

LIST OF RECENTLY IDENTIFIED FOSSIL PLANTS BELONGING TO
THE UNITED STATES NATIONAL MUSEUM, WITH DESCRIPTIONS
OF SEVERAL NEW SPECIES.

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[Compiled and prepared for publication by F. H. Knowlton.]

(With four plates.)

NOTE OF EXPLANATION.

The following list comprises the identification of a large amount of material that has been accumulating in the Department of Fossil Plants since the founding of the Smithsonian Institution. This material, filling some fourteen boxes, was sent to Professor Lesquereux in September, 1885, and returned by him, named and labeled, in July, 1886. Much of the material was in a fragmentary condition, and was found to be incapable of satisfactory specific or even generic determination, and such has been discarded. As many of the specimens were without labels or other data by which they could be located, this will account for the frequently recurring statement that the locality and collector are unknown.

Several new species, of which descriptions and figures will be found in the text and plates, have been detected by Professor Lesquereux. These have generally been named for the discoverers.

The first number given the specimen is the regular catalogue number of the Museum collection of fossil plants. The lot number refers to the number given each lot of specimens before they were sent to Columbus. This was done to prevent confusion when there were numerous specimens representing different species from the same locality.

ALGÆ.

FUCACEÆ.

1. *Palæophycus irregularis* Hall.

Head of Red Water Valley, Black Hills, Dakota; H. Newton, collector, 1875; nineteen specimens; Museum number 2145; 9 specimens collector's number, 8684. Museum number, 2146 (1 specimen); collector's number, 8685. Museum number, 2147 (7 specimens); collector's number, 8685. Museum number 2148 (2 specimens); collector's number, 8689.

2. *Palæophycus tubularis* Hall.

Head of Red Water Valley, Black Hills, Dakota; H. Newton, collector, 1875; seven specimens; Museum number, 2149; collector's number, 8684.

3. *Palæophycus rugosus* Hall.

Blount County, Ala.; Frank Burns, collector, 1885; two specimens; Museum number, 2150; lot number, 224.

4. *Buthotrephis flexuosa* Hall.

Blount County, Ala.; Frank Burns, collector, 1885; seven specimens; Museum number, 2383; lot number, 224.

5. *Buthotrephis gracilis* Hall, var. *crassa* Hall.

Locality and collector unknown; Museum number, 2384.

EQUISETACEÆ.

EQUISETEÆ.

6. *Equisetites* spec., a stem.

Locality and collector unknown; one specimen; Museum number, 2389; lot number, 220.

CALAMARIEÆ.

7. *Calamites approximatus* Schloth.

Texas? Received through Mr. W. S. Yeates; one specimen; Museum number, 2152; lot number, 94.

8. *Calamites approximatus* Schloth, var. *cruciatus* Lx., n. v.

City of Mexico, Mexico. Received from Ellis Clark; one specimen; Museum number, 2151; lot number, 91.

9. *Calamites cannæformis* Schloth.

Blount County, Ala.; Frank Burns, collector; one specimen; Museum number, 2162; lot number, 89. Trinity River, Jackson County, Texas; A. R. Roessler, collector; two specimens; Museum number, 2156; lot number, 101.

10. *Calamites Cistii* Brongn.

Bay of Fundy. Through Dr. E. Foreman; one specimen; Museum number, 2157; lot number, 95. Pennsylvania Coal Fields. Received from the American Museum of Natural History, New York; one specimen; Museum number, 2161; lot number, 93.

11. *Calamites dubius* Artis.

Trinity River, Jackson County, Texas; A. R. Roessler, collector; two specimens; Museum number, 2155; lot number, 101.

12. *Calamites ramnifer* Stur.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; two specimens; Museum number, 2158; lot number, 223.

13. *Calamites ramosus* Artis.

Cannelton, Pa. Received from I. C. Russell; one specimen; Museum number, 2163; lot number, 227; one specimen; Museum number, 2159; lot number, 224. Centerville, Hickman County, Tenn. Ira Sayles, collector; one specimen. Museum number, 2160; lot number, 215.

14. *Calamites Suckowii* Brongn.

Commercial Summit, Whitney County, Ky.; M. P. Lightfoot, collector; two specimens; Museum number, 2153; lot number, 100. Two specimens; Museum number, 2154; lot number, 101.

15. *Asterophyllites equisetiformis* Brongn.

Mazon Creek, Illinois; A. H. Worthen, collector; one specimen; Museum number, 2220, on same stone as 2219; lot number, 69.

16. *Calamodendron approximatum* Brongn.

Coalburg, W. Va.; W. H. Edwards, collector; one specimen; Museum number, 2286; lot number, 216.

17. *Macrostachya* Schimp., sp., spike of.

Coalburg, W. Va.; W. H. Edwards, collector; one specimen; Museum number, 2393; lot number, 109.

18. *Bornia radiata* Schimp.

Enfaula, Indian Territory; H. F. Buckner, collector; one specimen; Museum number, 2164; lot number, 96. Warrior Creek, Jefferson County, Ala., Frank Burns, collector; two specimens; Museum numbers, 2165, 2166; lot number, 223. Locality, unknown; J. T. Abert, collector; one specimen; Museum number, 2167. Locality and collector, unknown; one specimen; Museum number, 2168; lot number, 226.

19. *Sphenophyllum erosum* L. & H.

Centerville, Tenn.; Ira Sayles, collector; two specimens; Museum number, 2225; lot number, 215.

20. *Annularia longifolia* Brongn.

Cannelton, Pa.; Received from I. C. Russell; one specimen; Museum number, 2172; lot number, 227.

21. *Annularia longifolia*, var. *angustifolia* Lx.

"Mire Road, C. B.," collector unknown; two specimens; Museum number, 2171; lot number, 102.

22. *Annularia sphenophylloides* (Zenk.) Gutb.

Centerville, Hickman County, Tenn.; Ira Sayles, collector; one specimen; Museum number, 2169; lot number, 215. Locality and collector, unknown; two specimens; Museum number, 2170; lot number, 99.

FILICES.

SPHENOPTERIDEÆ.

23. *Sphenopteris flaccida* Crépin.

Rawley Springs, Va.; Benj. Miller, collector; two specimens; Museum number, 2223; lot number, 57.

24. *Sphenopteris pseudo-murrayana* Lx.

Saint Clair, Pa.; received from George Powell; one specimen; Museum number, 2224; lot number, 75.

25. *Archæopteris minor* Lx.

Towanda, Pa.; George H. Eldridge, collector; one specimen; Museum number, 2385; lot number, 62.

NEUROPTERIDEÆ.

26. *Neuropteris biformis* Lx.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2180; lot number, 223.

27. *Neuropteris Carrii* Lx.

Wilkes-Barre, Pa.; received from American Museum of Natural History, New York; one specimen; Museum number, 2181; lot number, 66.

28. *Neuropteris cordata* Brongn.

Cannelton, Pa.; received from I. C. Russell; one specimen; Museum number, 2213, on same stone as number 2212; lot number, 227.

29. *Neuropteris decipiens* Lx.

Grundy County, Ills.; Fred. C. Green, collector; three specimens; Museum number, 2173; lot number, 222.

30. *Neuropteris Elrodi* Lx.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2175; lot number, 223. Warrior Creek, Jefferson County, Ala.; one specimen; Museum number, 2176; lot number, 223. Locality, unknown; I. T. Abert, collector; two specimens; Museum number, 2189; lot number, 226.

31. *Neuropteris hirsuta* Lx.

Saint Clair, Schuylkill County, Pa.; received from George Powell; three specimens; Museum number, 2185; lot number, 75. Eugene, Ind.; I. Collet, collector; four specimens; Museum number, 2188; lot number, 71.

32. *Neuropteris Loshii* Brongn.

