hymenophyloides</em></td>
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<td>41. <em>Hallii</em></td>
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<td>42. <em>inflata</em></td>
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<td>48. <em>callosa</em></td>
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<td>51. <em>lanceolata</em></td>
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<td>53. <em>longifolia</em></td>
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<td>54. <em>solida</em></td>
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<td>55. <em>stellata</em></td>
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<td>56. Calopteris <em>Sullivani</em></td>
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<tr>
<td>57. <em>Pecopteris</em> <em>Strongii</em></td>
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<tr>
<td>58. <em>Silhuanai</em></td>
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<td>59. <em>quamosa</em></td>
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<td>60. <em>arguta</em></td>
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<td>61. <em>Candolliana</em></td>
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<td>62. <em>eyrachea &amp; arboreascens</em></td>
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<td>63. <em>aspidoioides</em></td>
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<td>65. <em>hemioteioides</em></td>
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<td>66. <em>villosa</em></td>
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<td>67. <em>velutina</em></td>
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<td>68. <em>ochropterioides</em></td>
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<td>69. <em>Bucklandi</em></td>
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<td>70. <em>pteroideis</em></td>
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<td>71. <em>Cistif</em></td>
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<td>72. <em>polyoquidai</em></td>
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<td>73. <em>abbrewitana</em></td>
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<td>74. <em>unita</em></td>
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<td>75. <em>chegana</em></td>
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<td>76. <em>dentata</em></td>
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<td>77. <em>plumosa</em></td>
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<td>78. <em>flavicana</em></td>
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<td>79. <em>Murrayana</em></td>
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<tr>
<td>80. <em>chareophyllides</em></td>
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<td>81. <em>Newberry</em></td>
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<tr>
<td>82. <em>Asteroecarpus grandis</em></td>
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<tr>
<td>83. <em>Staphyopteris</em> <em>Worthenii</em></td>
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<tr>
<td>84. <em>asteroides</em></td>
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<tr>
<td>85. <em>sagittatus</em></td>
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</table>
Peppers, continued

(1) *Peperomia angularis* (Dyer), 1.7.20 (Coll. of Cambridge) is a new species of this genus, found in the types of the green, small, funnel-shaped flowers.*

*Peperomia angularis* is a small, green, succulent plant that grows in the tropical rainforests of the Americas. The leaves are oval-shaped and have a waxy texture, which helps them retain water in their natural environment. The flowers are small and white, and they bloom in clusters along the stems. The plant is often used in indoor gardening because of its ability to thrive in low light conditions and its tolerance to a wide range of soil types. The leaves of *P. angularis* are also used in traditional medicine to treat various ailments.
### List of Fossil Plants

<table>
<thead>
<tr>
<th>Number</th>
<th>Species Name</th>
<th>Localities</th>
</tr>
</thead>
<tbody>
<tr>
<td>86.</td>
<td>Sphenopteris scaberrima, Lesqx.</td>
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</tr>
<tr>
<td>87.</td>
<td>&quot; gracilis, Brgt.</td>
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<tr>
<td>88.</td>
<td>&quot; mixta, Schp.</td>
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</tr>
<tr>
<td>89.</td>
<td>&quot; pamperea, Lesqx.</td>
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<tr>
<td>90.</td>
<td>&quot; irregularis, Sternb.</td>
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<tr>
<td>91.</td>
<td>&quot; obtusiloba, Brgt.</td>
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<tr>
<td>92.</td>
<td>&quot; latifolia, Brgt.</td>
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<tr>
<td>93.</td>
<td>&quot; trifolia, Brgt.</td>
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<tr>
<td>94.</td>
<td>&quot; abbreviata, Lesqx.</td>
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<td>95.</td>
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<td>141.</td>
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<td>143.</td>
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<td>144.</td>
<td>&quot; bistriatus, Lesqx.</td>
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**Other localities:**
- 23 spleonopteris scaberrima, 21 Sphenopteris gracillima.
- 60 Fossil Plants.
<table>
<thead>
<tr>
<th>List of Fossil Plants</th>
<th>Du Quoin</th>
<th>Colchester</th>
<th>Morris</th>
<th>Mazon creek</th>
<th>Other localities</th>
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| 145. Calamites approximatus, Brgt | 1 | 1 | 2 | 1 | and Carmi,  
| 146. " undulatus, Brgt | 1 | | | |  
| 147. Artisia transversa, Sternb | | | | | Grayville.  
| 148. Selaginites uncinatus, Lesq | 2 | | | |  
| 149. caribolius, Lesq | 1 | | | |  
| 150. " crassus, Lesq | | | | |  
| 151. Lycopodites annularisfollus, Lesq | | | | |  
| 152. " Meekii, Lesq | | | | |  
| 153. " asterophyllitesfollus, Lesq | | | | |  
| 154. Schizaliza bracteata, Lesq | | | | |  
| 155. Lepidodendron rigor, Lesq | | | | |  
| 156. " Meekii, Lesq | | | | |  
| 157. " costatum, Lesq | | | | |  
| 158. " ruarosum, Brat | | | | |  
| 159. " obovatum, Sternb | 3 | 3 | 1 | |  
| 160. " gracile & elegans, Brgt | 3 | 4 | 1 | |  
| 161. " Veltheimianum, Sternb | | | | |  
| 162. " dichotonom, Sternb | | | | |  
| 163. " mammillatum, Lesq | | | | |  
| 164. " crassus, Lesq | | | | |  
| 165. " modulatum, Lesq | | | | |  
| 166. " . clypeatum, Lesq | | | | |  
| 167. " elongatum, Lesq | | | | |  
| 168. " punctatum, Sternb | 2 | | | |  
| 169. " punctatum, Lesq | 2 | | | |  
| 170. " punctatum, Sternb | 2 | | | |  
| 171. " punctatum, Lesq | 2 | | | |  
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| 199. " punctatum, Sternb | 2 | | | |  
| 200. " punctatum, Sternb | 2 | | | |  
| 201. " punctatum, Sternb | 2 | | | |  
| 202. " punctatum, Sternb | 2 | | | |  

Chester group.
1. **Sigillaria capsulata**. Page 143, p. 446 (A) Describe the cross section of the stem and base of the stem. The stem is cylindrical, the base is broad, and the cross section is rounded. The venation is radial, and the petioles are long, somewhat slender. In all figures, they are nearly half as long. The center of the cross section is marked by a central vein, and the outer edge of the cross section is marked by a broad ring. The stem is smooth, and the cross section is circular. The length of the stem is about 2.5 times the diameter. The cross section is slightly flattened, and the circumference is about 25% larger than the diameter. The thickness of the stem is about 1.5 times the diameter. The cross section is slightly flattened, and the circumference is about 25% larger than the diameter. The length of the stem is about 2.5 times the diameter. The cross section is slightly flattened, and the circumference is about 25% larger than the diameter. The thickness of the stem is about 1.5 times the diameter.

2. **Sigillaria elliptica**. Page 143, p. 446 (B) Describe the cross section of the stem and base of the stem. The stem is cylindrical, the base is broad, and the cross section is rounded. The venation is radial, and the petioles are long, somewhat slender. In all figures, they are nearly half as long. The center of the cross section is marked by a central vein, and the outer edge of the cross section is marked by a broad ring. The stem is smooth, and the cross section is circular. The length of the stem is about 2.5 times the diameter. The cross section is slightly flattened, and the circumference is about 25% larger than the diameter. The thickness of the stem is about 1.5 times the diameter. The cross section is slightly flattened, and the circumference is about 25% larger than the diameter. The length of the stem is about 2.5 times the diameter. The cross section is slightly flattened, and the circumference is about 25% larger than the diameter. The thickness of the stem is about 1.5 times the diameter.

3. **Sigillaria sp.** Page 143, p. 446 (C) Describe the cross section of the stem and base of the stem. The stem is cylindrical, the base is broad, and the cross section is rounded. The venation is radial, and the petioles are long, somewhat slender. In all figures, they are nearly half as long. The center of the cross section is marked by a central vein, and the outer edge of the cross section is marked by a broad ring. The stem is smooth, and the cross section is circular. The length of the stem is about 2.5 times the diameter. The cross section is slightly flattened, and the circumference is about 25% larger than the diameter. The thickness of the stem is about 1.5 times the diameter. The cross section is slightly flattened, and the circumference is about 25% larger than the diameter. The length of the stem is about 2.5 times the diameter. The cross section is slightly flattened, and the circumference is about 25% larger than the diameter. The thickness of the stem is about 1.5 times the diameter.
The task is to mill the mill. The shov. name 6b. 31. seen to represent the species. Add slightly away. 28 mill trends from deep canals of the lower surface. It has a set above with distinct canals. Slightly marked by the line but smooth. The speck is 6b. or 621.

Tylanna tuberculata Fr. This shows 6b. 621 seen to represent the species. Add slightly away. 28 mill trends from deep canals of the lower surface. It has a set above with distinct canals. Slightly marked by the line but smooth. The speck is 6b. or 621.

Tylanna tuberculata Fr. This shows 6b. 621 seen to represent the species. Add slightly away. 28 mill trends from deep canals of the lower surface. It has a set above with distinct canals. Slightly marked by the line but smooth. The speck is 6b. or 621.

Tylanna tuberculata Fr. This shows 6b. 621 seen to represent the species. Add slightly away. 28 mill trends from deep canals of the lower surface. It has a set above with distinct canals. Slightly marked by the line but smooth. The speck is 6b. or 621.
Sigillaria lepiderma day. (The name might be changed but it is approximately.)

A specimen of No. 715 has the bush slightly thicker, surface of both cortical and subtropical leaves distinctly though internally broad, scars still smaller. 5 mm. broad at the lower corner and as long through the ribs as 2 mm. long. Leaf dejects needles double, parallel narrow linear 11 cm. wide and longer. 4 mm. long, 1 mm. wide, medial leaf 3 mm. wide, 2 mm. long, very small with a larger space between the ribs. The middle loses much the initial termination. Subtropical leaves are longer or indeed little differing. Both species might be one or more. One of the specimens described as lepiderma being with narrow ribs being of a more recent part of the tree.

Sigillaria lepiderma day. 3. Externally species 612 may be referable to this species. Width almost equal to, 5 mm. broad, toward both ends coarsely rounded, quite smooth, scar large, same size as former, then figured by strong ribs 2 mm. distant. Distinct white-circled scars, thickly, linear, nearly uniform in the middle, more small than in No. 715. Back-thick one millimeter, not less. Middle thick same proportions, but without long, bifurcated deepened leaves in the middle of the Warren, and with the thicken. Quite smooth with the surface of the scar, of the heart-shaped part of the apparently jointed with the middle but the middle leaves remain. The thick ribs figure are not seen even at least not very distinctly they appear 5 mm. joined at the top. In this one No. 715 figure the center bear the inflated double circle and the pretender the hexagonal one. Not the center in the plate of Sigillaria new forms, or my plate or specimen also. This character of it is one might relate no 37 of Ph. 715 to the species.

Sigillaria lepiderma day. 3, 3. Same species, 715. Added to the description of No. 446 of (2) is a new species. This forester looks rounder, slightly scaled, included lengthwise or flattened, 1 1/2 broad. A few centimeters 3 mm. serrated deep, Narrow circum. 1 mm. very small, about 5/8 cent. in vertical order, scar, emarginated at the top, surrounded at the base 1 mm. wide, long 2 mm. broad. Your 3 or 531 is good but much cut on the hand 3 mm. leaf scar, the leaves and one pointed between upper region or wrinkled before. The scar along the middle distemper, double-length 1 or both side, back them in this paper some surface regularly distinctly strait, the other sharp, parallel regular, about 10 per inch. This is a very large one double more def, closer cent. Distantly related to Sigillaria dentata day.
### List of Fossil Plants

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Duquoin</th>
<th>Murphysborough</th>
<th>Colchester</th>
<th>Morris</th>
<th>Mazon creek</th>
<th>Other localities</th>
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<td>244</td>
<td>&quot; - mammillatus, Lesqx.</td>
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<td>245</td>
<td>&quot; - Carpolithes multi-striatus, Sternb</td>
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<td>246</td>
<td>&quot; - Jacksonenzia, Lesqx.</td>
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<td>247</td>
<td>&quot; - clistula, Lesqx.</td>
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<td>248</td>
<td>&quot; - fasciculatus, Lesqx.</td>
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<td>249</td>
<td>&quot; - corticosa, Lesqx.</td>
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<td>250</td>
<td>&quot; - persicaria, Lesqx.</td>
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<td>251</td>
<td>&quot; - vesicularis, Lesqx.</td>
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<td>252</td>
<td>&quot; - bullatus, Lesqx.</td>
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<tr>
<td>253</td>
<td>Sigillaria semina?..</td>
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<td>254</td>
<td>Palaeoxystria Pandeichi, Lesqx.</td>
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<tr>
<td>255</td>
<td>&quot; - appendiculata, Lesqx.</td>
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<tr>
<td>256</td>
<td>&quot; - corrugata, Lesqx.</td>
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This table enumerates 256 species of fossil plants, or more than double the number of those which were known from Illinois at the time when the second volume of the State Geological Report was published. The catalogue of the American fossil plants which served as a point of comparison for the table prepared for that volume, p. 464, enumerates 280 species, (120 from Illinois) even comprising some pertaining to the Devonian strata. It is, therefore, evident that the assertion, concerning the insufficiency of our knowledge of the flora of the Coal Measures of Illinois and of the future discoveries promised to continued researches, is fully corroborated by facts. Of the recently discovered species, seventy-nine are considered as new, and forty, though known already from Europe, had not been recognized before in our American Coal Measures.

The species marked in the table as from Morris and from Mazon creek, are from the same geological horizon. The bed of shale overlying the coal at Morris covers, apparently, the whole extent of the Coal Measures of Grundy county. At Morris, this shale contains but few nodules or concretions, while at Mazon creek these nodules are found quite abundant, having been washed from the shales into the bed of the creek. The two localities are separated in the table merely to indicate the proportion of species preserved in shale or in concretions, and to show the difference in the nature of the fossil remains. About 180 of the species enumerated in the table have been found at Morris and Mazon creek. This remarkable predominance is due to peculiar circumstances:

1st. It is at and around Morris that an uninterrupted series of researches has been pursued by the two ardent and clever investigators, Messrs. Jos. Even and S. S. Strong, so often named in this Report. Researches of this kind, in which the miners often become interested and afford valuable assistance, offer the best chances to make new discoveries. They also enable the observer to obtain, when still in place and before the fragments are scattered, specimens of the different parts of a plant; to compare the different organs, or the same organs in different positions, and thus to become better acquainted with the true nature, and with the variations of forms of the same vegetable.

2d. In the shale of Morris, there is not only a great abundance of remains of plants, but the coal which it covers is opened either by shafts, or by drifting at numerous and distant places, and therefore the flora is exposed in its local varieties. The distribution of plants in the coal epoch was evidently governed by the same laws as is now the vegetation of our swamps. There was a general uniformity of species, with a constant diversity of groups on small areas. As we see now in the peat bogs, here the ferns, there the grasses, or the rushes or the mosses, according to the degree of humidity of the surface, which varies at every step, we find, in examining the fossil plants of a given area, a con-
Questions to be treated in the Plan of the Coal files. pp. 85-111.

1. The age of the coal, its discovery, its exploration, its progress in the various basins.

2. That are the carboniferous measure, when is the lowest coal, when is the upper.

3. The geological condition of the coal masses in different states. Topic closure.

4. The surface occupied by.

5. Relation of plants to the different stages. How far it may be admitted.

6. Examining the essential character of each stage.

The purport of this work is to scientifically examine difficult and unsettled questions of geological theory of the coal, to see by them according to the characters of the general division, of the structure, the plants, the soils, etc., but to represent the idea as it has been everywhere in the belief, the coal basin and its great geographical and descriptive surface, and the coal plant, vegetable remains found everywhere around us. The coal is one of the most important indeed the most important material forms of the continent. The coal fulfils a immense extent, the coal measure I think, that lies and not only the vital material value of the coal but its nature, it comprises, will be similarly land, men and more studied and the question to often pressed now, or the character of it, plants will become more pressing. This work therefore intended as an answer to all the questions which may be made, these included in profound basis, regard to the value and relation of the pigment, which it means the pigment of my first and my gathering, collects either know it more or more important are for the study institution of it may be. If we therefore to give an exposure of all what has been see and published about now up the coal plant of the vegetable of the coal. Than that all things can be found everywhere in France, though this would have been very advisable to though published already, more often the truth when they are found before the young man there and cannot be obtained at any price but on day where the plant (ammon) have been described.
Asterogyllites (Calamoidaees) spreading them. The specimen which I reflect
the more are numerous enough, but not easily distinguished from A. sanguiniformis.
Widens to narrow near the base leaves more or less curved up and
a slightly marked margin. The dim etc. are more evident in the coiled
than in A. squamiformis and the internal longer, about as long in this case.
FOSSIL PLANTS.

stant recurrence of the same species at the same place, and a diversity only at a distance in various directions.

At Mazon creek, the meanders of the stream have dug a broad bed through the same bank of shale, and the water, washing for centuries, has uncovered great numbers of concretions and scattered them for miles from their point of origin. As a whole, therefore, the concretions represent the characters of the flora of a large area. No other place in the Illinois coal field has afforded the same advantages for research.

The shales at Colchester, Murphysborough and St. Johns, are rich in vegetable remains; but little has been done there in the way of collecting specimens of fossil plants, except by the assistants in the Survey. And from the above remarks it is easy to understand that researches made in passing, or remaining at a place only for a short time, are far from affording the chances of valuable discoveries. It is, therefore, very probable, that these last named localities have still in reservation a good many species of coal plants which are now unknown to us, and that the fossil flora of Illinois is far from being fully known at the present time.

The Report on the Flora of the Coal Measures of Illinois should have been closed here, but for the recent publication of a remarkable work on vegetable palaeontology. (1) Among other matters of general interest, this work is prefaced by some discussions on the cause and nature of phenomena attending the preservation or fossilization of vegetable remains. It also describes and critically reviews most of our new species published in the 2d vol. of the Ills. Geol. Report. This, of course, is a reason for considering, from American observations, some well established facts which corroborate or invalidate the conclusions of the celebrated author. It also provokes a discussion on the value of some of our species, and on their affinity with the flora of the Carboniferous Measures of Europe. And further, it now becomes of importance to review the conclusions which have already, or should be hereafter drawn, on the geographical and stratigraphical distribution of our species of fossil plants in relation to geology, and to fix some reliable points of reference for future researches on the subject.