Saint Clair, Schuylkill County, Pa.; received from George Powell; two specimens; Museum numbers, 2183, 2186; lot number, 75.

33. *Neuropteris obscura* Lx.

Saint Clair, Schuylkill County, Pa.; received from George Powell; two specimens; Museum number, 2182; lot number, 75.

34. *Neuropteris rarinervis* Bunbury.

Saint Clair, Schuylkill County, Pa.; received from George Powell; two specimens; Museum numbers, 2184, 2187; lot number, 75.

35. *Neuropteris retorquata* (?) Daws.

Crested Butte, Gunnison County, Colo. (?); George H. Eldridge, collector; twenty-two specimens.

They are all very small fragments either of ultimate pinnæ or mostly of pinnules. The large pinnules agree well with the description and figures of Dawson [Canadian Fossils p. 50, Pl. XVII, fig. 197]; but most

of the pinnules are smaller and narrower. As no fragment represents an entire pinna, the identification cannot be positive.

The nature of the anthracite shale in which these plants are preserved makes it seem improbable that they came from Colorado. The material resembles that from St. John, Canada; Museum number, 2197; lot number, 213.

36. *Neuropteris Smithii* Lx.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; two specimens; Museum numbers, 2174, 2178; lot number, 223.

37. *Callipteris pilosa* (?) Daws.

Crested Butte, Gunnison County, Colo. (?); George H. Eldridge, collector; one specimen.

From the description of the author [Foss. Pl. of the Devonian, p. 51, Pl. XVI, fig. 189] we learn that the frond is covered with numerous microscopic hairs, masking the nervation. The form and division of the pinnae and pinnules agree better with the figures than with the description of the plant by the author. The pinnules are enlarged and decurrent, connate at base, thin; nervation obsolete.

From the general character of the plant it appears rather referable to a *Pecopteris* than a *Callipteris*.

According to Dawson the plant is from the Middle Devonian of St. John.

Museum number, 2390; lot number, 213.

38. *Triphyllopteris Lescuriana* Meek.

Whetstone Hill, Va.; H. R. Geiger, collector; six specimens; Museum number, 2190; lot number, 218.

PECOPTERIDEÆ.

39. *Pecopteris arborescens* Brongn.

Locality and collector unknown; two specimens; Museum numbers, 2194, 2201.

40. *Pecopteris dentata* Brongn.

Saint Clair, Schuylkill County, Pa.; received from George Powell; one specimen; Museum number, 2197; lot number, 75. Deavertown, Ohio; received from S. C. Gray; two specimens; Museum number, 2200; lot number, 73.

41. *Pecopteris Fontainii* Lx. *P. abbreviata*, Brgt., olim. 1st Penn. Geol. Rept., p. 867, etc.

Locality and collector unknown; one specimen; Museum number, 2198; lot number, 70.

42. *Pecopteris serrulata* Hart.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2191; lot number, 223.

43. *Pecopteris unita* Brongn.

Locality and collector unknown; one specimen; Museum number, 2199; lot number, 70.

44. *Pecopteris villosa* Brongn.

Mazon Creek, Ill.; received from the American Museum of Natural History, New York; one specimen; Museum number, 2195; lot number, 68. Cannelton, Pa.; received from I. C. Russell; one specimen; Museum number, 2203; lot number, 227. Cannelton, Pa.; received from I. C. Russell; one specimen; Museum number, 2211, on same stone as number 2210; lot number, 227. Museum number, 2214, on same stone as number 2212; lot number, 227.

45. *Pecopteris villosa* Brongn., var. *microphylla* Lx.

Green County, Pa.; Benj. Miller, collector; four specimens; Museum number, 2196; lot number, 74. Two specimens; Museum number, 2193; lot number, 53.

Differs by the smooth rachis, the pinnules very small narrow linear-oblong obtuse, free to the base or connate only at the very base, at right angles to the narrow rachis. The pinnæ are linear-lanceolate, also at right angles, curved upwards near their extremities; the pinnules at base are not more than 1^{mm} broad and 3-4^{mm} long, deeply villose on the surface.

46. *Pecopteris Powellii*, sp. nov. Pl. I, fig. 1, 1 a.

City of Mexico; Ellis Clark, collector.

A small bipinnate fragment: Rachis narrow; ultimate pinnæ opposite, open and slightly recurved; pinnules small, alternate, close, sub-linear, obtuse, connate to above the base, separated by narrow obtuse sinuses; medial nerve thin, percurrent, the lateral oblique, curved toward the borders from the middle, there forking in two or three branches.

By the form and position of the pinnules, this fern is evidently referable to *Pecopteris*. But its basilar nerves are emerging from the rachis and enter the base of the pinnules vertically or obliquely as in species of *Alethopteris*.

One specimen; Museum number, 2202; lot number, 56.

47. *Pecopteris* spec., fruit of.

Richmond, Va.; received from Nat. West; one specimen; Museum number, 2192; lot number, 54. "Pettyshton's R. I. Cala"; G. Thomson, collector.

48. *Pseudopecopteris anceps* Lx.

Cannelton, Pa.; received from I. C. Russell; one specimen; Museum number, 2212; lot number, 227.

49. *Pseudopecopteris dimorpha* Lx.

Rhode Island; received from the American Museum of Natural History, New York; one specimen; Museum number, 2209; lot number, 65.

50. *Pseudopecopteris muricata* (Brgt.) Lx.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; three specimens; Museum numbers, 2204, 2206, 2208; lot number, 223. Centerville, Tenn.; Ira Sayles, collector; four specimens; Museum numbers, 2207, 2218; lot number, 215.

51. *Pseudopecopteris Pluckenetii* (Brgt.) Lx.

Cannelton, Pa.; received from I. C. Russell; one specimen; Museum number, 2210; lot number, 227.

52. *Alethopteris ambigua* Lx.

Mazon Creek, Ill.; A. H. Worthen, collector; one specimen; Museum number, 2219; lot number, 69.

53. *Alethopteris lonchitica* Sternb. sp.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; three specimens; Museum number, 2215; lot number, 223. Centerville, Tenn.; Ira Sayles, collector; six specimens; Museum number, 2216; lot number, 215. Cannelton, Pa.; Received from I. C. Russell, one specimen; Museum number, 2222; lot number, 227.

54. *Alethopteris lonchitica*, var. *angustifolia* Lx., n. v.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2217; lot number, 223.

55. *Alethopteris Serlii* Brongn.

Eugene, Ind.; I Collett, collector; two specimens; Museum number, 2221; lot number, 71.

56. *Woodwardia latiloba* Lx.

Separation, Colo.; Mr. Levy, collector; one specimen; Museum number, 2394; lot number, 23.

LYCOPODIACEÆ.

57. *Lycopodites tenerrimus*? Heer.

Upper Kanab Valley, Utah; C. D. Walcott, collector; two specimens.

The fragments are much like those figured and described by Heer, Fl. Foss. Arct. IV., pt. 2 [Jura Fl. Ostsibir] p. 42, Pl. XV., figs. 1*d*, 2-8. Stem thin, filiform, fasciculate at base; dichotomous; branches erect, filiform, bearing very small linear, short, or lanceolate longer, leaves without nerves. Except that Heer says of the leaves that they are very approximate, his description agrees with the plant. But from his figures the leaves are as distant upon some stems and as large as upon the specimens of the Museum.

This plant is also much like *Widdringtonites Reichii* Heer, but the leaves are larger and the base of the stem is without leaves and more slender. Museum number, 2287; lot number, 8.

LEPIDODENDREÆ.

58. *Lepidodendron aculeatum* Sternb.

Warrior Creek, Jefferson county, Ala.; Frank Burns, collector; three specimens; Museum number, 2231; lot number, 223.

59. *Lepidodendron acuminatum* (Göpp.) Ung.

Locality unknown; received from Professor Taylor, one specimen; Museum number, 2243; lot number, 85.

60. *Lepidodendron clypeatum* Lx.

Liberty Spring, Ark.; Dr. G. H. Horn, collector; one specimen; Museum number, 2226; lot number, 110. Henry County, Mo.; Dr. J. H. Britts, collector; one specimen; Museum number, 2230; lot number, 104. Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; four specimens; Museum number, 2232; lot number, 223. Locality unknown; received from I. T. Abert; two specimens; Museum number, 2248; lot number, 226.

61. *Lepidodendron corrugatum* Daws.

Florida; James Neal, collector; one specimen; Museum number, 2244; lot number, 215. Locality and collector unknown; three specimens; Museum number, 2247; lot number, 99?

62. *Lepidodendron corrugatum* Daws., var.

Lewis Tunnel, W. Va.; F. W. Meek?; two specimens; Museum number, 2237; lot number, 84.

63. *Lepidodendron dichotomum* Sternb.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2233; lot number, 223. Coalburg, W. Va.; received from W. H. Edwards; one specimen; Museum number, 2236; lot number, 109. Harrisonville, Pa.; received from Robert McElwain; one specimen; Museum number, 2245; lot number, 108.

64. *Lepidodendron dichotomum* Sternb., var. *obovatum* Schimper.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2227; lot number, 223.

65. *Lepidodendron Gaspianum* Daws.

Lewis Tunnel, W. Va.; F. W. Meek?; one specimen; Museum number, 2238; lot number, 84. Lewis Tunnel, W. Va.; received from F. W. Meek?; one specimen; Museum number, 2239; lot number, 84.

66. *Lepidodendron modulatum* Lx.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2234; lot number, 223. Liberty Springs, Ark.; Dr. G. H. Horn, collector; one specimen; Museum number, 2242; lot number, 110. Harrisonville, Pa.; received from Robert McElwain; two specimens; Museum number, 2246; lot number, 108.

67. *Lepidodendron Rushvillense* Andrews.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; two specimens; Museum number, 2240; lot number, 223.

68. *Lepidodendron Veltheimianum* Sternb.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; five specimens; Museum numbers, 2228, 2235; lot number, 223. Locality and collector unknown; one specimen; Museum number, 2229. Liberty Springs, Ark.; Dr. G. H. Horn, collector; one specimen; Museum number, 2241; lot number, 110.

69. *Lepidodendron*, leaves of.

Alabama; unknown; two specimens; Museum number, 2249; lot number, 223.

70. *Cyclostigma densifolium*? Daws.

Lewis Tunnel, W. Va.; "Meek's Types?"; one specimen; Museum number, 2283; lot number, 97.

71. *Bothrodendron punctatum* L. & H.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2282; lot number, 223.

72. *Knorria* species.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2280; lot number, 233.

73. *Lepidostrobus variabilis* L. & H.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2284; lot number, 223.

74. *Lepidocystis fraxiniformis* Lx.

Henry County, Mo.; received from W. S. Yates?; one specimen; Museum number, 2285; lot number, 90.

75. *Lepidophyllum majus*? Brongn.

Crested Butte, Gunnison County, Colo.; Geo. H. Eldridge, collector; one specimen; Museum number, 2386; lot number, 213.

TÆNIOPHYLLEÆ.

76. *Tæniophyllum*? n. sp.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector.

Upon a large specimen partly covered with pinnae, of *Pseudopecopteris muricata* Bt. [a peculiar variety with rachis smooth and pinnules close, decurrent and connate at base] there are two long stems flattened, smooth, minutely striate lengthwise, $1\frac{1}{2}$ to 2 centimeters broad, appearing like rachis of the fern. From these stems there come out all along them parallel leaves similar to leaves of *Lepidodendron* 5 centimeters broad, smooth, triple nerved in the middle, linear, curved upward, apparently long. They are mostly broken at a short distance from the rachis or stem to which they are attached at right angles, but a few are

preserved as long as 12 centimeters. The attachment of these leaves to the rachises, which are more than 20 centimeters long, may be merely apparent and these stems or rachises may cover the leaves derived from some *Lepidodendron*, but at some places along the rachis the leaves are slightly decurring to it, flattened and really attached to it. These leaves and their mode of attachment have some relation to those of *Lepidoxylon* and still more to those of *Desmiophyllum gracile* C. Fl. Pl. 82 f. 1. But they are evidently triple nerved in the middle and thus analogous to leaves of *Lepidodendron*. The rachis of *Pseudoplecteris muricata* is very broad dichotomous (alternately so) transversely rugose in the middle.

One specimen; Museum number, 2205, on same stone as No. 2204; lot number, 223.

SIGILLARIEÆ.

77. *Sigillaria Defrancii* Brongn.

Henry County, Mo.; received from W. S. Yeates?; one specimen; Museum number, 2267; lot number, 90.

78. *Sigillaria elliptica*, var. ———, Brongn.

Belgium; received from Professor Hainarts; one specimen; Museum number, 2266; lot number, 86.

79. *Sigillaria ichthyolepis* Sternb.

Locality and collector unknown; three specimens; Museum number, 2268; lot number, 111.

80. *Sigillaria monostygma* Lx.

Cannelton, Pa.; received from J. T. Abert; one specimen; Museum number, 2269; lot number, 227.

81. *Sigillaria reniformis* Brongn.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2264; lot number, 223.

82. *Sigillaria Voltzii* Brongn.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; two specimens; Museum number, 2263; lot number, 223.

83. *Sigillaria*, n. sp. ? too small for determination.

Centerville, Tenn.; Ira Sayles, collector; one specimen; Museum number, 2265; lot number, 215.

84. *Sigillaria*, spec., with *Sigillaria stellata*, Lx.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; two specimens, fragments of a trunk, decorticated; Museum number, 2262; lot number, 223.

85. *Stigmara ficoides* Brongn.

Two miles west of Wales, Utah; Dr. C. A. White, collector; one specimen; Museum number, 2250; lot number, 229. Blount County,

Ala.; Frank Burns, collector; two specimens; Museum number, 2254; lot number, 224. Harrisonville, Pa.; received from Robt. McElwain; three specimens; Museum number, 2256; lot number, 80. Baugh Bend, Walker County, Ala.; U. McKinley, collector; one specimen; Museum number, 2260; lot number, 77.

86. *Stigmaria ficoides* Brongn., var. *elliptica* Goepf.

Locality and collector unknown; one specimen; Museum number, 2259; lot number, 82.

87. *Stigmaria ficoides* Brongn., var. *minor* Gein.

Locality and collector unknown; six specimens; Museum number, 2257; lot number, 82. Blount County, Ala.; Frank Burns, collector; one specimen; Museum number, 2252; lot number, 224.

88. *Stigmaria ficoides* Brongn., var. *undulata* Goepf.

Blount County, Ala.; Frank Burns, collector; one specimen; Museum number, 2251; lot number, 224. Locality and collector unknown; two specimens; Museum number, 2258; lot number, 82.

89. *Stigmaria*, leaves of.

Centerville, Tenn.; Ira Sayles, collector; one specimen; Museum number, 2255; lot number, 215. Locality unknown; A. Hague, collector; two specimens; Museum number, 2261; lot number, 41.

90. *Stigmaria*, spec.

Lewis Tunnel, W. Va.; Meek, collector; two specimens; Museum number, 2253; lot number, 103.

CYCADACEÆ.

CORDAITEÆ.

91. *Cordaites angustifolius* Daws.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2274; lot number, 223. Crested Butte, Gunnison County, Colo.; Geo. H. Eldridge, collector; two specimens; Museum number, 2276; lot number, 213.

92. *Cordaites borassifolius* Ung.