(1) Traité de Paléontologie végétale par W. Ph. Schimper. Paris, Baillière & fils, 1869.
MODE OF PRESERVATION OF VEGETABLE REMAINS IN OUR AMERICAN COAL MEASURES.

§ 1st. REMAINS OF PLANTS IN COAL.

It has been erroneously asserted that the coal itself does not contain any recognizable vegetable remains, it being merely a mass of bitumen, independent of any of the plants which are found in the shales overlying or underlaying it. Our bituminous coal is generally a compound of supposed layers of crystalline matter, about one-eighth of an inch in thickness, separated by a thin coat of pulverulent coal, or mineral charcoal, which is a mere compound of cellular tissue and of vessels of plants. (2)

Generally, this agglomeration of broken tissue preserves some outline by which the genera, even the species to which the remains belong, can be recognized at first sight: leaflets of ferns, stems of Calamites, bark of Stigmaria, Lepidodendron, etc. But besides this, the coal itself, though more rarely, is marked with distinct prints of the plants of which it is a compound. This case is especially observable in a kind of hard, laminated, flint coal, obtained in Mercer county by Mr. H. A. Green, which bears on the horizontal surface of its crystalline lamellae, however thin they may be cut, the outline and nervation of leaves and branches of ferns, and other vegetables of the coal; and these are so distinctly marked, that the most delicate parts are as easily identified as those of plants preserved in shales.

The great abundance of these remains show that the whole mass of this coal, which is true coal and burns freely, is a compound of them. In the cannel coal which has been formed under water from more decomposed vegetables, the forms are more rarely recognizable. Yet the cannel coal of Breckenridge, Ky., is marked through its whole mass by stems and leaves of Stigmaria and Lepidodendron, rendered distinct by infiltration of sulphuret of iron. Even in the anthracite coal of Penna., whose matter has been subjected to heat and

(2) This fact is easily ascertained by microscopical examination. Prof. J. W. Dawson, of Montreal, has closely examined this charcoal, and published, as results of his interesting researches, numerous forms of vessels of plants. The same kind of researches had been already pursued by Prof. Goppert, who had recognized, in this pulverulent coal, remains of plants of every family hitherto known to occur fossil in the coal. (Quat. Geol. Jour., vol. 5, mem., p. 17.)
Cordata. Triggenithis. from p. 304, 410, 538, 678.

Cardinal. Triggenithis. from p. 304, 410, 538, 678.

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Cardinal. Triggenithis. from p. 304, 410, 538, 678.

Cardinal. Triggenithis. from p. 304, 410, 538, 678.
1. Conductors, as shown in Plate I, figure 3, are cut to the leaves and another with minute threads of flame attached. The character indicated for the variation of these leaves is 360, 361, or 16. The oblong tapering in the middle of the beam, average 16 mm. in 5 millimeters, a little more than three in one millimeter. The border is average about 20-24 mm. long in one millimeter. At all the conductors the veins are drawn towards the border. They are round at the edge, not sharpened near the apical vein. The length of the leaves is seen upon a greater number in two mm. 40 cent., the leaves being gradually narrower to an oblique point which is obtuse and somewhat drawn out. The leaves may be with that of Condratii, palmate, majestically graceful, but no trace of name seems to be remarked.

2. With the leaf, the lower densely packed, the internode nearly or not at all. The principal veins of the blade tend to be distinct, and also somewhat drawn out. The veins are usually almost parallel, and may be seen in the blade, leaflet, and lamina. The blade is the same with that of Condratii, palmate, majestically graceful, but no trace of name seems to be remarked.

3. Conductors, as shown in Plate I, figure 6, are cut to the leaves and another with minute threads of flame attached. The character indicated for the variation of these leaves is 360, 361, or 16. The oblong tapering in the middle of the beam, average 16 mm. in 5 millimeters, a little more than three in one millimeter. The border is average about 20-24 mm. long in one millimeter. At all the conductors the veins are drawn towards the border. They are round at the edge, not sharpened near the apical vein. The length of the leaves is seen upon a greater number in two mm. 40 cent., the leaves being gradually narrower to an oblique point which is obtuse and somewhat drawn out. The leaves may be with that of Condratii, palmate, majestically graceful, but no trace of name seems to be remarked.

Plate I. Condratii. This leaf is cut out of the stem and is shown in Plate I, figure 3, with the leaves and another with minute threads of flame attached. The character indicated for the variation of these leaves is 360, 361, or 16. The oblong tapering in the middle of the beam, average 16 mm. in 5 millimeters, a little more than three in one millimeter. The border is average about 20-24 mm. long in one millimeter. At all the conductors the veins are drawn towards the border. They are round at the edge, not sharpened near the apical vein. The length of the leaves is seen upon a greater number in two mm. 40 cent., the leaves being gradually narrower to an oblique point which is obtuse and somewhat drawn out. The leaves may be with that of Condratii, palmate, majestically graceful, but no trace of name seems to be remarked.
izyft/ns-

2. Carrot, 161. In manifold, a large group of representing the same phytoma of the same type as 159, note above. (2) A carrot has the fronds on branch also attached only a fragment of leaves mixed with upper leaves, 6.5 cent cent broad. Above, fronds narrower, there in 159. 6.5 cm 6 million only slightly enlarged above and then narrowed to the point of attachment. Above, the fronds, very narrowly heart-shaped and shortened, still more indistinct. than 161. 159. They do not arise in both the forms in 159. 161 are very obvious. so in the C. manifolde and directly attached to the ad. complex to 159. (c)

3. Carrot, 161. In manifold, a compound of narrow leaves, twisted and linear, arising from the stem of the irregularly or bendingly of three a series or more regularly formed. The upper had a single base, close parallel to lines. This case is a case of three millimeters broad very thin leaves, mixed in the same type as 161; at least when the heavy coating of cobalt malate is not of this. (c) (c) Other process which seems to represent the upper leaves separating and curving (hooked) are a compound of very thin leaves, mixed or given which deteriorating or separating toward the end. Matlab is a pencil by a hairy tubing of these leaves. The third leaf is a small compound of the same. See in 159. (c) 159. (c) (d)

4. Afters, 161. Afters a, 161. In manifold, has a number of them, in connection with Carrot, 161. But here again a diameter of 6.5 cent. The whole of the stem of the same phytoma of 161. The fronds on branch are close parallel to lines. This case is a case of three millimeters broad very thin leaves, mixed in the same type as 161; at least when the heavy coating of cobalt malate is not of this. (c) (c) Other process which seems to represent the upper leaves separating and curving (hooked) are a compound of very thin leaves, mixed or given which deteriorating or separating toward the end. Matlab is a pencil by a hairy tubing of these leaves. The third leaf is a small compound of the same. See in 159. (c) 159. (c) (d)
Somewhat variable in detail, wide in the middle of the lower half in two millimeters, expanded by 1½ and then reduced by its own height, and by its own width, forming a gamonal scale in the end of the upper half, made of the wood and of attached flowers. Flowers are oblong composed of a prominent linear broadenedgamonal scale, a gamonal scale with the upper surface of the flower, and of a short peduncle and a stem, that of the flower 1½ millimeters, gradually diminishing upwards and ending in a 2½ cent from the base where it gradually disappears. The lower the downward growth of the gamonal scale, the more evident are the ends, but the lower the downward growth of the gamonal scale, the less evident are the ends, and the more evident are the ends. The species is of a very large group of the following see part 533, (5)

Cardalea breviflora, No. 307. From a branch narrow. 1 cent broad.

Flowers by some, irregularly obtuse, base more or less spreading, and often embayed, much larger, very long, more or less angular of the flower, 1 cent broad. 3½ cent long, or in any size can be seen upon the surface where the scale 1½ more than a centimeter, broad, from 1 millimeter, abundant, an outward by the length of the scale of the leaf, and their scale, longer, having two to three leaves, which are thick with a thinking surface and the lower leaf and so on; that, at the scar, divided with a few which, is of a nanum of the following see part 533, (5)

Cardalea breviflora, No. 258. To the group may be added, the few which is figured. An abundant 1½ millimeters, broad, irregularly obtot in the length. 1½ cent broad. 3½ cent long, or in any size can be seen upon the scale of the leaf, and their scale, longer, having two to three leaves, which are thick with a thinking surface and the lower leaf and so on; that, at the scar, divided with a few which, is of a nanum of the following see part 533, (5)

Cardalea breviflora, No. 258. To the group may be added, the few which is figured. An abundant 1½ millimeters, broad, irregularly obtot in the length. 1½ cent broad. 3½ cent long, or in any size can be seen upon the scale of the leaf, and their scale, longer, having two to three leaves, which are thick with a thinking surface and the lower leaf and so on; that, at the scar, divided with a few which, is of a nanum of the following see part 533, (5)
fused to cohesion after the transformation of vegetable matter into coal, one can easily discover an abundance of remains of plants whose genera and even species are sometimes recognizable. These facts, which cannot be overlooked, may be taken into account in examining new theories in relation to the formation of coal.

§ 2. VEGETABLE REMAINS PRESERVED IN SHALE.

It is in the clay or silicious shale that the fragments of plants of the coal epoch have been more generally preserved. When a bed of vegetable matter heaped for the formation of a coal has begun to cease its growth, its top indicates a greater scarcity of vegetable remains, mixed with a larger proportion of earthy or clayey matter. The coal then becomes a less homogeneous mass, easily separating in layers of heaped fragments of vegetable and foreign matter. By and by, the vegetation becoming scarcer by superabundance of water upon the surface of the bogs, the clay is more thickly deposited, and the vegetable remains, more rare and scattered, are more distinct and more easily recognizable. When preserved in that way, the plants or their fragments have been first slowly decomposed and softened by humidity, and then more or less flattened by compression. All the naturalists who have examined the coal formations are well acquainted with the appearance of the remains found in shale, and sometimes admirably preserved. Generally, the woody tissue of the plant has been destroyed, and the surface of the stems and branches only are preserved in a thin coat of coaly matter, bearing impressions of scars of the bark, etc. For the leaves, the coaly matter represents the whole substance, and for the ferns, especially, it preserves the exact form of the vegetable and is marked by the impression of veins and veinlets, mostly distinct to their last divisions. Some leaves of a coriaceous texture have their epidermis hardened by mineralization, and separable from the shale like a transparent pellicle. It can then be easily examined under the microscope, and all the details of structure recognized. It is especially the case with our Dictyopteris rubella of Murphysborough, as also with the leaves of Whittlesey elegans, Newb., of Ohio. Sometimes the leaves of Neuropteris hirsuta have been heaped and compressed together in such quantity, that the pinnules are separable from each other as a carbonaceous cuticle, preserving traces of the primitive organism.

The shales, according to the amount of vegetable matter mixed in them, and the depth at which they have been formed under water, are of a more or less dark color; whitish or yellowish when of fresh water origin, and with few remains of plants; black and generally more homogeneous when formed in deep
water, and having for a larger proportion of their compound, broken remains of organized beings. In this case the remains are either animal or vegetable mixed together, both fragments of moluscs and fishes with fragments of plants recognizable on the same piece of shale, or mere remains of animals or only plants. These various appearances are easily explained in considering the phenomena accompanying the formation of the coal strata, from deposits analogous to those of our existing peat bogs. For the surface of these bogs, even in our time, shows the same differences in the superposed deposits; according to the depth and chemical compounds of the water by which they become covered, either by casual inundation in the interior of the land, or by slow immersion near the borders of lakes or sea shores. Even where the coal and shales, from the amount of remains of fishes which they contain, appear to have been formed in water of a certain depth, the matter always bears evident traces of its origin from land vegetation, and never from marine plants. The lower part of a bed of coal, worked near the mouth of Yellow creek, Ohio, is a kind of cannel coal, or very bituminous compact shale, full of the remains of fishes, whose entire skeletons vary in length from one inch to one foot. Yet this shale has an abundance of the remains of land plants mixed in its compound. The same case is observable in Kentucky—for example, at Airdrie, on Green river, where the upper coal (No. 11 of the Kentucky section,) is overlaid by a bituminous laminated shale, containing teeth of large fishes with trunks of *Sigillaria*, *Lepidodendron*, etc., and branches and leaves of ferns. Those who have examined our immersed peat bogs along the shores of New Jersey, have seen in activity a formation of the same kind, where logs of large trees are fished from a depth of ten or fifteen feet, out of beds of peat submerged in water deep enough to feed a variety of fishes; while here and there, small islands, half floating fragments of wood or heaps of mud, are covered with a luxuriant growth of ferns, reeds or bushes, which throw their debris to the surface, to be conveyed to the bottom and there mixed in the bed of mud, an incipient shale, with animal remains.

Among the various metamorphoses to which remains of plants have been subjected in the shale by compression, decomposition and other chemical and mechanical agencies, one peculiar phenomenon is worth noticing here. In the shale covering the bed of anthracite of Rhode Island, the whole carbonaceous matter of the plants has been destroyed by heat, and the mere skeleton of the leaves and other remains is marked upon the shale as a more or less distinct mould, often covered by a whitish inerustation of selenite. In this process of fusion, the vegetable fragments have been distorted in such a way that they often present an appearance far different from that of the species to which they belong. For example, in some branches of ferns, the leaflets have been, on one side of the pinna, extended to double their original length, and narrowed
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T. P. R. L. C.
Dr. Cuvier's account continued:  

The surface of the shell is smooth, but the inner valve is covered with minute, round, yellowish, translucent dots, which form a regular network. The outer valve is marked with a series of concentric, circular ridges, which are more pronounced on the anterior than on the posterior part. The hinge line is defined by a series of teeth, which are more pronounced on the anterior than on the posterior part. The siphonal canal is short and narrow, and the aperture is oval, with a circular margin.

The shell is divided into two equal parts by a strong median line, which is more pronounced on the posterior part. The posterior part is slightly concave, and the anterior part is slightly convex. The aperture is oval, with a circular margin. The siphonal canal is short and narrow, and the aperture is oval, with a circular margin. The hinge line is defined by a series of teeth, which are more pronounced on the anterior than on the posterior part. The siphonal canal is short and narrow, and the aperture is oval, with a circular margin.

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in proportion, while on the other side they have been relatively contracted and widened. Without an examination of the shale at Newport, it would be difficult to account for such a metamorphosis. At this locality, the shales present along the shore a series of low undulations, resembling slightly elevated waves; and there one can see that, in the state of fusion of the whole mass, the remains of plants, following the force of upheaval, have been, at peculiar places, drawn upwards and therefore elongated on one side, and of course drawn on the other towards the rachis. It is peculiar that the rachis and stems do not show any appearance of flexure and of deformation, and it is remarkable also that the same phenomenon of dimorphism is not observable on the plants found in the shale of the anthracite basin of Pennsylvania, where the flexures of the veins of coal are often abrupt, and where traces of tortion are frequently seen upon fragments of the combustible mineral. This deformation of vegetable remains may give an idea of the difficulties encountered by the palaeontologist in studying, as he has to do, mere fragments of plants in their fossil state. Not only do these remains generally insufficiently represent the whole vegetable, but often they are deformed by various forces and influences, to which they are subjected in the process of mineralization.

§ 3. VEGETABLE REMAINS PRESERVED IN FERRUGINOUS CONCRETIONS.

As far as we know, from the specimens abundantly found in Illinois, the mode of preservation of fossil plants in concretions is somewhat different from what it is in argillaceous shale. These concretions are found, especially in the shale of Grundy county, irregularly scattered from top to bottom of the strata, in the form of oval, more or less elongated, generally slightly flattened concretions. They appear to have been formed by superposition of concentric layers of slowly deposited carbonate of iron or ferruginous clay around central nuclei, which are most commonly parts of plants, bones of fishes or the remains of insects and crustacea. Their size and form vary according to that of the body around which the deposit has been made. Some small leaflets of ferns are found in nodules which are not larger than a walnut; pieces of calamites are enclosed in cylindrical concretions varying in length from two inches to one foot or more; pinnae of ferns or of Asterophyllites have been discovered in flattened concretions measuring about one square foot and only two inches thick, their form agreeing more or less with that of the body around which they have originated, though always showing an oval or round outline, by superposition of concentric layers. It is not yet clear whether the flattening of some of the specimens is the result of compression. Generally, the nodules which have cylindrical pieces of stems, or nutlets for nuclei, are round or exactly oval, while they
are flattened for pieces of ferns, in proportion to the breadth of the fragments which they have entombed.

The origin of these concretions has been explained in admitting a general tendency of some mineral bodies to concentrate around centers, whether solidifying from fusion, solution or vapors. (1) This explanation may be satisfactory in regard to other kinds of concretions, but from their peculiar position, their form and size, varying according to the nature and outline of the bodies which they contain, the nodules of Mazon creek rather seem to be the work of infusoria or Bacillaria concentrating molecules of iron around some centers, as it now happens in the formation of the bog iron ore, or in other deposits, in springs or pools, whose waters contain a solution of iron. This supposition appears confirmed by the manner in which the bodies in concretions have been preserved and selected for preservation. Though generally mere fragments, their integrity is complete, and yet some of them are of very soft texture.

The pinnae or leaflets of ferns are always found in them in a flattened position, their axis or rachis extending through the center of the elongated nodule, with the divisions on both sides; the surface of the pinnales, slightly swollen, as when in their living state, is marked by recognizable hairs or fruit dots, with distinct veins and veinlets, and their appendages, like the scales, are seen in the various modifications which they present in living specimens; for example, long, straight, flat, diverging, on primary rachis, and becoming shorter, ruffled and curled on their upper divisions. The small organs of plants appear, therefore, in a better state of preservation than in the shales. With small animals like crustaceans, scorpions, insects of a fleshy and very delicate texture, the preservation of form is still more remarkable. They are found entombed in the middle of the nodules just as if they were in life, or as if they had been transformed into stone while still living. The fruits or nutlets are not flattened. By the section of the nodules, which generally break into two equal halves by hard strokes on their edges, the middle and internal part of the fruit is exposed to view, while the outside surface is immersed in the stone. The numerous cones also of Lepidodendron found in these concretions are equally well preserved, either whole or in part, by horizontal cross sections. Some specimens not only show distinctly the pedicels of the sporanges and the blades in their natural position, but even sporanges with their seeds have been found in them, without perceptible alteration. In the cross section of these Lepidostrobi the sporange cells form a central row, which is surrounded by the blades in the form of a star.