Cannelton, Pa.; received from I. C. Russell; one specimen; Museum number, 2279; lot number, 227.

93. *Cordaites costatus* Lx.

Cannelton, Pa.; received from I. C. Russell; two specimens; Museum number, 2278; lot number, 227.

94. *Cordaites mansfieldi* Lx.

Cannelton, Pa.; received from I. C. Russell; two specimens; Museum number, 2277; lot number, 227.

95. *Cordaites*, spec.

City of Mexico, Mexico; received from Ellis Clark; one specimen; Museum number, 2270; lot number, 56.

Centerville, Tenn.; Ira Sayles, collector; one specimen; Museum number, 2272; lot number, 215.

96. *Cordaites*, n. sp.?

Russia; collector and exact locality unknown.

Leaves large, cuneiform, flabellate in outline, apparently thick, equally thickly nerved, nerves simple, at equal distance, very obtuse or flattened at the top.

There are two leaves, close to each other, 1 centimeter broad at the base where they are broken, 14 centimeters long and 10 centimeters broad at the apex, which is also destroyed. The nerves at or near the base are thick nearly 1 millimeter and a little more than 1 millimeter distant in the middle of the leaves, while above they are only $\frac{1}{2}$ millimeter distant, all very distinct and without intermediate veinlets. The form of these leaves is much like that of *Cordaites grandifolius*, Lx., C. Fl. Pl. 77, fig. 1, 2, but the substance is thicker, apparently coriaceous and the nervation is different.

One specimen; Museum number, 2275; lot number, 98.

97. *Cordaites*, stem of.

Henry County, Mo.; Dr. J. H. Britts, collector; one specimen; Museum number, 2273; lot number, 88.

98. *Cordaites*, leaves of.

Centerville, Tenn.; Ira Sayles, collector; one specimen; Museum number, 2271; lot number, 215.

99. *Cordaianthus*, spec.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2391; lot number, 223.

NÆGGERATHIÆ.

100. *Næggerathia*, spec.

Oxford, England; received from the University of Oxford, through Prof. H. N. Mosley; one specimen; Museum number, 2281; lot number, 26.

CYCADEÆ.

101. *Fittonia*, spec. ? Plate I, fig. 1.

Fragment of a trunk of the Cycadeæ, with prominent half-round bolsters like those of *Fittonia*, Carruth. Apparently new species.

Clear Lake, Cal.; G. F. Becker, collector; one specimen, Museum number, 2395; lot number, 10.

102. *Cycadeospermum æquilaterale*, n. sp.

Oxford, England; received from the University of Oxford, England, through Prof. H. N. Mosley.

Fruit oblong-linear, obtuse or obtusely rounded at the base, obliquely pointed, flat, convex, and obscurely striate; 10-22 millimeters long, 5-8 millimeters broad.

Six specimens; Museum number, 2316; lot number, 26.

103. *Cycadeospermum faboideum*, sp. nov.

Oxford, England; received from the University of Oxford, England, through Prof. H. N. Mosley.

Fruit oval, rounded at the apex, unequilateral at base, with a semi-lunar scar marking the point of attachment; obscurely striate; 26 millimeters long, 20 millimeters broad.

One specimen; Museum number, 2318½; lot number, 26.

104. *Cycadeospermum impressum* Nath.

Oxford, England; received from the University of Oxford, through Prof. H. N. Mosley; three specimens; Museum number, 2318; lot number, 26.

105. *Cycadeospermum subfalcatum*, n. sp.?

Oxford, England; received from the University of Oxford, through Prof. H. N. Mosley.

Fruit oblong, pointed at both ends, thick, not compressed, subfalcate, obtuse, or truncate at the apex, truncate at the base or short pedicelled [the pedicel immersed or indistinct]; 13 centimeters long, 5 centimeters broad and as thick, nearly semilunar in form.

One specimen; Museum number, 2319; lot number, 26.

106. *Cycadeospermum Wimillense*? Sap.

Oxford, England; received from the University of Oxford, through Prof. H. N. Mosley; four specimens; Museum number, 2317; lot number, 26.

107. *Cycadeospadix*, spec.

Oxford, England; received from the University of Oxford, through Prof. H. N. Mosley; one specimen; Museum number, 2311; lot number, 26.

108. *Rhabdocarpus multistriatus* (Presl.) Lx.

Centreville, Tenn.; Ira Sayles, collector; four specimens; Museum number, 2288; lot number, 215.

109. *Cardiocarpus conglobatus* Lx.

Eufaula, I. T.; H. F. Buckner, collector; one specimen; Museum number, 2388; lot number, 96.

110. *Cardiocarpus annularis* St.

Fuveau, Bouches-du-Rhone, France; received from J. B. Marcou; one specimen; Museum number, 2387; lot number, 37.

111. *Taxospermum Gruneri* Br.

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2407; lot number, 26.

112. *Trigonocarpus perantiquus* Daws.

Crested Butte, Gunnison County, Colo.; Geo. H. Eldridge, collector; three specimens; Museum number, 2392; lot number, 213.

CONIFERÆ.

ABIETINÆ.

113. *Pinus*, scale of.

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2289; lot number, 8.

114. *Abietites dubius* Lx.

Upper Kanab Valley, Utah; C. D. Walcott, collector; four specimens; Museum number, 2290; lot number, 8.

CUPRESSINÆ.

115. *Palæocyparis elegans*? Sap.

Oxford, England; received from the University of Oxford, through Prof. H. N. Mosley; one specimen; Museum number, 2406; lot number, 26.

TAXODIÆ.

116. *Sequoia Langsdorffii* Heer.

Kudlesæet, North Greenland; A. A. Ackerman, collector; four specimens; Museum number, 2291; lot number, 44.

117. *Sequoia Reichenbachi* Heer.

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2292; lot number, 8.

118. *Taxodium distichum* Rich., var. *miocenium* Heer.

Mackenzie River, mouth of Bear River; B. R. Renss, collector; five specimens; Museum number, 2297; lot number, 25. Selvinia Cañon, Utah; G. K. Gilbert, collector; three specimens; Museum number, 2298; lot number, 17.

119. *Taxodium dubium* Sternb.

Deer Creek Coal-field, Ariz.; C. D. Walcott, collector; one specimen; Museum number, 2296; lot number, 214.

120. *Glyptostrobus Ungerii* Heer.

Locality and collector unknown; two specimens; Museum number, 2299; lot number, 13.

121. *Glyptostrobus*, spec.

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2293; lot number, 8.

122. *Echinostrobus Sternbergii* Sch.

Oxford, England; received from the University of Oxford through Prof. H. N. Mosley; three specimens; Museum number, 2294; lot number, 26.

123. *Brachyphyllum crassum*? Lx., ined.

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2295; lot number, 8.

TAXEÆ.

124. *Ginkgo adiantoides* Ung., sp.

Sitka, Alaska; E. W. Nelson, collector; one specimen; Museum number, 2300; lot number, 210.

125. *Frenelopsis Hoheneggeri*? (Ett.) Schenk.

Southwest of Strahlenberg Mountain, Nev.; C. D. Walcott, collector.

The stems are not articulate nor sheathed. It is a stem apparently granulose or punctate and obscurely lineate, but as the stone is very coarse it is not possible to see if the granulations are not caused by impression from the stone.

Museum number, 2301; lot number, 196.

CONIFEROUS?

126. *Whittleseya elegans* Ny.

Warrior Creek, Jefferson County, Ala.; Frank Burns, collector; one specimen; Museum number, 2177, on same stone as number 2176; lot number, 223.

GRAMINEÆ.

ARUNDINEÆ.

127. *Arundo Gœpperti* Heer.

Silver Cliff, Colo.; received from C. W. Cross; one specimen; Museum number, 2303; lot number, 199.

128. *Arundo Gœpperti*? Heer.

Southwest of Strahlenberg, Utah; C. D. Walcott, collector; one specimen; Museum number, 2302; lot number, 796.

129. *Arundo*, spec.

Yankton, Dak.; P. Soper, donor; one specimen; Museum number, 2304; lot number, 51.

130. *Phragmites Alaskana*? Heer.

Fort Concho; W. M. Norton, collector; one specimen; Museum number, 2307; lot number, 72.

131. *Phragmites cretaceus*? Lx.

Deer Creek coal-field, Utah; C. D. Walcott, collector.

Appears to be this species differing by the intermediate veinlets being less numerous than in the Miocene species.

Four specimens; Museum number, 2305; lot number, 214. Upper Kanab Valley, Utah; C. D. Walcott, collector; two specimens; Museum number, 2306; lot number, 8.

FESTUCEÆ.

132. *Poacites Mengeanus*? Heer.

Clear Lake, Cal.; G. F. Becker, collector; two specimens; Museum number, 2308; lot number, 10.

CYPERACEÆ.

CARICEÆ.

133. *Carex*, leaves of.

Sitka, Alaska; E. W. Nelson, collector; one specimen; Museum number, 2309; lot number, 210.

134. *Cyperites borealis*? Heer.

Applegarth Cañon; A. Hague, collector; one specimen; Museum number, 2312; lot number, 112.

135. *Cyperites canaliculatus* Heer.

Southwest of Strahlenberg, Utah; C. D. Walcott, collector; one specimen; Museum number, 2313; lot number, 196.

136. *Cyperites*, spec.?

Bridgeton, N. J.; J. B. Marcou, collector; one specimen; Museum number, 2314; lot number, 207.

IRIDACEÆ.

IRIDEÆ.

137. *Irites Alaskana*, n. sp.

Cape Lisbourn, Alaska, Henry D. Woolfe, collector.

Leaves thickish, linear-lanceolate, tubulose at apex, narrowed to the base, falcate, æqui-nerved, medial nerve obsolete, lateral, broad, equal.

The leaves are comparatively narrow; the best preserved, apparently nearly entire, is 13 centimeters long, 1½ centimeters broad in the middle; nerves, about 1 millimeter in width, not very prominent, equal, not separated by intermediate veinlets, very distinct; surface smooth, covered by a thin pellicle of coaly matter, some fragments showing the tubulose point and base. The median nerve is slightly marked in places.

Comparing these leaves with those of cultivated species of *Iris*, the essential characters, nervation, thickness of leaves, &c., are the same.

Four specimens; Museum number, 2320; lot number, 204.

NAIADACEÆ.

138. *Caulinites Beckeri*, n. sp.* Pl. I, fig. 3; Pl. II, fig. 2-4.

Clear Lake, Cal.; G. F. Becker, collector.

Rhizoma horizontal, cylindrical or flattened, marked all around or articulate by the scars of leaves (?) in parallel short close rows, emit-

*APRIL 2, 1887.—Since the above was in type, the following letter has been received from Mr. G. F. Becker, the collector of the specimens, which seems to show that it is the modern Tule, *Scirpus lacustris* L. [*Scirpus validus* Vahl.], in a state of calcification or incrustation:

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
Washington, D. C., February 23, 1887.

Prof. LESTER F. WARD:

SIR: The roots sent you from Sulphur Bank, Clear Lake, California, occur in modern lake beds close to an outflow of basalt and to the edge of the present lake.

ting numerous erect cylindrical smooth stems, surrounded at base by rows of scars of leaves or close articulations, being marked, like the rhizomas, by deep, round points, scars of rootlets.

The rhizomas, varying in diameter from 1 to $2\frac{1}{2}$ centimeters, are irregular, cylindrical or flattened, strangled and contorted in divers ways, much branching, or sending upwards at irregular distance cylindrical stems 6 to 10 millimeters diameter, surrounded at their base by concentric layers, like the remaining base of rows of leaves. The stems are quite smooth, though obscurely striate lengthwise, resembling those of some large species of *Juncus*, like *J. militaris* or those of the leaves and flowers of *Nelumbium luteum*.

The species is distantly related to *Caulinites Parisiensis*, Brgt., as figured in Schimper's Atlas Pal. Veget., Pl. LXXXI, fig. 1 and 2, at least for the articulation left by the base of the leaves. But the rhizomas are, at least sometimes, twice as large; the stems are short, with only four or five rows of very narrow, $\frac{1}{2}$ to 1 millimeter broad, basilar scars of leaves, and the rhizomas creeping, with all the stems turned up or toward the same side.

Though there are among the specimens large blocks of hardened clay filled with rhizomas and stems of the species, I have not been able to see in them any traces of leaves. But decorticated fragments show, on the under side of the bark, two kinds of radicles, some most abundant, often in regular rows, being tubulose inflated, at least $\frac{1}{2}$ millimeter in diameter, others intermixed, very thin filiform.

These remains are in a kind of tufaceous clay from the shores of Clear Lake, California. The species is named for the collector, Mr. G. F. Becker. Museum number, 2320; lot number, 10. Fifty specimens.

TYPHACEÆ.

139. *Sagittaria*, n. sp. ?

Sitka, Alaska; E. W. Nelson, collector; one specimen; Museum number, 2310; lot number, 210.

Through the basalt and within a few yards of the silicified roots, active, solfataric, thermal springs still exist. All along the edge of the lake tules grow in great abundance. I compared the fossils with the roots of the living tules and could see no difference whatever. I am no botanist, however. As a geologist I do not hesitate to affirm that the roots are recent, and I do not believe that they are one thousand years old. I have instructed Mr. H. W. Turner to forward to you roots of the living tules by mail or express. If we have no specimens in San Francisco, T. will procure them from the lake.

Very respectfully,

G. F. BECKER,
Geologist in charge.

Professor Lesquereux says of this additional information [in litt. April 1, 1887]: "The subject is interesting, as the study of the plant in the different states of preservation or fossilization of its organs could show the work of nature and the modifications of forms by fossilization and prove also the long continuance of a type formerly recognized in geological time." It has been thought best to let the name stand the present as it is.—Editor.

PALMEÆ.

CORYPHEÆ.

140. *Sabalites*, spec.

Salvinia Cañon, Utah; G. K. Gilbert, collector; two specimens; Museum number, 2315; lot number, 17.

MYRICACEÆ.

141. *Myrica callicomæ folia* Lx.

Locality and collector unknown. Two specimens; Museum number, 2362; lot number, 13.

142. *Myrica Studeri*? Heer.

White River, Dakota, Maj. J. W. Powell, collector; two specimens; Museum number, 2361; lot number, 27.

CUPULIFERÆ.

BETULEÆ.

143. *Alnus Kefersteinii*, var. Heer.

Kudlisart, North Greenland; A. A. Ackerman, collector; one specimen; Museum number, 2369 (on same stone as number 2366); lot number, 44.

CORYLEÆ.

144. *Ostrya! Walkeri*? Heer.

Withville, Va.; Howard Schriever, collector; one specimen; Museum number, 2322; lot number, 24.

145. *Carpinus grandis* Ung.

Locality and collector unknown; one specimen; Museum number, 2323; lot number, 18.

146. *Corylus McQuarrii* Forbes.

Unga Island, Alaska; Mr. W. H. Dall, collector; five specimens; Museum number, 2324; lot number, 29. Kudlisart, North Greenland; A. A. Ackerman, collector; one specimen; Museum number, 2325; lot number, 44.

QUERCINEÆ.

147. *Fagus Deucalionis* Ung.

Kudlisart, North Greenland; A. A. Ackerman, collector; one specimen; Museum number, 2326; lot number, 44.

148. *Castanea Ungerii* Heer.