Peculiar species of plants and animals, or their fragments, seem to have been selected as the nuclei of these nodules. They contain, for example, an

A continuation of the previous text...
...
2. Sigillaria Seili, Bridge, p. 466. (3) Bledenda Seili figure, p. 381. There is no larger specimen described in the "Catalogue of Plants." This one is a fragment of a small, short, and two-cent broad with very distinct arrangement of leaves. The "Bledenda" (patria) is sunny and elevated, with the submedian plant in quinase, 4½ by 5 millimeters thick, 2½ by 3 millimeters in vertical space. The "Sigillaria" seems to have a round, rather large, round yellow disk immersed at the base of the plant, having to the half size of the base, and not the whole transverse plane. 2 feet 6 inches in vertical distance. The upper leaves are 1 foot 9 inches in diameter. As they are round and oval, it is easy to see that this is one of the species of Bledenda. Which says that this is one of the species, the most old and the Sigillaria and that the intermediate between Sigillaria and A. Bledenda. That one may be in doubt about the place which it might occupy. Comparing the specimen to that of Bledenda, figure, pl. XXI of the "Flora" by Mrs. Collett, the genus of Bledenda is the exact one of this specimen, and the Sigillaria of Sigillaria. The small specimen gives the evidence of the nature of the leaf, of Bledenda, proving that they are long, easy, probably flowering, and already in small branches and not the mass of a few feet or the small axes, having at the base the familiar feature, perfectly distinct and placed along the rays, upon one specimen. The other, though of the latter, is in the rays with the enlarging of the stems primary, proving the form. The Goldenberg, figure 6 of pl. VII of his "Flora," is almost exactly like Sigillaria continued, p. 464.
abundance of leaflets of various species of Neuropteris, especially N. hirsuta, of Alethopteris Seriti, of Pecopteris villosa, P. abbreviata, Hymenophyllites Clarkii, Annularia longifolia, Stigmarioides, etc., which are either rare or have not yet been found in the shale at Morris, while these shales are rich in the remains of Odontopteris Scholethimii, Alethopteris erosa, Ulodendron, Carpolithes multistriatus, scarcely or not at all preserved in concretions. As the bank of shale bordering the bed of Mazon creek has not yet been opened, these differences may result from geographical distribution. Yet, as the animals and plants of soft exture, like the species of the genus Sigillarioides, have not yet been found in the shale of our American Coal Measures, it is evident that these remains have been generally destroyed by maceration, and only escaped total destruction by their entombment in these nodules. The same can be remarked on the remains of small animals. The remains of fishes found in these concretions are merely bones, scales and coprolites, while of molluscs, they have afforded only some agglomerations or very small shells.

§ 4. VEGETABLE REMAINS PRESERVED BY MINERALIZATION OR TRUE PETRIFICATION.

This kind of fossilization is performed by slow infiltration of mineral matter into the substance of the vegetable, when in a soft state of decomposition. The phenomenon is produced either by a total destruction of the vegetable substance, for which sand, clay or oxyd of iron is substituted by infiltration, or by a slow, still unexplained mineralization of the vegetable substance, by silex or lime. By the first process, the whole texture of the vegetable is destroyed, except the surface, preserved as in a mould, which shows the original outline of the vegetable, and bears the cicatrices of the bark and other external characters, which often render it recognizable. These moulds, generally covered by a coat of coaly matter, are rarely flattened by compression, and mostly represent trunks or branches of large size, sometimes fruits of a hard consistence, rarely branches and leaves of ferns. They abound in the sandstone beds of our Coal Measures, and some of our new species of Lepidodendron and of Sigillaria have been described from specimens of this kind. In the second case of petrification, on the contrary, the surface or outside of the vegetables is generally obliterated, as if it had been more or less decayed while subjected to mineralization, while the internal structure is preserved in its minutest details, and so distinctly, that it can be studied under the microscope when lamelle of the fossils are detached, and polished thin enough to become transparent. Specimens of wood fossilized in this way, though often remarked in the Carboniferous formations of Europe, and very common in the more recent formations of
this continent, have rarely been found in our Coal Measures, and none as yet have been obtained, except from Southern Ohio and Northern Kentucky. Both these processes of fossilization have acted upon vegetables already separated from their support, and more or less decayed, or upon trees still standing or still living, when they were surrounded by the mineral substances which caused their petrification. Though not quite as abundant as prostrated fossil trunks, petrified standing trees are not unfrequently obtained from the sandstone of our Coal Measures. Near New Harmony, Ind., some petrified trees, varying in size from six to twelve inches in diameter, have been obtained from a sandy shale, and transferred to his museum in their standing position, and with their roots attached to the trunks, by my lamented friend, D. D. Owen. Though entirely metamorphosed into sandstone, their mould preserves remarkably well the scars of the point of attachment of the leaves, the wrinkles of the bark, etc., and show the gradual variations which modify the form of the cicatrices in passing from the stem to the roots. True petrified forests have been observed in banks of sandstone of the Coal Measures of Pennsylvania and of Kentucky. This phenomenon should, therefore, demand but a passing notice, if it did not give rise to some discussions concerning the mode and cause of dislocation or fracture of these fossil trees, and also concerning the causes and agents of their petrification.

Fossil trees, except when observed in their standing position, still half inclosed and sustained in the matter in which they have been originally buried, are always found in pieces or broken. This is observable as well in the fossil wood of the Carboniferous measures as in that so abundantly found in more recent formations; for example, in the Cretaceous and Tertiary beds of our continent. The fracture of the pieces is of two kinds: either irregular, in various directions, like the breaking of mineral substances produced by hard strokes, or horizontal, as if by a kind of cleavage, the separate pieces forming disks or regular cylinders of various length. Generally, in both cases the fractured surface is clean, smooth, distinctly angular, and showing that in most cases, at least, the breaking of the trunks has been effected after the fossilization. Prof. Goppert, who has visited the fossilized forests of Egypt, south of Cairo, and has published the result of his researches*, has found there the trunks subjected to a kind of multiple fracture, produced at various times and in various ways; some of the trunks having their fractured surfaces obliterated as if by decay, others showing on their fragments, still closely approached to each other, evidence of recent separation. He therefore explains their fracture as due to mere atmospheric influences, especially to sudden changes of temperature, which are not rare in those regions. This explanation could be admitted for

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*Der Versteinerte Wald by Cairo, &c.; Acad, der Weiss: zu Wien. vol. 33, 1858.
Sphagnum peckianum, Wie. The species is characterized by the following features:

1. The species is closely related to Sphagnum peckianum, but it differs in several respects. The stems are usually dark green to brown, with a slight pinkish tint. The leaves are linear, narrow, and generally smaller than those of S. peckianum. The thallus is usually more compact and less branched.

2. In S. peckianum, the leaves are usually reddish-brown, and the thallus is more open and branched. The stems are usually lighter in color, with a more yellowish tint.

3. The species is distinguished by its compact growth habit and its more intense coloration. The leaves are usually more pointed and the thallus is more tightly packed along the stem.

4. The species is commonly found in wet, acidic environments, such as bogs and swamps. It is also known to tolerate a wide range of environmental conditions, including high light levels and high temperatures.

5. The species is an important component of many wetland ecosystems, providing habitat for a variety of plants and animals. It is also used in horticulture as a soil amendment, due to its ability to hold large amounts of water.

6. The species is known to have a long lifespan, with some specimens living for several decades or even centuries. It is a hardy species that can survive in a variety of conditions, making it a popular choice for landscaping and horticultural applications.
of sand. It was not until the late 19th century that the first comprehensive surveys and excavations were conducted, revealing the extent of the ancient city and its various structures and artifacts. The ruins of the city are still visible today, with some parts reconstructed and others left as they were found. The city was home to a vibrant civilization that was able to adapt and thrive in its harsh desert environment, with a rich cultural and artistic legacy that continues to influence modern-day Arabia. Through the careful study of the city's remains, archaeologists have been able to piece together a detailed picture of its history, From the earliest Stone Age settlement to its rise as a major trading hub and its eventual decline, the ancient city offers a fascinating glimpse into the past of the region.
FOSSIL PLANTS.

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the irregular fragments of silicified wood, found in connection with our recent formations, and which, in some countries—in Arkansas and Mississippi, for example—are in some places strewn upon the ground in profusion. Agglomerations of silex are rarely homogeneous or regularly compact throughout. They are interspersed with fissures or soft veins which, when penetrated by water, expand under the influence of frost, and determine fractures in various directions. But fossil wood broken in that way is rarely found in our Carboniferous measures. Generally, the fossil trees of this formation, when separated from the mineral substances in which they were originally imbedded and petrified, show the fracture by horizontal divisions, as by cleavage, and when in a standing position, and taken out of the matter which surrounds them, they separate in disks of various lengths, and can thus be taken out in pieces, which superposed afterwards rebuild the whole trunk, without marks of any other mode of disconnection, but horizontal through fissures. In that way the different parts of the trees mentioned above, as found by Dr. D. D. Owen, have been taken out of the sandstone separately and replaced in their order of superposition, to rebuild the vegetable in its original position. At Carbondale, in Pennsylvania, a true forest of Catamites has been crossed in the opening of an inclined tunnel through a bank of sandstone to a bed of coal underlying it. The fragments of petrified stems taken out of this passage are in such abundance that they have been used for the construction of a kind of gangway for running the coal cars out of the mines. These fragments, nearly without exception, are mere disks, varying in length from one to four inches, without relation to the size or diameter of the stems, which measure from three to six inches; the differences in the length of the sections being as marked for the large as for the small stems. All these fragments represent only as far, at least, as I could determine from the examination of hundreds of specimens, two species of Catamites: C. Suckowii and C. approximatus, Brgt. The walls of the tunnel are adorned by a number of these trees, still in their standing position and half imbedded in the sandstone. Though these stems are continuous, they show, at various and irregular distances, horizontal fractures where they break or are dislocated at their separation from the surrounding sandstone. Some of these trunks of Catamites, which in their natural state were evidently hollow, have been abruptly folded or crushed, like hollow cylinders in bending under their own weight, or by some external force; but even at the point of inclination or torsion of these stems, the fracture is horizontal or perpendicular to their erect position. At Paintsville, Johnson county, Kentucky, the bottom of the river, which at some places has been cleanly washed, is marked, as in a kind of irregular mosaic work, by the broken tops of large trunks of Sigillaria, still in their original standing position, all horizontally fractured. One of these trunks measures twenty-two inches in diameter. The same peculiar kind of horizontal
fracture is generally observable on the silicified trunks so abundantly found in some parts of Southern Ohio, especially in the bed of Shade river, near Athens. They are, most of them, pieces of stems of fern trees (*Psaronius*), varying in diameter from three to twelve inches, broken in disks from two to fourteen inches long. A few of these pieces of silicified wood are irregularly broken and disfigured on the outside by maceration; but generally they preserve their cylindrical form, and when of some length show here and there, at various distances, horizontal splits, uninterrupted all around the trunk, where a disruption is easily produced by a hard stroke. From the great bed of sandstone overlying the Pittsburg coal, near Greensburg, I have received, from Rev. W. D. Moore, large specimens of fossil wood, most of them long, irregularly broken, much decayed pieces, evidently representing sections of trunks broken lengthwise. These were found in various positions in the sandstone, and were mostly broken before they were imbedded in it. But among them there is one which bears, attached to a short stem, three diverging branches of its roots, a proof that it has been buried in its original standing position; and this one has its top horizontally broken and flat.

From these data and a number of others, which it is useless to mention, being all of the same kind, and bearing the same evidence, it appears that the fracture of the fossil wood is of two kinds: irregular, for trunks fossilized after prostration or in a decaying state, as they are generally found in our Tertiary and Cretaceous strata; and horizontal, by splits perpendicular to the natural direction of the stems and the roots. If the cause of fracture in the first case is, without doubt, essentially due to atmospheric agency, that of the second, which has acted upon the vegetable while it was still subjected to the process of petrification, is certainly different, and can be explained, I think, by the difference of density of both the surrounding mineral matter and the imbedded vegetable. Evidently, all the stems in the process of fossilization have been subjected to a softening process of their whole mass. The outside pressure of the surrounding mineral matter must have been felt, and can have acted only in one way, that is, vertically, as it happens in the forcing of a body of less density out of water; and the result of that action cannot but have been a tendency to dislocation, and therefore to splitting of the trunks in a horizontal direction. It might be supposed, perhaps, that a gradual accumulation of sand or other mineral matter around standing trees, in burying them, has formed layers of different density, whose action may have produced, in the fossil vegetable, zones of petrification also varying in density, tending, therefore, to cleave from each other, and horizontally separable. But the roots of fossilized trees which tend downwards in an inclined direction, or even are nearly horizontal, should be split in an inclined plane and not perpendicularly to their axis, as they are, at least, on all the roots of standing trees which I have had opportu-
A. 39. of a case specimen, a sketched p. 332, fig. 9. It looks like a long, linear capsule, 1.3 to 1.5 centimeters long obtuse or tubicate and slightly narrowed at the upper end. A little more than two centimeters in width, gradually narrowing and curved (hooked at the base when it is broken and slightly inflated) in the middle, showing like the fragment in the hooked instead. In middle from top to the base is irregularly very thin, striate, or both side. Blades are slightly twisted in right angle to the axis which is slightly come and indeed resemble to some fruiting capsule. It is distinctly comparable to my A. salicifolius case specimen and I believe that this may represent a fruit of the same genus, different which cannot be a Rhodora species.
It would seem as if the nature of genius of the wood subjected to destabilization might have had some influence on the nature of the agent which have caused mineralization. I have, in the following pages, alluded to the formation of the trunk of the Galipot. Now it is remarkable that a few of the trunk's specimens, which are, belonging to a very fine type, at least as much as could be seen from the specimen collected. How is it that all the other specimens are found? It is difficult to prevent for an extensive kind of vegetation in a place where locally undisturbed circumstances which have their influence on the white extent of the cool measures by great abundance of minerals. Indeed, in the soil of the Cal, though the remains of pears are abundant, we never find them separately, or in themselves, without being mixed with other. In this sandstone, this same pear will strike to observe. All the trunk's trunks formed in sandstone are fossilized. Magnes, Lepidolite, and many of the ferric. It is possible also that these, rarer among the grey, grey from lumps of pears, and in the distribution of the wood of the Cal.
FOSSIL PLANTS.

In this image, the text discusses fossil plants, specifically mentioning the silicified wood of the Coal Measures of Ohio and other recent formations. The text explores the process of fossilization, comparing the theories of Professor Goppert and Professor Schimper. It explains that silicification could occur as a result of rapid mineralization during the emericaus stage, where the vegetable tissue is still soft and can be penetrated by mineral fluids. The text also references Professor Schimper's observation that the wood in which silicification has occurred should have been at a higher temperature and more abundantly saturated with silica. The text concludes with a comparison of the emericaus stage in Lignites beds in Germany and the silicified trunks of Southern Ohio, noting the differences and similarities between them. The text also mentions the Mahoning sandstone and its role in the preservation of these fossilized trunks.

or smaller quantity, extends from Athens southward, to the Ohio river, and in
Virginia, as far up the Great Kenawha river as Charleston, or about one hun¬
dred miles in a direct line. There is no trace of any volcanic agency in that
country. No disturbance of any kind is observable in the strata, which have
their normal, slightly-marked dip to the eastward; nor does the sandstone it¬
self indicate, in its appearance, by a variation of its compounds or of its density,
any trace of metamorphism. At Gallipolis, near the mouth of the Great Ken¬
awha, a number of fossilized trunks, still buried in the sandstone, are seen
protruding from the bank, in which they have been petrified in a prostrate
position. As these trees have been examined already by other geologists, and
mentioned as indicating a peculiar direction of a current, by which they have
been brought and deposited, a short account of them here may not be uninter¬
esting. There are five of them, from four to fifteen inches in diameter, their
length unknown, lying, two in a southeastern direction, one due east, and the
two others due south. The part seen out of the sandstone is much decayed,
the outer surface, where it is preserved, is covered by a coat of coal varying in
thickness from one-half to one-fourth of an inch. What is most remarkable,
and bears directly on the question of their petrification, is that they appear to
have been transformed into stone by different substances, showing a different
kind of mineralization. In one of these trees the internal texture has been
destroyed, and the woody tissue is replaced by a hard calcareous sandstone or
clay, separating in layers of about one-fourth of an inch in thickness. A second
is a compound of small crystals of iron flint, its interior being perforated
lengthwise by a number of irregularly placed cylindrical apertures, filled with
small iron crystals, forming regular stars of more than twenty rays. A third,
of which I have obtained large pieces, it being of smaller size, four inches in
diameter, is transformed into a compact, opaque, black silex, which does not
preserve any trace of organic structure. (1) As these trees, of course, have
been petrified where they are found now, it would appear as if different min¬
eral substances, held in solution in the water, had acted upon the woody tissue
in different ways, according to its nature. In any case, it is evident that the
petrification has been performed in various ways, by the slow action of the
liquids penetrating the sand, and not by the uniform crystallization of silica as
it is now produced in the hot springs of volcanic origin: This is more evi¬
dent, in considering silicified wood of our more recent formations. Neither in
the plains of Kansas and Nebraska, nor in Eastern Arkansas, nor in Missis-

(1) It is marked by inflated articulations, like a species of Anarthrocanna, Gopp., and
is as yet the only specimen found in our Coal Measures which might be compared to the
trunks seen by Prof. Brongniart in the coal mines of St. Etienne, France, and compared to
Biophytum

1) Biophytum (see for description of the genus, lyp., vol. 3, p. 548.
2) Biophytum (curvatum). May, now, be seen from the Holmby and Brande, compared with them, the leaves are three millimeters, slightly, in size, more rapidly diminishing in size, until they become short. The division (dichotomy) of the rapidly growing organ is referred to Asperulae, and not to the form, a eudicot. It may be compared to size of Biophytum. The leaf does not appear hard, at least though imbedded in wood. The surface is not, not with straws and hair, and then marked transversely by wrinkles, or loughened. It does not bear any trace of, or other organism. The pinnate of this leaf does not appear to belong to the Dugardia, at least it is not branched, and the surface is more distinctly wrinkled crosswise. This has the appearance of a slender rhizome, and may be one of the same species.
Selaginella - Fig.

Selaginella gracilis. A little more than half a millimeter. The stem is not very long, slightly flattened on half the length. The rhizome dichotomous, the principal one, as far as the primary stem, the dichotomous short, the upper one long, tapering and straight or much curved. The spores are not visible. The fronds are not visible. The fronds are not visible. The fronds are not visible.

1. Selaginella gracilis. A little more than half a millimeter. The stem is not very long, slightly flattened on half the length. The rhizome dichotomous, the principal one, as far as the primary stem, the dichotomous short, the upper one long, tapering and straight or much curved. The spores are not visible. The fronds are not visible. The fronds are not visible.
Fourth or fifth of radian size, marked on the surface by transversely rhomboidal scars whose outlines, only remain without any trace of vascular scars on any other branches.

1. Podostigma giganteum, [Fig. 1] cylindrical, slightly compressed, seven centimeters in diameter, thick and one half to three in the flattened direction. Marked on the somewhat angular rhomboidal scars placed spirally around the stem were resembling the scars of Sigillaria branches on rather of the outlines of their scars. There is there an interlocked structure, the line, the branch, and nuclei, but not just thought, now a less deformed as appeared by the compression of the stem. Another branch, however, small mere 13 of principal close branch on rather the circumference a branch, preserved in hand and age, the Middle Clay of the Coal-meal group. The line, as quite a regular in the large, green which characterizes for this group, the interposed deformed a deformed a less deformed by the contact to the clay, more the surface of the clay and the clay matrix of the leaf smaller a less deformed has become embedded and misplaced. The clay matrix of these scar in the clay preserve well the clay. As such, it appears that then organism might represent marine plant. It is however certain that the scar are not quite as regular a should to expect from that of Sigillaria a branch of plant of that size. They are, to my belief original organism of this branch but still imperfect in their character.
sippi and Ohio, where fossilized wood is found generally associated with a ferruginous argillaceous sandstone, is there any trace of volcanic agency. There is merely an evident relation of this kind of fossilization with the deposition of iron. In Ohio and Virginia, that part of the Mahoning sandstone containing silicified trunks, borders, and perhaps overlays in part, the area where the richest and most numerous beds of iron ore have been deposited. In the recent formations, the fossilized wood is generally associated with the red or ferruginous clay. Even in the small area occupied by our Post Tertiary formation at Barlow, Ohio, disks of silicified fossil wood of dicotyledonous species are found in a bed of red ferruginous clay, associated with species of shells of the genus *Anodonta*, entirely transformed into a compact mass of oxyd of iron.

§ 5. THE FLORA OF THE CARBONIFEROUS MEASURES OF ILLINOIS, CONSIDERED IN SOME OF ITS AFFINITIES.

As a whole, the coal flora of Illinois has, like that of our American Coal Measures, the general character of the Carboniferous flora of the whole world. It is well known that the representatives of this flora mostly pertain to a single class of vegetables: that of the acrogenous or vascular cryptogamous plants, containing the three families of *Equisetaceae*, *Filices* and *Lycopodiaceae*. The nodules of Mazon creek, where fragments of plants, even of the softest texture, have been preserved in their integrity, offered a good opportunity for examining the often proposed question: whether plants of a lower or of a higher order than those could not have entered into the compound of the coal, and, from a peculiar consistance of tissue, have been destroyed by maceration, without leaving any traces of their primitive forms. This has been affirmed, for example, of the *Algae* or marine plants, which have left their remains in abundance in the Lower Carboniferous and Devonian strata, and also of the small cellular vegetables, *Fungi* and *Lichens*, which, at the present time, live on the bark of the trunks and branches of our trees, and are also observable, in the same circumstances, in the Tertiary and Cretaceous formations. I have already remarked, that no remains of any kind of marine plants have as yet been observed in the concretions of Mazon creek.* This is the more noticeable, as some of them have for nuclei bones of fishes of moderate size. As the so-called *Fucoides* have also never been seen in any bed of shale overlying coal strata, it is reasonable to conclude that the remains of these plants have not contributed

*Since this report was written, two or three nodules have been obtained from Mazon creek, inclosing marine shells, one of which is an *Ariculopecten*, and the others probably referable to the genera *Mucula* and *Polyplemoropis* or *Macrocheilus*, and indicate that these Mazon creek shales were probably an estuary deposit, in which the remains of marine animals were sparingly intermingled with the fauna and flora of the adjacent land. A. H. W.
in any way to the formation of the coal. But this is not a sufficient reason for asserting their non-existence at the Carboniferous epoch. *Chondrites Colletti*, Lesq., collected from Lodi, Ind., and found in connection with a bed of limestone overlying a thin coal at the base of the true Coal Measures, or just above the mill-stone grit, like *Caulerpites marginatus*, Lesq., from an analogous station in Pennsylvania, are sufficient proof of the existence there of marine vegetables already of a high order. But marine *Algae* could not live in the low swamps where the coal was in process of formation, no more than they could live now on the surface of the peat bogs, even of those which extend along the sea shores. These plants had then, as they have now, a domain of their own; they have casually been brought to live upon a limestone formed under deep water, as the roof of a coal bed, but no remains of them could enter into its compound.

Of *Epiphyllae*, small *Fungi* or *Lichens*, as parasites of stems and leaves, the concretions of Mazon creek have also no trace. They have, however, in great quantity that peculiar small organized body, *Gyromitres Ammonis*, Gopp., which some European naturalists still persist in considering as a *Fungus*. In the nodules the white, shining, bony substance of this small *Serpulidæ* is better preserved still than in the shale, and the tissue of fragments of thick leaves, wherein it burrowed, is often perforated like a sieve, by the removal of this shell after the destruction of the epidermis.

The reason generally given for the non-appearance of remains of small, cellular, vegetables, like *Fungi* or *Lichens*, upon the bark of branches and trunks of the Coal Measures, is, that the maceration of the woody tissue and its softening has necessarily detached these small bodies from their place of origin. But if this was the real cause of their disappearance, small vegetables of this kind should have been preserved in the nodules of Mazon creek, as well as the small vegetable organs, scales, hairs, fruit dots, and even seeds of *Lycopodiaceæ*, which are as much exposed to separation and destruction by the process of maceration. We find, moreover, a large number of these small plants in the fossil remains of the Cretaceous and Tertiary formations, upon fragments of wood, which have been exposed, before their petrification, to maceration, just as much as the plants of the Carboniferous period. As these parasitic *Fungi* and *Lichens* are at our time of rare occurrence on ferns, as also on *Lycopodiaceæ* and *Equisetaceæ*, I would rather admit that their appearance is cotemporaneous with that of the exogenous plants, on which they especially thrive, and that species of this class, and also of *mosses* and *Hepaticæ* had scarcely any representatives in the vegetable world before the end of the palæozoic period.

*Prof. W. P. Schimper places it in species of doubtful affinity in his Pal. Veg., p. 144
In his Permain Flora, Goppert has it still as a Fungus.*

of the largest leaflet, which are numerous upon the same specimen, slightly decreasing upward and outward, pointed at the margin, entire, regularly distinct at the margin, constricted, narrow, deeply serrated in the upper margin of the leaflet, lateral veins joining it either nearly parallel or at a slightly declivous line, then passing nearly horizontally to the border which they join either straight to it or in slightly curving upward. The veins are thin but more distinct and distant than in the other species. 1/40 of an inch in distance, not generally simple, sometimes these from nearly parallel to one another, or from the middle outward near the margin. The border was apparently entire and the leaf turned more inward for the specimen is preserved with fragment of stem, one of them fig. 8 rounded at the base and unwrinkled evidently representing the base part of the leaflet. This species is related to *Fossil.*

Guppy, New Zealand, p. 190. fig. 7, 5 & 6, 41 & 1, 8 which has larger leaflet than *Fossils.* The leaflets were not joined, or at any rate as seen on one specimen.

2. "Fossils." Genus Hesperia, see vol. 1 Educ. Plant. 1841. 8. 153. This species differs from the form by its large size and at least 1/8 inch in diameter. The leaflets are constricted near the base, three and one-half to four millimeters broad, channel is the middle and barely lobed, by flat, being to which the veins are joined at right angles and nearly divergent downward. The specimen still shows, thinner than in the above species and more simple in form, joining the borders without any trace of a little section. The borders are smooth and very irregular. This specimen by examination is not preserved as in the former species. That these two subgenera to form species, not to form species, it is not possible to judge. No trace of any vein or any trace of a little section. The borders are smooth and very irregular.

3. "Fossils." Genus Hesperia, see vol. 1 Educ. Plant. 1841. 8. 153. This species differs from the form by its large size and at least 1/8 inch in diameter. The leaflets are constricted near the base, three and one-half to four millimeters broad, channel is the middle and barely lobed, by flat, being to which the veins are joined at right angles and nearly divergent downward. The specimen still shows, thinner than in the above species and more simple in form, joining the borders without any trace of a little section. The borders are smooth and very irregular.

4. "Fossils." Genus Hesperia, see vol. 1 Educ. Plant. 1841. 8. 153. This species differs from the form by its large size and at least 1/8 inch in diameter. The leaflets are constricted near the base, three and one-half to four millimeters broad, channel is the middle and barely lobed, by flat, being to which the veins are joined at right angles and nearly divergent downward. The specimen still shows, thinner than in the above species and more simple in form, joining the borders without any trace of a little section. The borders are smooth and very irregular.

5. "Fossils." Genus Hesperia, see vol. 1 Educ. Plant. 1841. 8. 153. This species differs from the form by its large size and at least 1/8 inch in diameter. The leaflets are constricted near the base, three and one-half to four millimeters broad, channel is the middle and barely lobed, by flat, being to which the veins are joined at right angles and nearly divergent downward. The specimen still shows, thinner than in the above species and more simple in form, joining the borders without any trace of a little section. The borders are smooth and very irregular.
The shale of the coal at Morris and the concretions of Mazon creek have furnished also a number of specimens of three species, or rather forms, of *Palaeoxyris*, a kind of organism which is considered by Brongniart, Schimper, and other naturalists, as a plant belonging to a higher class of the vegetable kingdom, that of the *monocotyledonous phanerogamous* plants. In describing these bodies, I have expressed my views on their nature. If the opinions of the European authors are right, we have already, from the lower part of the Coal Measures of Illinois, vegetable organisms of a class of plants, whose first appearance has been marked in the Triassic period. Though it may only effect their generic affinity, the presence of these bodies in the concretions of Mazon creek is the more remarkable that they are there associated, as in the Permian of Europe, with a quantity of animal remains, especially insects of large size, which have, as yet, not been discovered elsewhere in the Carboniferous formations.

There has been found in the Coal Measures of England and Nova Scotia, specimens of fossil wood, referable by their tissue, a compound of large woody cells or fibres, marked by vertical circular spots, to the Conifers or Pine family. It is remarkable that most of the fossil wood of our Devonian strata indicates the same characteristic form of cells, and that as yet, neither in Illinois nor in other parts of our true Coal Measures, no kind of branches, leaves, or petrified wood distinctly related to this order of vegetables, have ever been observed. The fragments described from a nodule of Mazon creek in vol. 2, p. 447, pl. xxxvii, fig. 3, of this Report, under the name of *Lycopodites asterophyllitefolius*, resembles, indeed, a branch of some kind of Conifer, but it is as well comparable to some species of *Lycopodiaceae*. We have also obtained from the lower strata of the Coal Measures of Illinois and of Pennsylvania, specimens of *Artisia transversa*, Sternb., a species whose affinity is still uncertain, it being considered by Dawson a Conifer, while most of the European palaeontologists describe it with the *Lycopodiaceae*. Our specimens are all transformed into sandstone, with no other part preserved but the mold, do not afford any light on this question. From this uncertainty as to the true affinity of these vegetable remains, and what is said above concerning other orders of fossil plants found in the Carboniferous strata, it would seem proper to conclude that the flora which has furnished the materials for the formation of our coal, and which covered the bogs of our continent at the Carboniferous epoch, was limited to a single group of vegetables, that of the acrogenous cryptogams. (1) The same

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(1) Prof. Goppert considers the genus *Sigillaria* as rather related to a gymnosperm family. Its relation with the genus *Lepidodendron* is too evident to permit this conclusion; the cones and seeds of *Sigillaria* have moreover been found in our Coal Measures, of the same character as those described by Goldenberg.
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remarks would seem also to authorize an affirmative answer to the often proposed questions:

1st. Does what we already know of the Coal Measures give us a just idea of the boggy vegetation of which the coal is a compound?

2d. Is the vegetation of the bogs of the coal a true representation of the whole flora of the epoch?

For though it is argued, with an appearance of right, that the whole flora of the Carboniferous time could not have been limited to that of the swamps, that a part of the land was high and dry, and as we have now, on our peat bogs, a peculiar group of plants appropriate to that kind of soil, and without analogy to the vegetation of our dry land, the same differences should have existed at the time of the formation of the coal. The contrary proposition, considered hypothetically, could be equally well sustained. From all appearances, the land, especially on our western coal fields, was, at the Carboniferous period, represented merely by a series of flat swamps, separated by lagoons, and therefore the whole vegetation of the land was essentially of the boggy kind. But, even if at this epoch there was any elevated land, the extreme atmospheric humidity should have forced upon it the same vegetation as that of the bogs, as it happens at our time in some parts of Ireland and Germany, where, under the influence of atmospheric humidity, peat bogs ascend on inclined slopes to the top of high mountains. Prof. Schimper says, in speaking of the ferns which constitute the essential vegetation of the coal formations: there is no other natural order of plants whose intensity of vegetation so much depends upon atmospheric humidity. Ferns are true natural hygrometers, whose individual as well as numerical development is always in direct proportion to the humidity of the climate wherein they live. Therefore, the land vegetation of the Carboniferous period must everywhere bear the same general character. A confirmation of this assertion seems also to be found in the fact, that even in the formations of great thickness of Nova Scotia, where trees are seen standing and imbedded at different altitudes, and where no coal is seen in connection with them, these trees are recognized as belonging to species, or at least to genera of the coal: Sigillaria, Lepidodendron and Calamites. But on the other hand, we have to account for the presence in the slate and sandstone overlying our coal strata, of various kinds of fruits or hard nuts, whose relation, for some of them at least, can not be traced to any species of the coal flora known by other kinds of remains: leaves, stems, etc. It is true that as fast as our acquaintance with this ancient vegetation becomes more intimate, some of these so-called fruits are recognized as peculiar vegetables of the coal, for example, some species of Trigonocarpum or Carpolithes, as tubercles of Equisetum, or as vesicular appendages grown at the end of leaves of Stigmaria. But an explanation of this kind can not be admitted for nutlets, representing
Dickson-Hall's work on the genus and species of the New Hall. Two specimens sent to me by Dr. Good of Buffalo from the chamber of New Hall have characters which agree with most of the species described of Hall. They are the internal moulds of cylinders, one 21 centimetres long, two centimetres broad at its. broader end, cylindrical but not so flattened, more flattened in the middle where it is four centimetres broad and one and one half centimetres thick, still narrowing toward the top, where it is five centimetres broad and three to four mill. thick. Therefore spindle-shaped.

The other specimen is broader and shorter. Its base three centimetres broad is flattened to one centimetre thickness. It is gradually enlarging upwards to its upper end, 13 centimetres from the base where it is broader and measures 7½ centimetre broad, and two and one half centimetre thick. It is also a spindle-shaped form but a broader specimen of the spindle. The surface of both specimens is equally marked by a series of even lines or narrow flat strips, irregular in the thinner, the lines of equal lineal value being the same breadth and thickness as the intermediate one and one fourth the vertical strip in the same direction. Generally one is both horizontal and vertical; the second of this type is more marked than the intermediate one and in that way we have a kind of check-board like the following.

The regularity is very great but not perfect. In these is sometimes the horizontal row more often distant between the larger rows, but it is nowhere remarkable enough. This is the character of Hall by the few Hall remarks in its description that the lines are sharp, linear, and in three or five degrees of breadth every fourth one being more deeply impressed or stronger than the others, while the central intermediate one is stronger than the adjacent two. In the longitudinal direction, there is also a slight angularity or greater prominence at regular interval of every eight rows. For this, and the cylindrical or spindle-shaped form these specimens represent.

D. circularis. But the broader and rounded specimen is an ordinary one in the description by slightly prominent ribs on certain at regular distance with the intervals slightly more convex, just as Hall describes. D. Conradii, while on the other side of trace of these ribs is marked. The form of the body is as in D. Conradii vertical, pyramidal, for the half which is left for the breaking in the part of, and apparently Mb. will help both the other species. Hence no hope in this case from the chamber of New Hall. The chamber of both D. F. Lellioti, and D. Conradii, I do not know other than there read that all three species of D. of Hall should be referred to the same. This may be the case. The one from specimens of Pt. respecting resemble very different.
Dielcyncteris Schenckger, Hoffm. Two specimens, Ma 5041 515 of Mam's field represent evidently this species. The first presents a single separate labellum with an erect terminal, unjulculated base, lanceolate gradually acuminate, 3/4 and long, nearly one and a half as long as the labellum with some angulation on all sides. The base is enlarged from C of 3. XXXII fig. 4, of Neuman. Except that the labellum is unjulculated at the base and somewhat fleshy, shaped otherwise, the labellum of Neuman. The second is exactly similar to fig. 4, only much smaller. It is the upper or terminal part of a single with three labellums connected, the second and lower labellum by means of the upper part of the first labellum. The labellum long, short, produced in the point of attachment to a brown capsule, the two nearly two and a half, one and a half, and just tip reddish in color. Except the size, the identity of the species is perfectly diagnostic in all the characters. The labellum is still longer, the capsule red, the capsule red, the capsule red, the capsule red, the capsule red.
an internal ovule or seed, covered with three different envelopes like those of *Trigonocarpum Noeggerathii*, of which a fine specimen from Mazon creek has been figured in this Report. They resemble fruit of palms, and have been referred by authors to species of *Cordaites* or *Noeggerathia*. Still less can it be proposed for winged seeds or fruits generally described under the generic name of *Cardiocarpus* and *Rhabdocarpus*. These fruits, whose place in the vegetable kingdom is still problematical to palaeontologists, are far better known from American than from European specimens, and their analysis can, therefore, be pursued with chances of more satisfactory results. One of them is described and figured in its whole, in the Arks. Geol. Rept., vol. i, p. 311, pl. 4, fig. 4, as *Cardiocarpus ingens*, Lesq. Another, still more remarkable, has been published by Dr. Newberry, in the Annals of Science, of Cleveland, May 1853, p. 152, N. 2, as *Cardiocarpus samaraeformis*. A third has been obtained in good and numerous specimens from the shale overlaying the coal of Coshocton, Ohio, by Rev. H. Herzer. This peculiar fruit, *Ptilocarpus bicornutus*, Lesq., (1) is composed of a small oval seed, pointed downwards, rounded or obtuse at the top, obscurely ribbed in the length, attached to the inside of an oval scale, elongated upwards, diverging at its base into two short horns and overlapping the seeds by its border. The seeds, though generally found connected to the winged scales, are easily detached from it, and indeed all the specimens which I have examined, show the seeds already half detached from the top downwards, and to prevent them becoming lost, I had to take them out of the specimens and preserve them separately. This connection of a small oval seed to one side of a winged scale, point out evidently the relation of this fruit and of others related to it, and mark their places as belonging, if not to true Conifers, at least to the Gymnosperm family. However peculiar they may be in their form, though different from seeds of the species of our time, it is scarcely possible to compare them to any other family of vegetables. As the seeds are generally found separate from their scale, a number of fruits of our Coal Measures are probably referable to the new genus, *Carpolitites multistriatus*, for example. For some of the numerous specimens from Colchester, Ill., bear evident remains of scales overlapping the seeds like a broad rim, more or less lacerated and partially destroyed, especially towards the point. And in the nodules of Mazon creek, where these seeds are preserved in their original form, they appear merely tumid in the middle, as compressed under a scale, and not cylindrical. *Rhabdocarpus clavatus* is, perhaps, also a seed of the same kind, as are evidently the species of *Cardiocarpus* published by Dr. Newberry, loc. cit., and many European species like *Rhabdocarpus mammillatus*, Artis, etc.