Kudlisart, North Greenland; A. A. Ackerman, collector; one specimen; Museum number, 2327; lot number, 44.

149. *Quercus chrysolepis* Leib., forma montana.

Placer County, Cal.; Wm. P. Blake, collector; one specimen; Museum number, 2334; lot number, 33.

150. *Quercus Crossii*, n. sp. Pl. II, Figs. 5, 6.

Ryolite Bed, Silver Cliff, Colo.; C. W. Cross, collector.

Leaves small, coriaceous, convex on the upper face, oblong or oblanceolate, cuneate at the base, abruptly round-pointed at the apex, dentate, except toward the base; mid-rib thick, straight; secondaries oblique, slightly curved in passing to the borders, nearly simple; craspedrome.

Two small leaves, $3\frac{1}{2}$ to 4 centimeters long, $1\frac{1}{2}$ centimeters broad in the upper part or above the middle, with 5-6 pairs of alternate or opposite secondaries diverging 30° - 35° , curved in passing toward the borders, thick and simple, except near the border, with somewhat obsolete nerviles at right angles. The leaves have a degree of affinity to those of *Quercus Mediterranea* Ung., differing especially by the short, less-acutely pointed teeth, very short toward the base, gradually larger to the apex, similar, however, to the figure of this species in Heer. Fl. Tert. Helv., Plate LXXVI, f. 15.

With living species, the relation of the leaves is closely marked with those of *Quercus suber* and *Q. ilex*, differing by the great thickness of the nerves, especially the medial. They appear to have been short petioled. Species named for the collector, Mr. C. W. Cross.

Two specimens; Museum number, 2329; lot number, 209.

151. *Quercus Drymeja* Ung.

Separation, Colo., 1881; Lester F. Ward, collector; one specimen; Museum number, 2333; lot number, 22.

152. *Quercus Gaudini* Lx. Pl. II. Figs. 7, 8.

Locality and collector unknown; one specimen; Museum number, 2330; lot number, 13. Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2332; lot number, 8.

153. *Quercus imbricaria* Mich. fossilis.

Bridgeton, N. J.; J. B. Marcou, collector; two specimens, Museum number, 2328; lot number, 207.

154. *Quercus neriifolia* Al. Br.

Locality and collector unknown; one specimen; Museum number, 2335; lot number, 13.

155. *Quercus Platania*? Heer?

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2331; lot number, 8.

SALICINEÆ.**156. *Salix proteæfolia*? Lx.**

Near Las Animas, Colo.; Dr. C. A. White, collector; three specimens; Museum number, 2336; lot number, 4.

157. *Populus arctica* Heer.

Cascades, Oregon; A. Hague, collector; one specimen; Museum number, 2338; lot number, 20.

158. *Populus denticulata* Heer.

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2337; lot number, 8.

JUGLANDACEÆ.

159. *Juglans acuminata* Al. Br.

Amethyst Mountain, Yellowstone National Park; W. H. Holmes, collector; two specimens; Museum number, 2378; lot number, 21.

160. *Pterocarya Americana* Lx.

Locality and collector unknown; one specimen; Museum number, 2377; lot number, 28.

PLATANACEÆ.

161. *Platanus Guffelmæ* Goepf.

Kudlisart, North Greenland; A. A. Ackerman, collector; one specimen; Museum number, 2366; lot number, 44. Separation, Colo.; Mr. Levey, collector; one specimen; Museum number, 2340; lot number, 23.

162. *Platanus*, spec.

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2339; lot number, 8.

URTICACEÆ.

163. *Ficus atavina* Heer.

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen.

According to the author is the same as *F. protozea* Heer. Fl. Arct. iii, p. 109, Pl. xxx, f. 1-8. The leaf which I refer to it has the lateral nerves obscure, but visibly very close, at an acute angle of divergence. The leaf is large, equally and gradually narrowed to the base and to the apex, which seems to be acuminate.

Museum number, 2402; lot number, 8.

Las Animas, Colo.; Dr. C. A. White, collector; two specimens; Museum number, 2403; lot number, 4.

164. *Ficus tiliæfolia* Al. Br.

Silver Cliff, Colo.; C. W. Cross, collector; three specimens; Museum number, 2341; lot number, 199.

PROTEACEÆ.

EMBOTHRIEÆ.

165. *Lomatia Saportanea?* Lx.

Las Animas, Colo.; Dr. C. A. White, collector; one specimen; Museum number, 2342; lot number, 4.

166. *Lomatia*, spec. ?

Locality and collector unknown; one specimen; Museum number, 2343; lot number, 13.

BANKSIEÆ.

167. *Dryandroides lignitum* (Ung.) Ett.

Deer Creek coal-fields, Ariz.; C. D. Walcott, collector; five specimens; Museum number, 2344; lot number, 214.

LAURACEÆ.

TETRANTHEREÆ.

168. *Laurus socialis* Lx.

Locality and collector unknown; two specimens; Museum number, 2347; lot number, 28.

169. *Laurus*, spec.

Deer Creek coal-fields, Ariz.; C. D. Walcott, collector; one specimen; Museum number, 2345; lot number, 214. Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2346; lot number, 8.

CINNAMOMEÆ.

170. *Cinnamomum lanceolatum* Heer.

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2349; lot number, 8.

171. *Cinnamomum Scheuchzeri* Heer.

Upper Kanab Valley, Utah; C. D. Walcott, collector; two specimens; Museum number, 2348; lot number, 8.

ASCLEPIADEÆ.

172. *Echitonium Sophiæ* O. Web.

White River, Dak.; Maj. J. W. Powell, collector; one specimen; Museum number, 2398; lot number, 27.

EBENACEÆ.

173. *Diospyros anceps* Heer.

White River, Dak.; Maj. J. W. Powell, collector; one specimen; Museum number, 2350; lot number, 27.

174. *Diospyros brachysephala*? Al. Br.

Deer Creek coal-fields, Ariz.; C. D. Walcott, collector; one specimen; Museum number, 2351; lot number, 214.

ERICACEÆ.

ANDROMEDEÆ.

175. *Andromeda affinis* Lx.

Las Animas, Colo.; Dr. C. A. White, collector; one specimen; Museum number, 2355; lot number, 4.

176. *Andromeda linearifolia*, n. sp. Pl. III, Figs. 2 and 3.

Ryolite Beds, Silver Cliff, Colo.; C. W. Cross, collector.

Leaves small, narrow, linear, coriaceous and revolute on the borders, narrowed at base; medial nerve very thick and broad; secondaries very oblique, parallel five to six pairs in a fragment of a leaf 2^{cm} long, 4^{mm} broad. The angle of divergence of the nerves is only 10 to 15°. The species is comparable to *A. revoluta* Heer. Fl. Tert. Helv., Pl. (ci, t. 24, especially 24b,) the leaves being however narrower and much smaller, one of them preserved nearly entire being only 6^{mm} long, 2^{mm} broad. It still differs by the secondaries at a more acute angle of divergence, strong, and the surface obscurely reticulate.

Three specimens; Museum number, 2352; lot number, 209.

177. *Andromeda Parlatorii*, Heer.

Las Animas, Colo.; Dr. C. A. White, collector; one specimen; Museum number, 2354; lot number, 4.

178. *Andromeda! protogæa?* Heer.

Clear Lake, Cal.; G. F. Becker, collector; eleven specimens; Museum number, 2353; lot number, 10. Kudlisart, North Greenland; A. A. Ackerman, collector; one specimen; Museum number, 2356; lot number, 44.

VACCINACEÆ.

EUVACCINIEÆ.

179. *Vaccinium Coloradense* n. sp. Pl. III, Fig. 4, 5.

Ryolite beds, Silver Cliff, Colo.; C. W. Cross, collector.