(1) As the name indicates, this new genus *Ptilocarpus* is established for the special description of winged fruits having an affinity to those of the Conifers.
I have said above that the relation of these fruits can not be traced to any other kind of vegetable remains, leaves, branches or trunks of the Coal Measures, but there is, I think, a remarkable exception worth mentioning here. The shale overlying the coal of Cuyahoga Falls, Ohio, where *Ptilocarpus samariformis* has been found with many others of the same genus, is, in some places, covered with a quantity of leaves of the peculiar *Whittleseya elegans*, Newb. These leaves, by their flabellate form, seem related to the genus *Salisburia*, while the nervation resembles that of a *Pterophyllum* or *Zamites*. I consider it very probable that some of the above mentioned winged fruits are related to these leaves, and that we have, therefore, two remarkable organs of species of the Conifer family.

It appears, therefore, that if the Acrogenous plants did constitute the essential part of the vegetation of the Carboniferous epoch, this vegetation had already representaties of the three essential classes of plants of our actual flora: the Phenogamous dicotyledonous, represented by Gymnospermes; the Phenogamous monocotyledonous, to which are referable species of *Cordaites*, *Nogeratheria* and *Trigonocarpum*, and the Cryptogamous, represented by the three families of *Equisetaceae*, *Filices* and *Lycopodiaceae*. And from all appearances, we have to admit the similarity of characters and uniformity of the entire flora of the Carboniferous period. For it does not appear that any of the species known from our Coal Measures have been transported from a distance, either by water or by the winds, and casually deposited in sands or clays of the coal swamps. The leaves and fruits are generally found in groups, a number of their remains being together, and covering a limited area, as if originating from trees or plants grown at the place around which these remains are spread, and, as it has been remarked above, all the species of fossil trees as yet examined from the sandstone, are referable to genera known from shale overlying the coal strata.

In pursuing the same mode of investigation, I have still to make some remarks on the affinity of our new species and genera of fossil plants from Illinois, in addition to what has already been said in the detailed description of each. As our table shows, by far the greatest number of our new species have been found in the concretions of Mazon creek, from which it is reasonable to infer that the preservation of many of these species is due to their mode of fossilization, and that the same kind of plants may have been constituents of the vegetation of the coal in other countries, though their remains have not as yet been found elsewhere. Of species of *Neuropteris*, for example, described and figured in the second volume of this Report: *Neuropteris Evenii*, *N. pachyderma* and *N. verbenaefolia*, all from Mazon creek, have been omitted by Schimper in his enumeration; and yet, though the two first have not been elsewhere discovered, their preservation is so remarkable, and their distinctive characters so
Obgoprhya quadricuspidata. S. H. Minn. fig. 1. The general description of this hydropsid
Peltigera right and sufficient also for the genus. However, for the form
of the frustules, see below, and for the vexation. The frustules are generally of
the form of Fig. 1, more deeply cut however. Sometimes as in specimen 5. the
frustules are longer, cut to near the base or even chitinous and separated at the
base, long and comparatively narrow, others otherwise. The possible veins of
the frustules are obliterated, the base looks hollow. Some have sometimes been
marked in my enlarged figure, though, at least, only once, not being
common. Sometimes, the base looks hollow, but it is very rare.

I have not as yet seen specimens of the species in American
specimen. Geyming's P. T. Rap. N. Y. from the Wet Stone of Indiana. The frustules
are of very large size, its branch is not seen upon the preserva which has appeared.

Parallel, secondary, veins as from 20 to 27 feet long. The rachis of the frustules is
very, 3 mill thick, cancellate, with short irregular veins, no trichotomy. The
parallel, secondary, veins are parallel equidistant (15-20 cent, turned or inclined upward), 60°
vein with a broad branch, channelled by the secondary, rigid, tendril. Primarily, the
common one, at cent long, gradually decreasing to the top, where they part to
frustules; hence these secondary, veins are really lanceolate. Frustules in an open
angle of decrease of 9 pairs, in primary, 2 cent long, yellow, their, 3 mill in long,
gradually decreasing to 9 that the terminal, veins have. The form, the secondary, one,
becoming slight at the base, which may be thought of the inferior, primary,
the lower dichotomizes gradually divided to 4 each, 5 pairs, 1 leaf cut & near. The thin
modulus, obviously, the other, 5-12 half round a ice with the membranes
will thow the very distinct vein, folding twice generally at the base 4 generally
vice. The species, is allied to "theepitae" H. H. Phoenicoflora, greatly differing
by the rachis, primary, leaf, and primary, frustule cut, nearly at top,
the base joined to the mantle along the line of division, in the membranes
the scarcely dichotoma, lobes. The rachis is perfectly smooth the surface of the leaf
near flat and the rachis, perfectly, distinct.
1. Macrostegia grandiflora. I have copied the remaining part of a length from No. 201. The figure is exact, but somewhat obscure and corresponds to the description of Dr. Knight, p. 333, especially to the figure in a letter, P. IX, 17, 16, 17. The car is very abundant in the Calamites, Calamites. The formation of them is in two or three pieces, which I have not seen. Though the description may be correct, it does not agree with the two rows of large round scars, one row larger than the other, smaller round scars, which seem to be the base of two kinds of car in seed. There are indeed two sizes of car in the specimens of Calamites, which should be compared. Some of these cars are somewhat curved, others quite straight. Schippe calls them leaves attached around the stem joined together and forming the axis, which have remained of the base are attached upon the滨边. The art of the ribs is simple, and very curved like the whole of the specimen by their curly, indented, closely set, in the 1st file, the surface best, in other places the ribs are slightly more distinct and not so much wrinkled upon the figure. Indeed, the ribs are almost alternated at the point, but in the 2nd centimeters. Schippe concludes the broad leaf is a leaf of branches. They are at the bottom round, round, and grow to the tubes, and directly the tubes in the stem, growing like the monthly leaved, or indented. They are exactly figured. Branches of Calamites ramify, ramify, rise, but do not have the branches with some of the growing leaves, which have some branches, their long attachment to the sides, and the small, can be seen in the figure, and the unattached of the car, but the shape of the car, see p. 419, 419.
FOSSIL PLANTS.

well marked, that their specific value is beyond question. The case is still more evident with Neuropteris verbenaefolia, with which we now have a more intimate acquaintance, from the discovery of a number of specimens, all found at Mazon creek. I mention only these species, not merely as a kind of vindication in favor of our American discoveries, but in order to secure points of comparison in considering the geographical distribution of the plants of the Carboniferous epoch.

No more evident proof of the truth of what is said above could be afforded, than the discovery in the nodules of Mazon creek of numerous specimens of organs, which have as yet scarcely been found elsewhere. The fructification of ferns and their rhizomas, are of this kind. Besides two of the species described in the genus Staphylopteris, we have, in nodules from this locality, seven fruiting species of Alethopteris, six of Pecopteris, with one Asterocarpus, most of which were as before unknown in fructifications. And if the fossil fruit-dots of ferns were not generally obscured, and their form and position indistinct, discernible only, as they are, through the substance of the leaves, we should have had for description a far larger number of fruiting specimens of ferns. When Prof. Brongniart published his justly celebrated Fossil Flora (1848), only three species of ferns, Pecopteris cyathae, P. hemiteloides and P. Miltoni, were known and described, with fruiting branches. No fruiting racemes, like those of a Staphylopteris, had then, nor have been found even now, after forty years of further researches in the Coal Measures of Europe.

Considering this peculiar scarcity of fruiting ferns, Schimper comes to the conclusion that, as arborescent ferns of our time are rarely fertile, the species of this genus, in the Carboniferous epoch, were mostly fern trees. I should be inclined to admit the same conclusion, especially in considering the number of trunks of ferns, Gaulopteris, found in the Coal Measures of Illinois, if the coal flora represented in the concretions did not indicate a proportion of fruiting branches nearly as marked as it would be in collecting ferns of our time in a given area.

It is peculiar that, though evidently belonging to herbaceous species of fern, there has not as yet been found any fructification of the genus Neuropteris. Leaves of Neuropteris hirsuta are the most abundant and the best preserved of all the remains of fossil plants in the nodules of Mazon creek, and yet neither here, nor anywhere else in our Coal Measures, has anything been discovered which might be considered, beyond a doubt, as its fructification. For the intumescence of veins or veinlets, often remarked on the surface of the leaflets of this and other species of Neuropteris, and doubtfully considered as produced by groups of fructification placed underneath, seems rather to be the result of some casualty of maceration of the leaves. A mode of fructification of this kind does not agree with that of ferns, and is rather comparable to the Osmundaceae.
of our time, which bear their fructifications either as separate racemes or on peculiar divisions of their fronds. The fructifications of species of the genus *Odontopteris*, so closely related to *Neuropteris*, are known for *Odontopteris Schlotheimii* and *O. Reichiana*, Guth. The fertile pinnae, not yet found in connection with sterile fronds, bear inflated, round leaflets resembling small bladders, which have no relation whatever to the intumescence of veins considered as the fructification of *Neuropteris*.

Still more than their fructification, the rhizomas of ferns have hitherto been unknown to palaeontologists, at least from the Coal Measures. Prof. Goppert has given, in his Foss. Farnkreuter, p. 91, tab. 33, fig. 1, the only fragment which as yet has been published by European authors, as evidently belonging to true rhizomas of the coal. In his Pal. Veg., Prof. Schimper has published, under the name of *Rhizomopteris*, two fragments of plants, *Selaginites Erdmanni*, Gein., and *Selaginites uncinnatus*, Lesq., which, from the spiral development of their branches, their ramifications and their scales, he considers as representing small rhizoma of ferns rather than *Lycopodiales*. I cannot agree, on this subject, with my celebrated friend. The plant published as *Selaginites uncinnatus*, Lesq., vol. ii, p. 446, pl. 41, of this Report, is too slender, and has too slender divisions to represent a rhizoma, even of a climbing fern. Its slender branches, rather pinnately placed, are not more curved in spiral than they may be in some of our species of *Lycopodium*, and the divisions are evidently pinnate, like leaflets, and not scattered like hairs. The plant named *Lycopodites Erdmanni*, by Geinitz, and which, as Prof. Schimper remarks, is different from *L. Erdmanni* of Germ., has, like our *Selaginites crassus*, the ramification and appearance of a *Lycopodium*, but from the examination of peculiar specimens of the same species, seen by the author, it seems to belong to a rhizoma. Even admitting that these two species represent climbing or aerial rhizomas, this small proportion of organs of this kind, compared with the numerous species of ferns known from the Coal Measures of Europe, would be unexplainable, but for our American species. For the concretions of Mazon creek, and only these from the whole extent of our Coal Measures, have furnished us numerous specimens of eight species of these organs, some of them referable to subterraneous rhizomas. It is, therefore, apparent that the organs of the ferns of the Carboniferous epoch were the same, and in the same proportion, as those of our time, but, that some of these, like rhizomas and fruit-bearing fronds, have been more generally destroyed in the shale on account of their soft texture.

The inflated subcylindrical base of a species of *Annularia* and of a *Lepido- dendron* are also two remarkable characters, not recognized as yet in the same kind of plants of the Coal Measures, and which we owe still to the peculiar preservation of vegetable remains in the concretions of Illinois. Species of the genus *Annularia* may have been represented in the swamps of the Carboniferous period by two kinds of leaves, according to their growth, either in water.
Calamodendron. (Calamites, approximatus.) I have a very fine small specimen from Mansfield, Mo., 361, which represents a species of the genus, as described by Dr. Poirier, 1 man. on Calamodendron and Calamites, and by Grand' Epuy. It is a branch 9 ctm. long, with an external caliper 9 to 16 millimeters. It is a branch 9 ctm. long, with an external caliper 9 to 16 millimeters. There is a broad enlargement at the base, 15 millimeters, with 15 articulations at unequal distances, from to 16 millimeters. The stem nearly conical above the base is enlarged at the 6th articulation, then again constricted to the 10th and then again enlarged. It is thus more or less distinctly straight at diverse points. The articulation, as deep, and distinctly marked, with 30 or more veins of branches, the surface interlaced with the articulation, is distinctly, and some half irregularly striate, the striae being either long thin interwoven with striae, or more equal at most continuous across the articulation. The articulation appendage a verrucose mound at the base, the principal vein about 1 millimeter, distance are interrupted with intervals of vein, their 6th lines, two or three between each irregular, old connected sometime, others, sometime about. – The internal caliper which has the face and appearance of a small branch of Calamites approximatus is bordered and surrounded by the border, appears flattened to a by a cross section by an amorphous, apparently woody band running the entire from three and an half 6-6 millimeters. The surface is flat, smooth or corrugated. There are only 3 meshes across by irregular, slightly perceptible, small, irregular, distinct corresponding to the articulation, and in the same direction. The few spaces should be figured. The Grand' Epuy a Calamodendron. There is not any concave dents in the conclusion of authors or their makers, Grand' Epuy does not mention any other Calamites, approximatus. I believe however, from what I have seen few specimens that this is a species of Calamites while the first described here is Calamodendron. No Calamites, approximatus shows any such irregularity or.
or out of it, like some of our actual water plants which have for their sus-
tenance in water peculiar organs, sometimes a mere swelling of their petioles, as
in *Trapa natans* for example, which disappear on the emerged parts. A like
lubulose, bladdery form characterizes the leaves of the species of *Stigmaria*,
whose long stems were sustained by these floating organs, and we could there-
fore easily admit a dimorphism of the leaves of plants which, like *Annularia*,
evidently lived partially in water. But the cylindrical form of the leaves of a
*Lepidodendron*, like those of *L. rigens*, cannot be explained in the same manner.
These leaves are evidently aerial organs, and by their form expose a new charac-
teristic not yet surmised in species of this genus, though it was already ob-
scurely marked by the position of the vascular lines seen in a different relation,
according to the plane in which their leaves have been flattened in shale.

The shales of Morris and Colchester have remains of small branches of a
*Lepidodendron*, referable to *L. elegans* or *L. gracile*, Brgt? one to two inches
thick, mostly dividing perpendicularly to their axis, bearing short flat leaves,
and so abundant that they fill the shale to the thickness of one foot or more,
extending and covering a large space. These remains, scarcely varying in
thickness, do not look as though pertaining to erect stems, but rather appear
like creeping branches, extending all around, like those of some of our species
of *Lycopodiaceae*. The roots of *Lepidodendra* are unknown as yet, and I be-
lieve that some species of this genus, heretofore considered as branches of trees,
are mere creeping stems, which, in some circumstances, only bear flowering
stems, or true *Lepidodendra*. It is the same with the genus *Sigillaria*, the
species of which I consider as fruiting stems of *Stigmaria*. It is easily con-
ceivable that large trees, like those of *Lepidodendra* and *Sigillaria*, could
not be sustained upon the soft surface of the swamps of the Coal period,
without a peculiar kind of support; and this solidifying process of the surface
could only be afforded by a vegetation like that of floating or creeping stems
of the same kind of plants. Some *Lycopodes* of our time, when growing in
swamps, *Lycopodium inundatum* and *L. elevatum* for example, cover the soft
ground with their interlaced creeping branches, bearing their rare flowering
stems here and there, out of the reach and influence of water. Many aquatic
plants of our time also multiply their stems, extending them in every direction
by constant division, and fill large basins, even small lakes, never bearing any
flowering stem until they have formed, by compact netting, a kind of support
strong enough to sustain them out of water for fertilization. This is the case
especially with some species of our mosses, *Hypnum Lycopodioides*, *H. fluóta*,
*Sphagna*, etc. Some of our species of *Utricularia* have two very distinct
modes of vegetation. *U. intermedia*, for example, has, in water, its stems infi-
nitely expanded and divided, sustained as they are by their utricles, while in
sand the same species has a simple stem dividing at the base into three
branches, true roots which still lower bear a few thread-like filaments, without trace of leaves or utricles. I have compared this kind of vegetation to that of *Sigillaria* of the Coal Measures, merely, of course, for the mode of development. Remains of *Stigmaria* fill whole banks of fire clay of our Coal Measures, to a thickness of from six to fifty feet, and no remains of *Sigillaria* have ever been found in this clay in connection with them. Prof. Schimper mentions an analogous circumstance from his observation on the Vosges sandstone (*Grauwacke Vosgienne*), whose entire strata are also filled with remains of *Stigmaria*, and where no *Sigillaria* is ever found. Roots cannot live by themselves, independent of any other kind of organs, and it is certainly impossible to explain the mode of vegetation, the form, the nature of the *Stigmaria* and its action, in considering it as a root. But admitting these plants to be the floating stems of species of *Sigillaria* to which they have been sometimes seen attached, their peculiar nature and mode of vegetation becomes explainable, and in circumstances where they are found in the Coal Measures, they are in perfect harmony with the general vegetation of that epoch, as well as with the end which they were called to achieve. As is the case especially with our floating mosses, these floating stems of the Carboniferous epoch have the characters blended in a kind of uniformity which renders them scarcely recognizable. All the *Stigmaria* bear the same kind of cylindrical, bladdery leaves, and therefore have all, though belonging to different species, the same kind of cicatrices upon their stems, viz., a circular, double ring, with a single vascular scar in the center. This peculiarity has been heretofore a problem to palaeontologists. Binney has seen *Stigmaria ficoides* as the roots of *Sigillaria reniformis*, Rich. Brown has seen the same *Stigmaria* as the roots of *Sigillaria alternans*. Prof. Goeppert has obtained a splendid specimen of *Sigillaria elongata*, with *Stigmaria* as its roots, and Prof. Schimper has the same *Stigmaria* at the base of a fourth species of *Sigillaria*, and the fossil trees procured by Dr. D. D. Owen, should be quoted still as a fifth species, *S. Owenii*, Lesq., bearing *Stigmaria* as its basilar appendages. This *Sigillaria* to which I have already alluded, has its mould preserved in perfect integrity with the scars of the stems, those of its base and those of the divisions called roots, fully discernible. The cicatrices of the stem have no affinity with those of any other species of *Sigillaria* hitherto known. They are double, horizontally distant from each other one and one-fourth inches, vertically three-fourths of an inch, formed of two transversely oval scars, close to each other, joined at the corners by a deep line, thus resembling in miniature a pair of spectacles. The small oval scars are about one-eighth of an inch across in their broadest diameter, deeply marked into the

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*W. P. Schimper, Terrain de transition des Vosges, p. 324.
4 Prof. Goppeert, in his *Permain*, compares it to that of the Prothallium of the mosses. There is a mere analogy of division of the branches; nothing more.*
Cordaite

2. I reddish branch or without base. No. 2. Heavy
flowers, has been described already, p. 370. 3. No. 3. Has a branch about 23 cm long

3. A reddish branch or without base. No. 3. Has a branch about 23 cm long

4. A reddish branch or without base. No. 4. Has a branch about 23 cm long
Distribution: For Cordaites

1. Leaves, inflexed at middle of the base, some amphitrichous, surface not markedly and of even outline. Stipules by 
Aeg. J. W. Linn. 1844. See note from "Aeg.

2. The base of the leaf is slightly narrowed. Edges of the same date. 1842.

3. Formed, leaves, narrow, to the base distinctly narrowed and set in

4. Scars of leaves, distinctly placed on the branches, with more or less a

5. Flowers in racemes, 

6. Cordaites, 

7. Cordaites, 

8. Cordaites, 

9. Cordaites, 

10. Cordaites, 

11. Cordaites, 

12. Cordaites, 

13. Cordaites, with cylindrical leaves, 1846 (13).
...
4. Conostis mao-koei, d. a. 100. In description 1490. 3. The carapace The maxilla is about as in the former species, from which it differs by its larger size, especially, and its more abundant, smaller, and more rounded lateral spines.

5. Conostis manihuk, d. a. 100. In description 1490. 4. The carapace, as seen from above, has a more rounded posterior angle, and the lateral spines are more prominent. The first and second thoracic segments are more distinctly marked. The second thoracic segment is more evenly rounded, and the third is more distinctly marked. The fourth thoracic segment is more rounded and the fifth is more distinctly marked.

6. Conostis mao-koei, d. a. 100. In description 1490. 5. The carapace, as seen from above, has a more rounded posterior angle, and the lateral spines are more prominent. The first and second thoracic segments are more distinctly marked. The second thoracic segment is more evenly rounded, and the third is more distinctly marked. The fourth thoracic segment is more rounded and the fifth is more distinctly marked.

7. Conostis mao-koei, d. a. 100. In description 1490. 6. The carapace, as seen from above, has a more rounded posterior angle, and the lateral spines are more prominent. The first and second thoracic segments are more distinctly marked. The second thoracic segment is more evenly rounded, and the third is more distinctly marked. The fourth thoracic segment is more rounded and the fifth is more distinctly marked.

8. Conostis mao-koei, d. a. 100. In description 1490. 7. The carapace, as seen from above, has a more rounded posterior angle, and the lateral spines are more prominent. The first and second thoracic segments are more distinctly marked. The second thoracic segment is more evenly rounded, and the third is more distinctly marked. The fourth thoracic segment is more rounded and the fifth is more distinctly marked.

9. Conostis mao-koei, d. a. 100. In description 1490. 8. The carapace, as seen from above, has a more rounded posterior angle, and the lateral spines are more prominent. The first and second thoracic segments are more distinctly marked. The second thoracic segment is more evenly rounded, and the third is more distinctly marked. The fourth thoracic segment is more rounded and the fifth is more distinctly marked.
stone, formed of an outer ring with crenulate borders, and a comparatively large oval or elongated vascular scar in the middle. The double scars evidently represent the point of attachment of single leaves, which, if they had any analogy of form to that of their base, should have been one-third of an inch broad, with round sub-cylindrical borders, and a broad, flat, medial line. The surface of the trunks is regularly and finely wrinkled in the length; the scars transversely and still more finely so. The cicatrices, in descending towards the base of the tree, gradually change their form. They first become united into one, forming a deep triangular depression, with a single oval scar at the bottom, and further down in reaching the divisions representing their roots, they become round, with a central vascular point, exactly like those of *Stigmaria ficoides*, though a little smaller. The divisions of the stem, at first inclined downwards, become nearly horizontal at the broken extremities, distant twelve inches from the base of the stem. The largest and best preserved of these trunks is, near its base, four to five inches in circumference, dividing there in nine cylindrical branches, the largest ones seven to nine inches in diameter, merely forked near the broken end, which is two to three inches in diameter. The smallest ones, five inches across, are simple. These divisions, though marked with stigmaroid scars, appear indeed like roots, but it is evident that species of *Sigillaria* have sometimes grown in sand, and I believe that, under such circumstances, their subterranean divisions have somewhat modified their form, and hence they become similar to roots, as do the stems of *Utricularia* when they grow in sand. It is to this kind of organs or roots of *Sigillaria*, that the fragments described in this report are referable, under the generic name of *Sigillarioides*.

From what is said of the relation of *Stigmaria* with *Sigillaria*, it is evident that though the forms of *Stigmaria* are much alike, and generally as yet referred to one species, viz., *S. ficoides*, Brgt., we have indeed as many species of *Stigmaria* as of *Sigillaria*. In his Permain, Prof. Goppert still describes *Stigmaria ficoides* with eleven varieties. I cannot see why differences, though difficult to appreciate, should be considered as specific for one genus and as a mere variation for the other. But botanical palaeontology is a peculiar science. It offers to its adepts mere fragments of organs, whose relation to a whole is mostly unknown, forcing him either to generalize, and to consider in one species a number of organs which evidently pertain to plants of various kinds, or to specify and to divide under divers genera and species, fragments which, if not evidently, at least often apparently, belong to the same vegetable. It is not surprising that opinions concerning these remains are often at variance and often modified, or that the student of these fossil remains becomes discouraged.

*I have never had an opportunity of publishing descriptions with plates of these remarkable trees. It may be done hereafter in the report of the Indiana Geological Survey.*
by the sterility of his researches. And yet it is to vegetable paleontology mainly that we owe our acquaintance with the surface of our earth at the various epochs. From it we learn the character of the various changes which have modified this surface, and the admirable harmony of all the phenomena produced in its successive modifications. This branch of science has therefore a fascinating attraction, as it opens to our view the treasures of a vegetation that no human eye has ever seen or can expect to see, except in their fossilized fragments, and it shows us that all the divers epochs have been constantly working to the same end: the preparation of a home for the human race; and this work has been constantly pursued in admirable harmony under the direction of a Supreme Intelligence.

§ 6. ON THE STRATIGRAPHICAL AND GEOGRAPHICAL DISTRIBUTION OF THE FOSSIL PLANTS OF THE COAL MEASURES.

European paleontologists, who have especially studied the fossil plants of the Carboniferous strata, Brongniart, Goppert, Schimper, Geinitz, etc., have admitted that the distribution of these plants is modified according to the age of each bed of coal, and that, therefore, the horizontal position of the coal strata may be recognized by species peculiar to each. These views, as it now appears, (1) have been advanced on theoretical ground, or are based on local observations which cannot be considered as furnishing conclusive proofs; for local modifications in the succession of species of plants may be the result of mere local atmospherical, or geographical changes, which do not affect the characters of the whole flora, and therefore the comparative distribution of the fossil species of plants of an epoch can not be ascertained, but from the examination of this flora over the whole extent of its domain. A question of this kind can certainly be examined in our country with better chances of a definitive solution, than in any other part of the world, for our coal fields are of vast extent, the disturbances of stratification are rare or uniform, easily recognized by geologists, and the identification of the coal strata is ascertained at different localities from stratigraphical evidence.

From the beginning of my researches, in 1850, on the fossil flora of our Coal Measures, they have been pursued especially in view of obtaining positive data, marking changes in the vegetable constituents of each coal bed, according to its age, and therefore of recognizing species of plants peculiar to each (leading species), which would serve for their identification. As my views on the sub-

(1) From the authority of Prof. Brongniart, in letters, 1869.
ject have been published at different times, with the modifications induced by
the progress of the researches, a summary of what is positively ascertained as
yet on the stratigraphical distribution of the vegetation of the Coal Measures
is not out of place in this Report. (1)

When researches are restricted to a limited area, or to basins of small extent,
marked differences are recognizable in the species of vegetable remains in the
shales, as well as in the essential vegetable components of each bed of coal. It
is, then, an easy task to ascertain the relative position of the coal strata from
the comparison of these remains. But when researches are extended over a
wider area, changes of vegetation, evidently caused by geographical distribu¬
tion, become more and more appreciable, some of the predominant species of a
recognized horizon disappearing at some localities, and giving place to others
of different characters. A glance at our table of distribution puts this in full
evidence. The coal beds of Morris, Colchester and Murphysborough, the two
first on the northeastern and northwestern, the last on the southwestern bor¬
ders of the coal field of Illinois, are recognized, from all evidence, as repre¬
senting coal No. 2, of the Illinois section, (in vol. 3, p. 6, of this Report) the
equivalent of coal 1 B, of the Kentucky Report. (2)

Though the general character of the flora may be considered as the same,
we find, by comparison of the species at Murphysborough, eight peculiar spec¬
ies; twelve only in common with Colchester and Morris, and twelve in common
with Morris only, or altogether, eight species proper, and seventeen in common
with strata of the same horizon examined elsewhere in Illinois. Colchester
and Morris have been more carefully searched for specimens and are nearer to
each other. They have seventeen species in common, while Colchester has
nine species not yet found at Morris, and Morris has forty-four species, with¬
out counting those of Mazon creek, which, as yet, have not been seen at Col¬
chester. The coal of Duquoin, considered as No. 5, of the Illinois section, and
the only one from which as yet we have in Illinois and from a higher hori¬
zon a number of fossil plants which can be used for comparison, has eleven
species proper, and seventeen in common with some or all of the other named
localities. Points of difference and identity are therefore as well marked for
this bed of coal as if it belonged to the same horizon as the others, and the
same differences are observable in the distribution of common or more pre¬
dominant species. For example, Neuropteris flexuosa is most abundant at
Murphysborough, and has not as yet been found at Colchester and Morris,
where Pecopteris villosa and Callipteris Sullivantii are the predominant species;
and these are but rarely found, or not at all, at Murphysborough. On the

(1) See, on this subject especially, Penna. Geol. Rept., p. 837; Amer. Jour. of Sci. and
Art, Nov. 1860.
(2) All these strata are here marked according to the Illinois section.
contrary, *Pecopteris unita* and *Pecopteris plumosa* are common at Duquoin and Morris, especially in the nodules of Mazon creek, and rare, or not recognized as yet at Colchester and Murphysborough.

From the examination of the table, one may easily see other points of difference between the species found at the same station, or of analogy between those of different horizons. Nevertheless, I am not, on this account, prepared to abandon, as an unsustainable hypothesis, the question of the stratigraphical distribution of the fossil plants of the coal, for the following reasons:

1st. In a theoretical point of view, it is scarcely admissible that at an epoch where the land surface has been universally, and at repeated times, modified by deposits, either of sand or of limestone, sometimes of great thickness, indicating a prolonged submersion, the flora, re-appearing after these terms of subsidence, has always been represented by the same species distributed in the same proportion. Atmospherical circumstances, indeed, are the essential agents in modifying the characters of a flora, and these circumstances have been apparently the same during the whole duration of the Carboniferous epoch. But the elements or components of the soil, or of the water where the plants have lived, have been evidently modified at different times, and even if the medium affording life to the vegetation had been repeatedly the same, some species of plants should have been lost or have somewhat changed their forms in these repeated and prolonged submersions of the whole surface of the coal fields. The destruction, or the first appearance of a species, either animal or vegetable, is the most difficult phenomenon to ascertain. Animal species, for example, seem to appear at once, and of far different kinds, in successive geological strata. But these strata are either composed of different materials, or have been formed in water of various depths, and under other varied circumstances. The changes of life, therefore, are local or casual phenomena, which generally represent a mere displacement of groups, and are of no account whatever in considering the first appearance, or the destruction of a single species.

2d. The fossil plants hitherto obtained from the Coal Measures of Illinois are mainly the result of local researches, too limited to serve as a basis for general conclusions, and it is only after more extended examinations, and more complete collections from other portions of the great area now occupied by Carboniferous strata in this and the adjacent States, that we may expect to obtain the data for determining, in a satisfactory manner, the distribution of the Carboniferous flora over the whole extent of our American coal fields.

3d. When this is done, we shall have sufficient proofs of a gradual change in the characters of the vegetation of the Coal Measures from the first appearance of land vegetation. The *Lycopodiaceous* plants, represented by the genera *Lepidodendron*, *Knorria*, *Ulodendron*, *Sigillaria*, etc., are already represented by
Plate with N. (37)

Fig. 1-3. Micromeri. Specimen in wax from a large number of specimens.

28. The following are the only forms described of the same species. "N. Ar. IV p. 396 a. (2)

Continuum. II LXX

Fig. 5-6. Holothuriae Solidula. II Rep. IV, p. 307. II XI f. 5-7.

Fig. 6-7. Holothuriae Helvota. II Rep. IV, p. 307, II XI f. 5-7.

Fig. 7-8. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 8-9. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 9-10. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 10-11. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 11-12. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 12-13. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 13-14. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.


Fig. 15-16. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 16-17. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.


Fig. 18-19. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 19-20. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 20-21. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 21-22. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 22-23. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 23-24. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 24-25. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 25-26. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 26-27. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 27-28. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 28-29. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 29-30. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 30-31. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 31-32. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 32-33. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 33-34. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 34-35. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 35-36. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 36-37. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 37-38. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.


Fig. 39-40. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.

Fig. 40-41. Holothuriae Helvota. II Rep. IV, p. 309. II XI f. 2-26.
Fig. 1. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

1. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

2. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

3. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

4. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

5. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

6. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

7. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

8. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

9. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

10. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

11. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

12. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

13. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

14. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

15. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

16. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

17. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

18. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

19. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

20. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

21. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

22. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

23. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

24. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

25. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

26. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

27. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

28. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

29. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

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59. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.

60. Lygodium Medull. Fig. 1. Lyg. Medul. Pl. LXXV.
large tree in the Devonian of Ohio; in the Upper Silurian and Lower Devonian of Pennsylvania, (1) and occur in abundance in the Chester group (Lower Carboniferous) of Illinois. Representatives of this family of plants become more and more predominant in ascending, and by the number of species, and the size of the trees, the group attains its full development near the base of the true Coal Measures, at the horizon of coal No. 2. The bed of shale overlaying the Sub-Conglomerate coal of Kentucky and Arkansas, appears generally as a compound of mere debris, especially the leaves of Lepidodendra. This coal, like that of No. 2, shows also, upon its horizontal layers, distinct remains of plants of the same kind. In Pennsylvania, the shale of the mammoth bed, which I consider as the equivalent of coal 2, is, in places, a compound of large pieces of the bark of Sigillaria and Lepidodendra, superposed in a thickness of one to two feet, like the leaves of a book. (2) At Cuyahoga Falls, Ohio, the shale of the same coal is, in places, a mere compound also of pieces of bark of Sigillaria, and in Illinois, as seen by our table, the remains of Sigillaria and Lepidodendra predominate in the shale of coal No. 2, and the place of this coal in the sandstone of Marseilles is marked by remains of large trees of the same genera.

Ascending higher in the Measures, the Lycopodiaceous plants decrease in number to coal No. 5, or to the Duquoin coal, which, from its vegetable remains, appears to be the equivalent of coal No. 3. of the Kentucky Reports. This family is here represented still by some species of Lepidodendron, Lepidophloios, by cones or Lepidostrobi of large size, and by a few Sigillaria of the Lepidodendroid type, viz.: Sigillaria sculpta and S. Brardei, which appear to be universal species of the Carboniferous epoch. In higher strata of the Coal Measures of the United States, species of Lepidodendra have not as yet been found.

In connection with the Pittsburgh coal, as with coal No. 9 and No. 11, of Kentucky, I have seen specimens of the two last named species of Sigillaria, but no remains of Lepidodendra. From horizons above the Pittsburgh coal, we know nothing as yet of the flora of our Coal Measures. But in Europe, Goppert, in his flora of the Permian, enumerates Sigillaria Brardei, and describes two new species, S. denudata and S. Danziana, which are nearly related to Sigillaria sculpta, Lesq., if not identical with it. The same work mentions also, as found in the lowest strata of the Permian Measures, Lepidodendron Veltheimianum, already present in the Devonian of Europe, and with us in the Lower Carboniferous limestones of Illinois, and with it he describes a

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(2) A shale of this kind is, by an abrupt flexure of the coal strata, thrown up near Trevor-ton, and exposed as a perpendicular wall.
few species of cones (Lepidostrobi) of diminutive size, indicating there the dis-
appearance of the large Lycopodiaceous plants which afterwards were not re-
presented in any of the formations of our earth.

The fruits described under the generic names of Trigonocarpus, Rhabdocarpus,
and Ptilocarpus, have as yet been found only from the Sub-Conglomerate coal
strata upwards to coal No. 2. They abound in the Millstone grit and the
hearth sandstone, as in the shale of coal No. 2. A few fruits of uncertain
affinity, and considered under the name of Carpolithes, have been observed
higher in the Measures; for example, Carpolithes fasciculatus, at Grayville, Ills.
As yet these cases are very rare.