Leaves small, oval, pointed at apex, narrowed to the base, coriaceous and very entire, lateral nerves camptodrome close and forked at apex, 6-7 pairs in leaves 16 millimeters long 6 millimeters broad; angle of divergence of the nerves 25-30°. Related to *V. acheronticum* Heer Fl. Tert. Helv., Pl. CI, f. 29, with the veins forking near the borders as in *V. Orei*, fig. 35, same plate.

Two specimens; Museum number, 2357; lot number, 209.

Ryolite beds, Silver Cliff, Colo.; C. W. Cross, collector; one specimen; Museum number, 2372 (on same stone as number, 2371); lot number, 209.

CORNACEÆ.

180. *Cornus ferox* Ung.

Kudlisart, North Greenland; A. A. Ackerman, collector; one specimen; Museum number, 2368 (on same stone as number 2366); lot number 44.

181. *Cornus rhamnifolia?* O. Web.

New Jersey? Collector unknown; two specimens; Museum number, 2360; lot number, 16.

182. *Cornus Studeri*? Heer.

"P. Y. station, near Messa station;" received from W. S. Yeates; one specimen.

Agrees with the figure and description in Heer Fl. Tert. Helv., p. 27, Pl. CV, f. 18-21. The two lower pairs of nerves from above the base are opposite, but the acute divergence of the secondaries is the same. As the upper part of the leaf is destroyed the identification is not certain.

Museum number, 2359; lot number, 9.

ARALIA CEÆ.

183. *Aralia Browniana* Heer.

Kudlisart, North Greenland; A. A. Ackerman, collector; two specimens; Museum number, 2358; lot number, 44.

ROSACEÆ.

184. *Cratægus antiqua* Heer.

Kudlisart, North Greenland; A. A. Ackerman, collector; one specimen; Museum number, 2267 (on same stone as number 2266); lot number, 44.

185. *Cratægus Holmesii*, n. sp. Pl. III, Figs. 7-9.

Ryolite beds, Silver Cliff, Colo.; W. H. Holmes, collector.

Leaves small, coriaceous, oblanceolate-spathulate, gradually narrowed to the base from an obtuse truncate or acute apex; primary nerve broad; secondaries thick, very oblique, simple, parallel, the lowest pair opposite and emerging from above the base of the leaf. The leaves, mostly in fragments, vary from 18 to 30 millimeters long, 4 to 10 millimeters broad above the middle or in the upper part, gradually decurring to a comparatively long petiole 15-16 millimeters long, inflated at the point of attachment; secondaries 5-6 pairs, at an angle of divergence of about 20°, deeply impressed upon the leaf which appears thus folded along them and simply dentate on the borders by the excurving points of the nerves. These leaves resemble those of *Cratægus spathulata* Mich. and also of *C. tomentosa* in some of the varieties, being however much smaller. But for the long petiole and the nervation very distinct, not obscured by intermediate nerves or tomentum, these leaves could be referred to the genus *Cercocarpus* H. B. K.

Seven specimens; Museum number, 2381; lot number, 209. /o

LEGUMINOSÆ.

186. *Leguminosites*, spec.

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2381; lot number, 8.

AMPELIDÆÆ.

187. *Cissus lævigata* Lx.

Near False Creek, Southeastern Utah; G. K. Gilbert, collector; one specimen; Museum number, 2401; lot number, 21.

188. *Cissites microphyllus*, n. sp. Pl. III, Fig. 11.

Clear Lake, Cal.; G. F. Becker, collector.

Leaf small, ovate pointed, enlarged above the base and rounded in narrowing to the petiole (broken); border simply dentate; nervation sub-tripalmatifid; primary nerves slightly more distant from the lowest pair of the secondaries and parallel to them, much branched on the lower side; secondaries simple or forking near the borders, all the divisions craspedodrome.

This small leaf is two centimeters long, one and one-half centimeters broad below the middle, secondaries four pairs; angle of divergence 40°.

One specimen; Museum number, 2400; lot number, 10.

ANACARDIACEÆ.

189. *Rhus bella*? Heer.

Kudlisart, North Greenland; A. A. Ackerman, collector; one specimen; Museum number, 2379; lot number, 44.

SAPINDACEÆ.

190. *Sapindus angustifolius* Lx.

Ryolite beds, Silver Cliff, Colo.; C. W. Cross, collector; one specimen; Museum number, 2371; lot number, 209. *pl. 3, fig. 6*

191. *Acer vitifolium* Al. Br.

Wytheville, Va.; Howard Shrieve, collector; one specimen; Museum number, 2370; lot number, 24.

RHAMNEÆ.

192. *Rhamnus Cleburni* Lx.

Upper Kanab Valley, Utah; C. D. Walcott, collector; two specimens; Museum number, 2373; lot number, 81.

193. *Rhamnus Dechenii* Web.

Locality and collector unknown; two specimens; Museum number, 2374; lot number, 15.

194. *Rhamnus Goldianus* Lx.

Ryolite beds, Silver Cliff, Colo.; C. W. Cross, collector; one specimen; Museum number, 2375; lot number, 199.

195. *Rhamnus intermedius* Lx.

Locality and collector unknown; one specimen; Museum number, 2376; lot number, 28.

TILIACEÆ.

196. *Grewiopsis acuminata*, n. sp. Pl. III, Fig. 12, 13; Pl. IV, Figs. 1, 2.

"P. Y. station No. 49, near Messa station;" received from W. S. Yeates.

Leaves rhomboidal-oval, acuminate, wedge form at base in narrowing to the petiole, dentate on the borders, obscurely palmate-nerved; lateral primary nerves two, joining the middle a little above the base of the leaves, slightly more oblique than the secondaries and a little more distant of the lower pair of secondaries than these are from each other; secondaries slightly curved in passing to the borders craspedodrome.

The leaves vary much, especially in width, from 5 to 9 centimeters long and 3 to 4½ centimeters broad in the middle, the acumen being 6 to 8 millimeters long. The medial nerve like the secondaries is distinctly marked but not broad; the lower primaries are oblique, passing nearly straight to the borders, at an angle of 30°; the secondaries, 5 to 6 pairs, are a little more open and curved in passing up, entering each one of the small rather obtuse teeth of the borders. The areolation is made by transverse nervilles anastomosing at right angles to the nerves near the borders by short divisions passing up the sinuses or curved along the borders.

The species is very similar to *G. viburnifolia* Ward, Types of the Laramie Flora, Bulletin U. S. Geol. Surv., No. 37, p. 89, Pl. XL, f. 2, from which it differs by the leaves being generally narrower at the cuneiform base with a long, sharply-pointed acumen; the teeth less numerous, less marked, and obtuse, effaced from the middle downward. Except the acumen the difference is not very great, and as those leaves differ much in their width they might (but for the apex) be referred to the same species. The petiole is of the same length, about 2 centimeters.

Eight specimens; Museum number, 2363; lot number, 9.

Upper Kanab Valley, Utah; C. D. Walcott, collector; three specimens; Museum number, 2365; lot number, 8.

197. *Grewiopsis* Walcott, n. sp. Pl. IV, figs. 3, 4.

Upper Kanab Valley, Utah; C. D. Walcott, collector.

Differs from *G. acuminata* by the broader leaves, scarcely dentate on the borders, and apparently not acuminate. There is, however, a difference in the leaves which are more or less dentate on the border, and as the top of the three leaves of this species are destroyed they may be the same, there being scarcely any difference in the nervation.

Three specimens; Museum number, 2364; lot number, 8.

STERCULIACEÆ.

198. *Pterospermites dentatus*? Heer.

Upper Kanab Valley, Utah; C. D. Walcott, collector; one specimen; Museum number, 2399.

NYMPHÆACEÆ.

199. *Nymphæa*? scars of, on roots.