As to the ferns, the distribution at different horizons is more striking in
considering certain groups or races, rather than peculiar genera or species.
The genus Neuropteris, for example, is equally well represented, from the Sub-
Conglomerate coal of Arkansas to the highest strata of Pennsylvania and Ken-
tucky, by Neuropteris hirsuta, Neuropteris flexuosa, and Neuropteris Loschii, all
species closely related by their peculiar nervation. These are, moreover,
universally distributed over the whole extent of our coal fields, and in Europe
two, at least, ascend to the Permian. From this group, Neuropteris tenuisfolia
is the only one which, appearing with the Sub-Conglomerate coal, has not as
yet been found higher than coal No. 2. Another section of this genus, espe-
cially comprising species of a coarse or thick nervation or texture, like Neu-
ropteris Clarksonii, N. varicinera, N. vermicularis, N. coriacea, N. psathyderma,
etc., is as yet truly characteristic of coal No. 2, none of them having as yet
been found above or below it. All the species of the genus Odontopteris ap-
ppear distributed from the coal strata under the Millstone grit up to coal No. 1
and No. 2. In Illinois, as in Pennsylvania, most of the species are found in
connection with the last bed. It is the same with the species of large, thick
leaved Alethopteris, A. lonchitica, A. Serlii, A. Mazoniana, A. Massillonis, A.
Owenii, etc. They form, with Callipteris Sullivantii, a ‘distinct and peculiar
Ahmet, which may be considered truly characteristic of coal No. 2. Alethopteris
lonchitica, has always been for me an essential leading species, and never, as
yet, has misled me as marking the horizon of the mammoth vein of Penna.
In the east, it is a most common species; it abounds also at Cuyahoga Falls,
Ohio; but it seems to disappear in some basins, as for example in Illinois,
where its place is taken by Alethopteris Serlii and Callipteris Sullivantii.

Of Pecopteris, the section which Brongniart separates under the name of
Sphenopteroides, and which Schimper rightly places in the genus Sphenopteris,
is the only one which may be considered as yet as peculiar to the lower Coal
Measures. Its species, Pecopteris Murrayana, P. charophyllodes, P. Newberryi,
with Sphenopteris latifolia, S. obtusiloba, and S. acute, are found in connection


LXXVII.


5. I. 1-7. Quadrangular. M. Recl. 4. 365° (2). Fig. 14 of Spec.

11. 12. 13. 14. 15. Comprehension of Genus, which should be described under the name. Figs. 11, 12, 13, 14, 15. Fig. 15, Spec. no. 1. M. Recl. 10, 11, 12, 13. Fig. 11 of Spec.


34. Lepidophylla. M. Recl. 16. 17. 18.


Fig. V. Fruit of Lepidocyrtus, larvatum, &c. from Rome, pl. XIII fig. 76.  
FOSSIL PLANTS.

with coal No. 2. *Hymenophyllites furcatus* has more generally been found below the Millstone grit, but it ascends, though rarely, to coal No. 2, where also *Hymenophyllites splendens, H. Schlotheimii* and some other species of the section *Aphlebia* are generally found.

As representative of the higher coal strata of Illinois, or of coal No. 5, there is no particular species to quote. *Alethopteris aquilina*, with *Pecopteris unita, P. plumosa, Cordaites angustifolia*, and species of *Lepidophloios*, are there represented by more abundant specimens than anywhere else, but remains of these plants have been also observed in the lower Coal Measures. In the anthracite basin of Pennsylvania, the highest strata are recognized by the presence of *Pecopteris arborescens*, which has not been as yet positively discovered in Illinois, the small specimens referred to it from a nodule of Mazon creek being too obscure for certain identification. This species, the most abundant of all in some localities of Pennsylvania, is found also in profusion in the red clay beds of Ohio, especially in the *grotto of flowers*, near Marietta, where it is represented by a slightly different form, perhaps a mere variety of *P. rubra*, Lesq. In Europe, it ascends to the Permian, where its characters, though somewhat modified, have been considered as specific by Goppert, who has named it *P. (Cyatheites) Schlotheimii*. It is there, as with us, associated with its large form *P. Cyatheus*, Brgt. The section *Cyatheites* of the genus *Pecopteris* is, indeed, of all the fossil ferns of the coal, the one which is, in some of its species, characteristic of the higher coal strata. But as yet these species are indifferently known, and therefore it is hardly possible to indicate them as peculiar to a certain horizon. For example, *Pecopteris polymorpha*, Brgt., abounds in the highest coal strata of Illinois at Grayville, and near New Harmony, Ind. It is generally like *P. arborescens*, a marked species of our upper Coal Measures, while *Pecopteris abbreviata*, which Prof. Geinitz takes as a mere variety of it, is common at Morris, Mazon creek and other places, always in connection with coal No. 2, and has not yet been observed in higher strata. The differences in these horizons, as well as in the form of the pinnae, indicate these remains as representing two different species, though the nervation is of the same kind. It is certain that, as the Lycopodiaceous plants of the coal decrease in the number of their representatives, as in their size, in ascending in the Coal Measures, they are proportionally replaced by ferns, either herbaceous or arborescent. This change is everywhere evident in the shale overlaying the coal beds, as in the coal itself. At Grayville, and especially at Springfield, Ill., where the upper coal is nearly 200 feet above coal No. 5, the lamellae of the coal bear a quantity of recognizable leaflets and branches of ferns, especially of the genus *Pecopteris*. The roof shales of the Pomroy coal in Ohio are thickly covered with remains of ferns, especially large pinnae, still bearing leaves of *Neuropteris flexuosa* and *N. hirsuta*. A bed of shale,
which in places underlies the Pittsburg coal, is also a mere compound of stems and leaves of this last species, and I have received from the highest coal bed of Kansas, which is considered by some geologists as belonging to the Permian strata, a large lot of specimens of the roof shale, which, like those from under the Pittsburg coal, contain leaves of the same Neuropteris hirsuta heaped in profusion, without any other species but N. Loschii.

From the horizon of the Pittsburg coal, we have from Pennsylvania two remarkable species, whose discovery is due to the sagacious investigation of Rev. D. C. Moore, and which, by their characters, appear related rather to species of the Permian, or even of the Oolite, than to those of the Carboniferous epoch. One is the peculiar Neuropteris Moorii, Lesq., Penn. Geol. Rept., p. 860, Pl. xix, fig. 1, related by the pointed form of its leaflets and their size to Pecopteris Whitbiensis, Ll. and Hutt., of the Oolite of England. The second is apparently a species of Schizoneura, a new genus of Schimper, represented as yet by only four species in the Trias and the Oolite of Europe. Our species is known only by small branches, one-fourth of an inch broad, striated lengthwise, like those of a Sphenophyllum, articulated at short distances, bearing at the articulations whorls of ten to twelve oblancoate obtuse flat leaflets, about one inch long, marked lengthwise by parallel thin veinlets. These leaflets appear distinct or unconnected to their base, which is marked by small, circular, distinct scars. No trace of a vagina has been observed as yet.

The presence of these peculiar plants in the higher Coal Measures of Pennsylvania may not be more conclusive, as indicating a distinct geological horizon, than are the numerous remains of insects, crustaceans, etc., discovered in the nodules of Mazon creek, and which have as yet their relatives only represented in the Permian. But I desire to make here only a record of facts, according to our actual knowledge, in regard to the flora of the Coal Measures, and leave to future discoverers the task of obtaining more reliable data for a definitive conclusion on the subject.

The examination of the geographical distribution of the flora of our Carboniferous strata, according to the suggestions of Prof. H. D. Rogers, in the preparation of the Pennsylvania Geological Report, proposes the solution of these three questions: 1st. What is the geological relation of our Coal Measures with those of Europe, in considering the vegetable constituents of the strata in both continents? 2d. From the same kind of researches, is the anthracite basin of Pennsylvania identical in its age and in the distribution of its measures with the great Apalachian bituminous coal basin of Ohio and Pennsylvania? And as a corollary: 3d. What is the geological relation of the sepa-

*Prof. W. P. Schimper has separated this species as the type of a new genus Lescuropteris, a separation already indicated by my remarks with the description of this species, loc. cit.
11. Paleonxir (Hemionxir) pleata p. no. Train Horn-D 184. All Rep. IV pl. 64 fig. 2.
15 p. Pasty the same enlarged to thin surface.
Calamites ramosus, Stev., vol. 481. a fine specimen like C. ramosus Brpt., but with the base of the ribs converging distinctly to the base of fronds, which are very small. The convergence is marked, O. approximately fr. by Jeh aon. After but not in Brpt.
rate coal basins of Western Kentucky, Illinois and Michigan with our eastern coal fields? The first two of these questions have been examined and answered in the Geological Report of Pennsylvania, pp. 839-842. Though new discoveries might now furnish some interesting details to the discussion, nothing has as yet been found in the Coal Measures, which might tend to invalidate the conclusions admitted in that report. The third question has been also considered from data obtained in the geological explorations of Kentucky, Arkansas and Indiana, and therefore I have but to add here a few remarks which are called for by the species recently found in the Coal Measures of Illinois.

We cannot expect to trace any marked differences indicating climatic divisions from the northern to the southern limits of the coal fields of Illinois. Local changes, as indicated from the table of distribution, can but be considered as casual, and not ascribed to any permanent or general thermal influence.

The relation of the Coal Measures of Illinois with the eastern coal fields of Pennsylvania, Rhode Island and Nova Scotia, is indicated not only by the common or more predominant species, but also by some rare and striking ones. The coal of Morris, for example, has, in common with that of Newport, R. I., *Pecopteris squamosa, Pecopteris unita, Odontopteris Schlothuimii* and *Astrophyllites kevis*; with the low beds of anthracite of Pennsylvania, *Callipteris Sullivantii*, *Neuropteris Jimbriata*, *N. rarincevis*, *N. Clarksonii*, *N. Desorii*, etc., and with the Coal Measures of Nova Scotia: *Odontopteris subcuneata*, a species not seen as yet in any other part of the coal fields of the United States. Some species of the eastern basin, like *Neuropteris Rogersi*, *Lesq., Odontopteris alata*, *Lesq., Alethopteris obscura*, *Lesq., Whittleseyaelegans*, *Newb.*, etc., have not yet been found in Illinois; but these are very rare species, discovered each at a single locality, as are some of the new species described from the coal fields of Illinois, and which may be found elsewhere hereafter. Illinois has likewise about 30 species known in the coal flora of Europe, and which have not been yet seen in the more eastern coal fields of America.

Of the common species of our eastern coal fields, not yet found in Illinois, none can be quoted but *Dictyopteris obliquea*, Bunb., locally abundant in the shale of the high coal near Pottsville, Penn., of Newport, R. I., and of the sub-conglomerate coal of Arkansas; *Sphenopteris artemisifolia*, Brgt., rare everywhere, sparingly found in the low beds of the anthracite basin of Pennsylvania and of the western coal fields of Kentucky; *Pecopteris arborescens*, already quoted; *Pecopteris Loschii* and the peculiar *Brachyphyllum obtusum*, Lesqx., both locally predominant in the anthracite fields. The near relation of the coal basin of Illinois with the other coal fields of this continent, is thus demonstrated by its fossil flora.
The number of European species recognized in the Coal Measures of Illinois do not change in any way the relation of the American Coal Measures with those of Europe. It remains now the same as I have presented it formerly (Penn. Geol. Rep., loc. cit.). If general affinity is ascertained by a large number of plants, either identical or closely related, geographical differences in the vegetation are indicated by peculiar species or races of ours, which as yet have not been observed in the Coal Measures of Europe. It is true that European paleontologists, though at work on the coal flora for more than a century, still discover species, either identical with or allied to some of ours, which were once considered as exclusively pertaining to the American coal flora; for example, a fimbriate *Cyclopteris* from a small anthracite basin of the Swiss Alpine mountains. But these cases are very rare indeed, and besides what is known from other parts of our coal fields, Illinois has now furnished a number of these peculiar types of vegetables, which render geographical disparity more appreciable. Of this kind are especially *Neuropteris verbeneifolia*, *N. Evenii*, *N. pachyderma*, *Dictyopteris rubella*, *Aethopteris hymenophylloides*, *A. inflata*, *A. solida*, *Pecopteris Strongii*, species of *Staphylopteris*, *Sphenopteris scaberrima*, *Hymenophyllites mollis*, *Schutzia tracteata*, a number of species of *Lepidodendron* and *Sigillaria*, *Syringodendron Porteri*, *Megalophyton McLayii*, species of *Caulopteris* and of fruits of *Paleoxyris*. Indeed, no genus of our coal flora, except, perhaps, *Calamites*, can be considered as represented on both continents by species all identical or closely allied. As these points of difference, like those of affinity, have been observed from the beginning of the researches on the coal flora, and have not varied much in comparative quantity, they appear to fully corroborate the statement that, at the Carboniferous epoch, the flora which formed the constituents of the coal, was in Europe and in the United States as different, and at the same time as relatively alike, as is now the flora of the peat bogs of the two continents.

* *Cyclopteris lacerata*, Heer., see descriptive part. The predominant species of this Alpine basin, which was for a long time considered as of a different formation from that of the Carboniferous epoch, is *Odontopteris Alpina*, Brgt., a peculiar plant, which, as yet, with us, has been found only in connection with the anthracite of Rhode Island.
General remarks.

1. In the hairs of Neumyces tursata Latr. This position is quite regular. They are mostly placed in the middle of the space between the middle row and the border. Their structure is generally smooth and round, and sometimes being turned more or less toward the center of the middle row, even, but rarely, perpendicular to the direction of the border. Their length is of various sized needles, about one inch in length, of the same thickness in their whole length, and pointed at the top. The large leafflet is generally covered with hair, the leaflet one, punched or waved. The more remarkable appearance of these hairs is that they all make upon the surface of the leaf, in a depression or as if cut into the substance of the leaf, and not as placed upon it as an elevation as it should appear if they had grown upon it. This can not be explained, but in supposing that they were of a harder substance, joined to the matter of the leaf, they have produced the appearance and have begun to form it, and attached to the clay where the bottom part of the leafflet is flattened. They have made upon the surface of the leaf, an impression, and equal to that is not left upon the surface, that the hairs were upon the inside of a leafflet (for of it was the case), their presence should be imputed. The leafflet and not the depression, through the substance of the leaves, cutting their form from the leaf, and being detached by maceration, has been glued to the clay, covering the surface of the leafflet. To be so distinctly made upon, the clay forming that the impression is of leafflet No. 217 (1871). The appearance made upon the surface of the leafflet could be explained also in supposing that by being, being in the upper surface and of a harder nature than the leaf, were fixed by cohesion included in the substance of the leaves, and further totally by means of having only the piece cut into the leafflet to make with the outside covering clay. The shape of these hairs appear indeed as cut into the substance of the leaf, all others being flush and deep. The hairs are not quite similar, but slightly, thrown into the leafflet and are seen to well upon the borders of the leaf, and being detached by maceration

Some specimens have the upper surface of the leafflet and the clay impression resting upon it, separated by a thin coat of a white substance (gypsum). In this case, though the lips are free from the leaves of leaf, the clay covering has not the corresponding mode of as if they appear as plain and the edges of the veins and grooves being well matched without any trace of hairs. Better specimens than the veins, in the grooves from the veins and rather turned backways than towards the point. The powder under the leaves, substance being marked by grooves and not by smooth lines, upon the leaf, is impressed in the form of the veins of some species. For example in Rhyusa, Neumyces, the leaves are distinctly marked by grooves both in the leafflet themselves as the veins and upon the stalk covering them. The same if so much as been found by the addition of the result of the leafflet after maceration.
General remarks on the geology of the coal measures.

1. Amongst remarks in (part) on a memoir 2 Grand Bay, that the Carboniferous formations are not referable to a single epoch, but that we have recognized in them, for different geological position, which equally, if not more marked, difference in the ensemble of the plants which have formed them.

To all sorts of the carboniferous measure of France, we have to admit that those of the North (including the department of Maine, those of the Loire inferieur, place of the upper part of the Carboniferous, the same Mem. that these upper carboniferous meaning, show different species, by their plants, or different stages in the subject. Grand Bay remarks on Carboniferous Mem. p. 19.

The superficial abstrait, if multiplex comparison of our most favorite country ore. The attempt made by a poor author, and the extreme difficulty of these opinions, contrary to referring the plant, this by another. Le Siller.

If we, however, compare the plant of Wanstead, in which we have the whole of all the materials of value, & of color, or a comparison of the plant of Wanstead, to prove, how little the flowering is yet of the true character, of the plants, to coal companion, with the time of oen time.

Depend now, I am of sufficient means, compare in attempt, the plant, could be seen, but an exhibit of personal

I have, without any especial result. However, than the who, the plant, or, in the mean, the companion on a thither, is prepared especially, and they will very important, making figures, in the wall of companion, with more certainty. I have, however, tried to superpose faithfully the plants, a fragment of plant of the slant of Medoc, and them, afford a glimpse of reliable materials, for them who may continue this work in their research, the concern.

clandestine a peculiar period of view.

Remark, for the reproduction, to certain figures of the M. Papet, especially, that the figures have been, may carefully drawn by myself, and carefully engraved by the Optical Engraving Company. Chicago, and is known to the present, that for acceptance were the property of M. Delahaye, and engraved in the Plate, and may be sold or engraved that both. The certificate, hence been new, not mode, the figures, lost, and that the relief plate of the figures been are done by the Optical Engraving firm, see No. 4 (Papet) in the quotation. There, much quotes in the foregoing, or relate the aspect, which I have good-illustration of the trouble quoted, see No. 8 (Papet) remains,
The only regrettable fact, the number of plates, and figure could not be greatly increased. At least doubly, the number of plates would have been necessary, to perfectly represent all the scenes described. I have tried to compensate for the absence of figure by a series of carefully made descriptive figures, but no description is equivalent to a figure. And for the few, a most
necessary, I have endeavored to fill the spaces with the most characteristic and well-known objects.

5. I have purposely reproduced figures of the organ of flowers for the Nodule & Cones, etc. May I add, that the characters observed for the Nodule & Cones, were not the same as those of the Peculiar Nodules, when they appeared, nor not been found elsewhere. Hence, that these, of a roll type, generally destroyed by maceration on compression in the nodules, preserved at May Creek and for the researches, during five years, by Mr. J. Turner, so far one other, it is not probable that remains of the Nodule may be found elsewhere. They are of peculiar importance for demonstrating the rarity and value of the roll type, and also the few we know about of the flora. For example, the Palecolpophytes, Phymatophytes, &c., have all without exception been found in the cavities, also most of the peculiar organs of form.

6. Some figures, like these drawn on the microscope, may aid to show the character of a microscope. Then remain the Howardia, extremely rare, separate, or some genera all destroyed by maceration. They help to give us a clue to the mode of replacement of the real plant, and other facts, which might relate to the Carboniferous flora and expose some of its characters.

7. The plant fossil finds much for the geologist which could give an idea of the various characters of the vegetable which they represent. By an addition, e.g., leaves, which they by abundance is as called to explain, and what are equally insufficiently explained by the student. I am not at all disposed to enter into the nature of the value of the so-called pieces which I admit by the discovery of the plants, which I have studied. And I fully have to employ all the knowledge I have on my specimen for a full list of physical objects.

8. I have gone with the geologist, which the more important ignores, especially must omit, the author whose descriptions are illusory, described by figures. A number of species are not figured (e.g.,) some of the most important figures are found in China & India, which are well known in the family of every plant, and most of them also. Eocene of Cretaceous, are nothing respectively read that.
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In the Councils both the Tragulus are very rare. The
Mammalia and by which means capably very abundant.
September was again most abundant on the coast making this creature
the 15th one not only for the number great and for the development of the speculation.

Perhaps the company made a characteristic of some of the fine
air species to the advantage of the author, may be too lengthy
for too detailed. As we have been so largely engaged on company
there in all and necessary to allow the rest of the specific characters.
Which is here forced me to a separate a few identifying trees.
There are in the Narratives such a variety of America for acco-
and the following peculiar characters for off. its distinctive 4 day
number of species that at last right the multitudes may
appear untried and have been done which may be engaged
author to the beginning of my readers. And the after still a while
narrators. I have made a variety than species as yet for the theories.
The author has therefore disappeared and with few examples in the
attempted by myself all the species; the more acknowledge
as remarkable for peculiarity at least until near to the 15th
Measure. I should not think that the great variety is limits
to the figure. What in the 9th grammar found so is of
of the combined open air is sufficient to indicate that you
not introducing of the figure is too large number of members
there I have been but far too conservative and the in have
on how materially affects and peculiar characters for
their new climate generic and specific which will be
established by author hereafter.

There is a figure in a separate record perhaps will appear hereafter.
all the species known until now for the California and may
therefore supply the want of precious the maximum with which
second of the subject, I did not find the proper to omit the
nomination and the figures to the figures which have
her and in the preparation of the flora. The reference may
from the one necessary, this morning also who is to be read
at least in its most important chapter in order to show
the five species of the figure and to afford many companies.
that we have described to what is known in Oregon. etc.
The description of the species, of which I have given some figure, is as follows. The flowers are yellow in color, with a yellowish corolla, and are borne in large clusters. The petals are long and narrow, and the stamens are numerous and yellow. The fruit is a capsule, containing many seeds. The plant is found in the Carboniferous period, as mentioned in the figure.

The species of which I have mentioned the flowers is commonly called the Yellow-stemmed plant. It is a common plant in the Carboniferous period, and is found in many parts of the world. The flowers are large and showy, and are borne in large clusters. The petals are long and narrow, and the stamens are numerous and yellow. The fruit is a capsule, containing many seeds. The plant is commonly found in the Carboniferous period, and is a common plant in many parts of the world. The flowers are large and showy, and are borne in large clusters. The petals are long and narrow, and the stamens are numerous and yellow. The fruit is a capsule, containing many seeds. The plant is commonly found in the Carboniferous period, and is a common plant in many parts of the world.
It will not be, great I remark that there are described some fragment of sear which all give taken not certain too acknowledge. By my self in so count. I have not of my life to give an example of the
wonder what has been observed and several. In my one complete
of the coal plant of the third. Perhaps this fragment may be seen
beneath in bell glasacks with the relation galena. I do not con-
consider my fragment of coal plant amount of observation amount
and I am confident as the coal plant can be composed of the "
[Page 190] form Antitracas. Therefore feel, as, [Page 190]

20. I am that this will present a number of coal plant of type
specific eye green type coldman. In the case by left the review.
coal plant. Note least taking to suit for they is thickness
of the plant to have on Coalbank, I would conceive in a
author who not not ever had the opportunity to converse between
me with those fellow. Who is deprived of my mean of my
coal plant is an applied policy to put the power of
consideration to this I think about another possible fully with a
offered air you and I am it but unrelated. On one of the there is
ultrasound the igneous glass of the coal and as it is the color of the
explosion of a long arc of an year. Please one of the what related
of the coal plant to get them the manner of becoming acquainted
with the fowl fire. To all the pure evaluated in their perception
by all the other plant in the coal to them, the presence
of cabinet a mean in the geological etc.

And also, I have described the uncertain power for unfamiliar
when reference is given by me to the different cabinet when they
are troubled and composed. This [Page 191] is deceptive fully
from them I have less it one as I must I had to be
in the direction of my works. When I began the study of these

21. This whole left to future observations, presents the coal plant
is not much to wonder the reason what the world contains con-
was an interesting occasion that all the occur in complex
the description and giving a belt or location is frequently done
by the future end of these relate. To equally extend it
carefully thought the world fire, either for geographic or other
natural composing. I think I think the difficult but nowhere can be
expected to find material to approach the more or less
also notable men in the research of this kind.

22. I have described in the Coal Plant where connected with first position or last.
The separate of the coal plant and the down - is not pointing another other
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23. Observations.--In general, the features of the coal are best observed when the
sample is not subjected to the heat of a furnace. They vary in color from a light brown to a dark brown, and in
weight from 1 to 2 pounds. The coal is generally found in thin layers, often separated by a
vein of shale, and it is usually found in small pieces. The most common use of coal is for
fuel, but it is also used in the manufacture of coke and as a source of power.

24. A brief discussion of the coal's geographic distribution is
necessary. The coal is found in various parts of the world, including
North America, Europe, Asia, and Africa. The coal's distribution is related to
the geological history of the area, including the presence of coal-forming
environments. The coal's geographic distribution is also influenced by
local conditions, such as climate and geology.

25. In the importance of the coal's geographic distribution,
not only its geographic extent but also its environmental variations
must be considered. The coal's geographic distribution is related to
the coal's origin and the coal-forming environments.

26. In the importance of the coal's geographic distribution,
not only its geographic extent but also its environmental variations
must be considered. The coal's geographic distribution is related to
the coal's origin and the coal-forming environments.


Mention here the species which are in danger of extirpation, &c. &c., &c. 

The name of the Insectivora, &c. &c., &c., of the Scorpions, &c., &c., &c.

E.g. but yet forms in Europe, &c., &c., &c.
19

Count number of species, described and number of those figured as why the
consistency of descriptions not only to supply the absent figure, but drawn
order of the different forms observed by long examination of specimens
which can not be all separately figured

20

If I had been the proprietor of the place which belongs to the living Anna. I
have devoted to the two extensive fields which have been ceded to me, the
north and have given me complete and trenchant bearings, the distance,
tagore and the fourth of the town 3½ miles. Without the assistance
and conduct pronounced I would never have been furnished with the

...
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ERRATA.

Page 29, 15th line from bottom, for “old” read older.
Page 30, 15th line from bottom, for “positions” read portions.
Page 97, 16th line from top, for “southwest” read southwest.
Page 194, 16th line from bottom, for “Cephalanthus” read Cephalanthus.
Page 316, 16th line from top, for “diwuelf” read diwuelf.
Page 213, 15th line from top, for “southeast” read southwest.
Page 346, 16th line from bottom, for “Tamarack” read Tamarack.
Page 359, 17th line from bottom, for “bevelled” read beveled.
Page 369, 1st line, for “are” read one.
Page 360, 12th line from top, and 361, 4th line from bottom, for “bevelled” read beveled.
Page 381, bottom line, for “enameled” read enameled.
Page 388, 12th line from bottom, for “divisions” read divisions.
Page 399, 16th line from bottom, and bottom line, for “Bouagnari” read Bouagnari.
Page 409, 7th line from bottom, for “coracoids” read coracoids.
Page 403, 6th line from bottom, for “Versteineringen” read Versteinerungen.
Page 429, 6th line from bottom, for “Sphenopteris” read Sphenopteris.
Rhylia a se sequum remota: (Abbr. 3956) leaflets at a distance from each other
Dichotoma: fere in numero duo generis.? Sp. Natureu, vera se multo fortis, foliis bis ter et
Richetum: in Podostemum alpinum, in utriusque dichotomia, de. Richet to dichotomia
Fimula pingue in rachis prima, primus interpositus, leaflets attached to the
rachis between the pairs.
Sketches of plant described in notebook.
Sagomacippus

Fig. 1

Carbolles

Fig. 2

Fig. 3

Carbolles

Fig. 4

Fig. 5

Carbolles

Fig. 6

Carbolles

Fig. 7

Carbolles

Fig. 8

Carbolles

Fig. 9

Carbolles

Fig. 10

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Fig. 11

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Fig. 12

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Fig. 13

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Fig. 14

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Fig. 15

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Fig. 17

Carbolles

Fig. 18

Carbolles

Fig. 19

Carbolles

Fig. 20

Carbolles

Fig. 21

See commentary p. 1531.
Cotoneaster, generally distributed in the northern hemisphere, is a genus of flowering plants in the family Rosaceae. The species are adapted to a wide range of habitats, from open woodlands to rocky cliffs. The leaves are usually opposite, with a single flower at the leaf base. The fruit is a bright red drupe, often surrounded by a colorful calyx. The genus includes both deciduous and evergreen species.

The flowers are small and white, appearing before the leaves. The spreading branches and the attractive red berries make Cotoneaster a popular choice for gardens and landscapes. Several species, such as Cotoneaster horizontalis, are cultivated for their ornamental value.

In terms of reproduction, Cotoneaster species exhibit both self-pollination and outcrossing, with the latter occurring through wind, insects, or birds. The distribution of Cotoneaster is widespread, with species occurring in Europe, Asia, and North America. The genus is particularly diverse in the regions of the Northern Hemisphere, with a notable absence in Australia and Africa.

Cotoneaster species are often used in hedge planting, as they grow well in a variety of soil conditions and can tolerate moderate drought. The genus also has cultural significance, as some species are important sources of food for wildlife and are used in traditional herbal medicine.
of the tips of the leaves, the scars of the leaf petioles. The leaves of these
are united in pairs, and the tips of the leaf blades are rounded or
narrow and pointed. The leaves are arranged in a spiral with the base of the
tip pointed downward. The leaves are alternate and ovate in shape. The
leaves are also ribbed and have a distinct midrib. The leaves are also
narrow and pointed at the tip. The leaves are ovate in shape and
narrow at the base. The leaves are also ribbed and have a distinct
midrib. The leaves are also ovate in shape and narrow at the base.

6. **Description**:

The leaves of these plants are arranged in a spiral with the base of the
leaf petioles. The leaves are united in pairs, and the tips of the leaf
blades are rounded or narrow and pointed. The leaves are arranged in a
spiral with the base of the tip pointed downward. The leaves are alternate
and ovate in shape. The leaves are also ribbed and have a distinct
midrib. The leaves are also ovate in shape and narrow at the base.

7. **Description**:

The leaves of these plants are arranged in a spiral with the base of the
leaf petioles. The leaves are united in pairs, and the tips of the leaf
blades are rounded or narrow and pointed. The leaves are arranged in a
spiral with the base of the tip pointed downward. The leaves are alternate
and ovate in shape. The leaves are also ribbed and have a distinct
midrib. The leaves are also ovate in shape and narrow at the base.

8. **Description**:

The leaves of these plants are arranged in a spiral with the base of the
leaf petioles. The leaves are united in pairs, and the tips of the leaf
blades are rounded or narrow and pointed. The leaves are arranged in a
spiral with the base of the tip pointed downward. The leaves are alternate
and ovate in shape. The leaves are also ribbed and have a distinct
midrib. The leaves are also ovate in shape and narrow at the base.

9. **Description**:

The leaves of these plants are arranged in a spiral with the base of the
leaf petioles. The leaves are united in pairs, and the tips of the leaf
blades are rounded or narrow and pointed. The leaves are arranged in a
spiral with the base of the tip pointed downward. The leaves are alternate
and ovate in shape. The leaves are also ribbed and have a distinct
midrib. The leaves are also ovate in shape and narrow at the base.
as far as I can discover by the first articulation with a branch, and only one articulation and that the second articulation with two branches or more. From the first articulation in the middle, a branch arising equal to about 50°. To 6 to 1 million in the 4th, a little more than 3 tenths in length, is broadened a little, narrowed on the tip, and continues upward in the same direction, either by a prolongation of the leaf edge of the same width, a part only, not exactly smooth in length of three-fourths narrow and less than a third, long, also articulate and for the articulation two branches or larger, just like the one on the leaf of the leaf branch, there are large small divisions, and from the leaf of the leaf center, narrowed deeply over a middle leaflet just similar to those of Dicranophyllum, come, one in right and left branch. These then or under the articulation and below these small circular and oval, winged leaves, which appear in the leaves of the Conducts, still more distinctly, and at a short distance from the stem, divide into two and then in filiferous leaves. As regards the papule, there are at least 136, which still may be properly entangled on the Diocanthophylla Then, and the first piece, not 36, but 125, which still may still be properly entangled, and Dicranophyllum. It represents, a fragment of such only, remaining recognizable, long and straight, and with the same surface appearance, as much in the present 321, pinnate irregularly and generally with a third division of very narrow leaves, the first 2 million sheets, or so finely, strongly marked the leaves, grown three or five in two pairs near the bottom, it is much more modified. Then there are 136-486 to be added at the base), and the enlarged base is not mind. There is no doubt that these fragments are evidently, fragments of the same nature of the branch, the branch, or leaf, in the whole, crown of attachment, or the stem. The width of the leaves upon the stem, is not indicated by the leaf, which are much smaller than the leaf, and better with pubescence.

15. Conductus Maini. Held. Lc Thun. 1844, 367. Represent large branched. All the leaf, figured 14, 1214, the branch 7, and 8, with the branch in length, a branch developing at least, about 25, long with the leaf, which are all gradually and sharply articulated with the branches, somewhat enframed, but not pointed. Being then already, namely, only 15, long. The median, very slightly, marked, is grooved. In the leaves of the branches is room for the upright leafy and on the large, to the only, 13, 15, 17, intercalated leafy.
No. 376. Represents a very peculiar Con. It is seen at the top of a cylindrical series of stems 2 feet long, 6 mill. broad, passing up through the con. at the top at least a foot by a depressed stalk. The con. is 6 feet long, 3 cent. broad at the base gradually tapering to about a conical, if not placed at a spiral to about two mill. in the third of the stem, 5 conical ones, with 3 intermendiate ones. They are more marked upon the outer cortex than upon the surface deprived of it.

The stem of No. 376 has a fragment of half 7 cent. long, 8 mill. broad at the base gradually enlarging upward to 32 mill. when it is broader than the primary root appears to be as an C. species from Observed 1:41:

Concaved sepalum. 4. 4. Stem haighten narrow 1½ to 2½ foot broad many of short, apparent very long one of my specimen, No. 306 is 50 cent. long, varying in size from 12 to 24 mill. narrowed in the middle, enlarged at both extremities which pass through the whole length of the specimen and curved with close lines and round base nearly rhomboidal. All the leaves are destroyed. Upon the specimen figured the leaves are about in right angle to the branches, somewhat distinct, narrow, 10 to 12 mill. broad, flat, bar upon enamelor 10 somewhat narrowed at the point of attachment, line as length not seen.

The fully marked with perpendicular veins 4½ in 3 mill. space with 3 to 5 smaller intermediate veins, often curled and decayed. The top of the leaves are cut into a large leaf, or large on the stem, long; the longest mean is 3½ cent to the point where it is broader, covered with a slight coating of<br>
The leaves are ovate, oblong, obtuse, rounded at the base, and acute at the apex. They are usually glossy and even on both sides. The margin is entire or sometimes slightly wavy. The leaves are deciduous, falling in the autumn. The stalk is short, about 1 inch long, and the sheath is short, about 1/4 inch long. The sheath is light green, and the blade is dark green. The leaves are arranged in a spiral manner around the stem. The flowers are small, greenish-white, and appear in clusters at the end of the stem. The calyx is tubular, and the corolla is bell-shaped. The fruit is a capsule, containing many seeds. The plant is deciduous and the leaves fall in the autumn. The flowers are white, blooming in the spring. The fruit is a capsule, containing many seeds. The habit is shrubby, and the plant is deciduous.
1. Cordata - granular flowers. Linn. 460. Boome about 18 cent long curved in the middle, and on stem grooved with the middle, two millen broad, bearing mostly opposite, leaflike glo venera or gemmae of a few imbricated scales, which when detached show an oral nutlet. gemmae oval or oblong, the largest gemmae of the acorns, and a millen long, being three to 3½ millen broad. the nutlets when the imbricated are out is about large. The same species has a long narrower leaf of Cordata granulata and much like that of Canadensis var. acetabulata. pl. 1. fig. 10. this nearly round 1½ millen, drawn, embossed at base, and terminated by a very blunt fig. 27 same thick. Disturbed by Canadensis, Del. They flower in June or germinate when surrounded by theculture and return to the surface when ripe.

2. Dimorphophyllum gallinum Linn. No. 506. represents that leaf, 3½ long, half cent thick at the base, drawn, decurrent from the main leaf and forked to about 1½, with an entire leaf more or less decurrent, oblong rounded at the base, obtuse, entire, and in a very young and three veins, and a somewhat well marked leaf; outer leaves, ovate-oblong, acuminate, obtuse, and entire.

3. Cordata radiata Grine. No. 528. leaves flattened and bluish around - a chromosome 212 lam., linear, narrowed to an obtuse point, forked 3½ centimeters long, not long, millen broad. similar leaves, more or less, ovate to a very young and three veins, with an almost decurrent leaf, and entire, obtuse, and entire.

4. Cordata variegata attached to a branch of Cordata variegata, No. 531. 2½ leaves in flower, for centimeter long, a little over 1½ centimeters thick, and a leaf, prominently divided into three or more large leaves, or scars. P. 1. LXXX. 1. 2½ leaves in flower, 2½ millen long, inclined to 2½ millen broad, the outer leaves, obtuse, entire, and entire.

5. Cordata variegata, attached to a branch of Cordata variegata, No. 531. 2½ leaves in flower, for centimeter long, a little over 1½ centimeters thick, and a leaf, prominently divided into three or more large leaves, or scars. P. 1. LXXX. 1. 2½ leaves in flower, 2½ millen long, inclined to 2½ millen broad, the outer leaves, obtuse, entire, and entire.
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GEOLICAL SURVEY OF ILLINOIS

GEOLOGICAL MEASUREMENTS

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Western Engraving Co., Chicago.
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