"Mouth of Indian Creek;" collector unknown; two specimens; Museum number, 2405; lot number, 42.

MAGNOLIACEÆ.

200. *Magnolia Inglefieldi* Heer.

Amethyst Mountain, Yellowstone National Park; W. H. Holmes, collector; two specimens; Museum number, 2382; lot number, 31.

RANUNCULACEÆ.

201. *Dewalquea Haldemiana* ? Sap. et. Mar.

Upper Kanab Valley, Utah; C. D. Walcott, collector.

This fragment is similar to those figured by Heer. from Patoot. Fl. Foss. Arct. VII, Pl. LV. fig. 19 a. The form of the leaf, its round narrowed base, the thick median nerve, the total erosion of the lateral ones and the entire borders are the same. The fragment, however, is too small for positive identification.

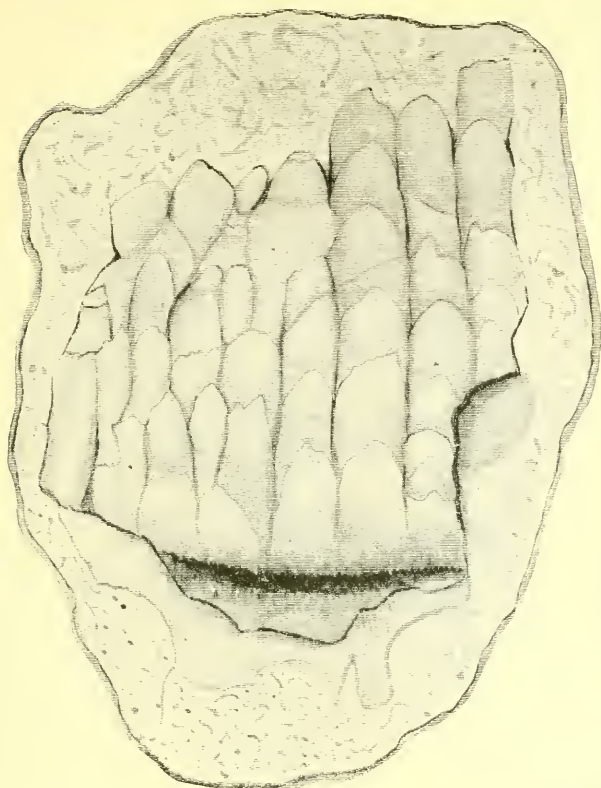
PLANTS OF UNCERTAIN RELATION.

202. *Phyllites fraxineus*, n. sp.

Bridgeton, N. J.; J. B. Marcou, collector; one specimen; Museum number, 2397; lot number, 207.

203. *Phyllites mimusopsoideus*, n. sp.

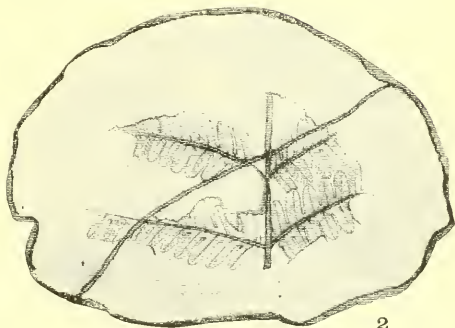
Bridgeton, N. J.; J. B. Marcou, collector; one specimen; Museum number, 2396; lot number, 207.



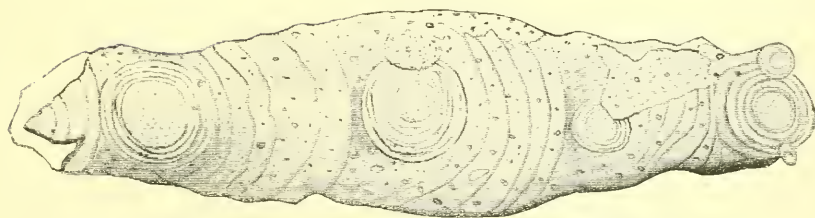
1



2a



2



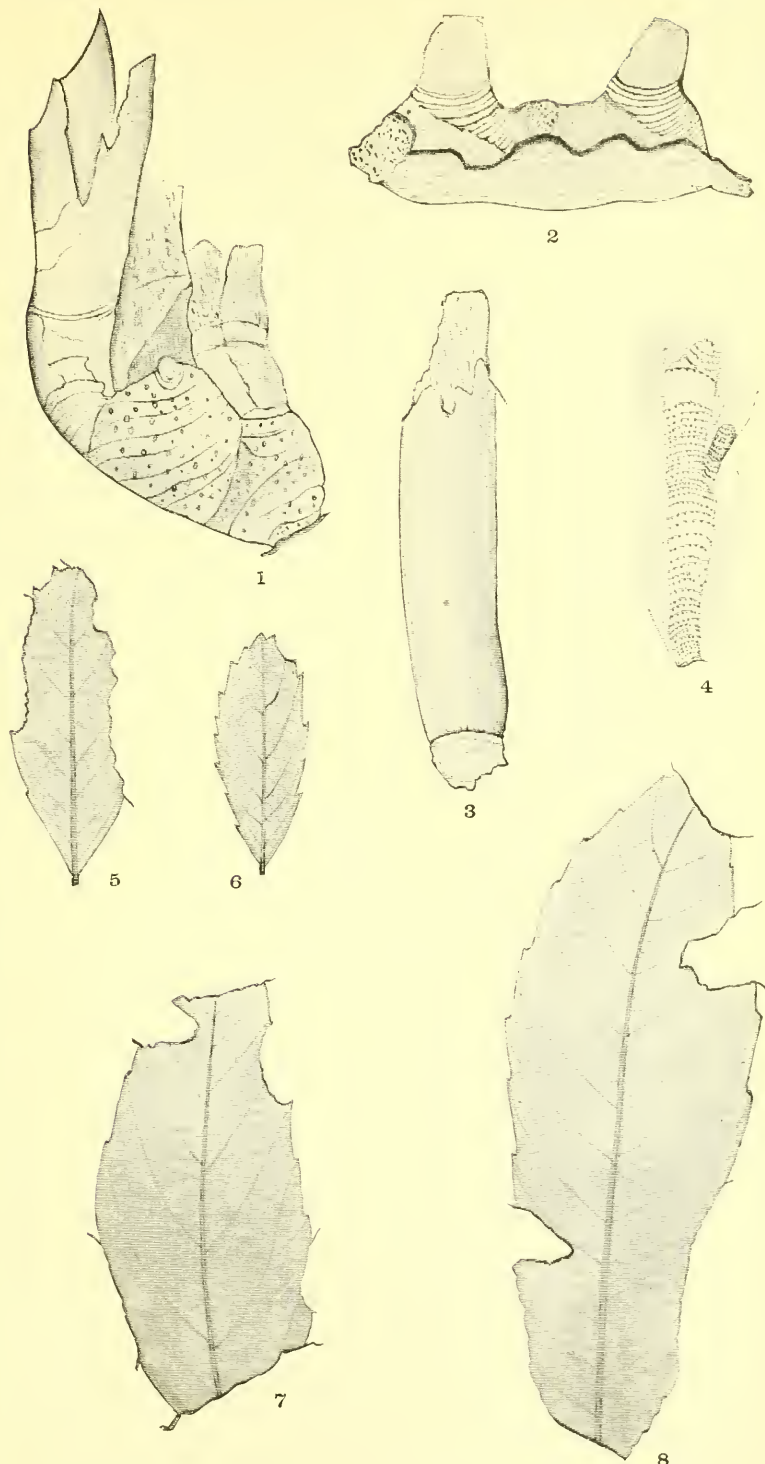
3

1—*Fittonia?* spec. (p. 32).

2—*Pecopteris Powellii*, n. sp. (p. 26).

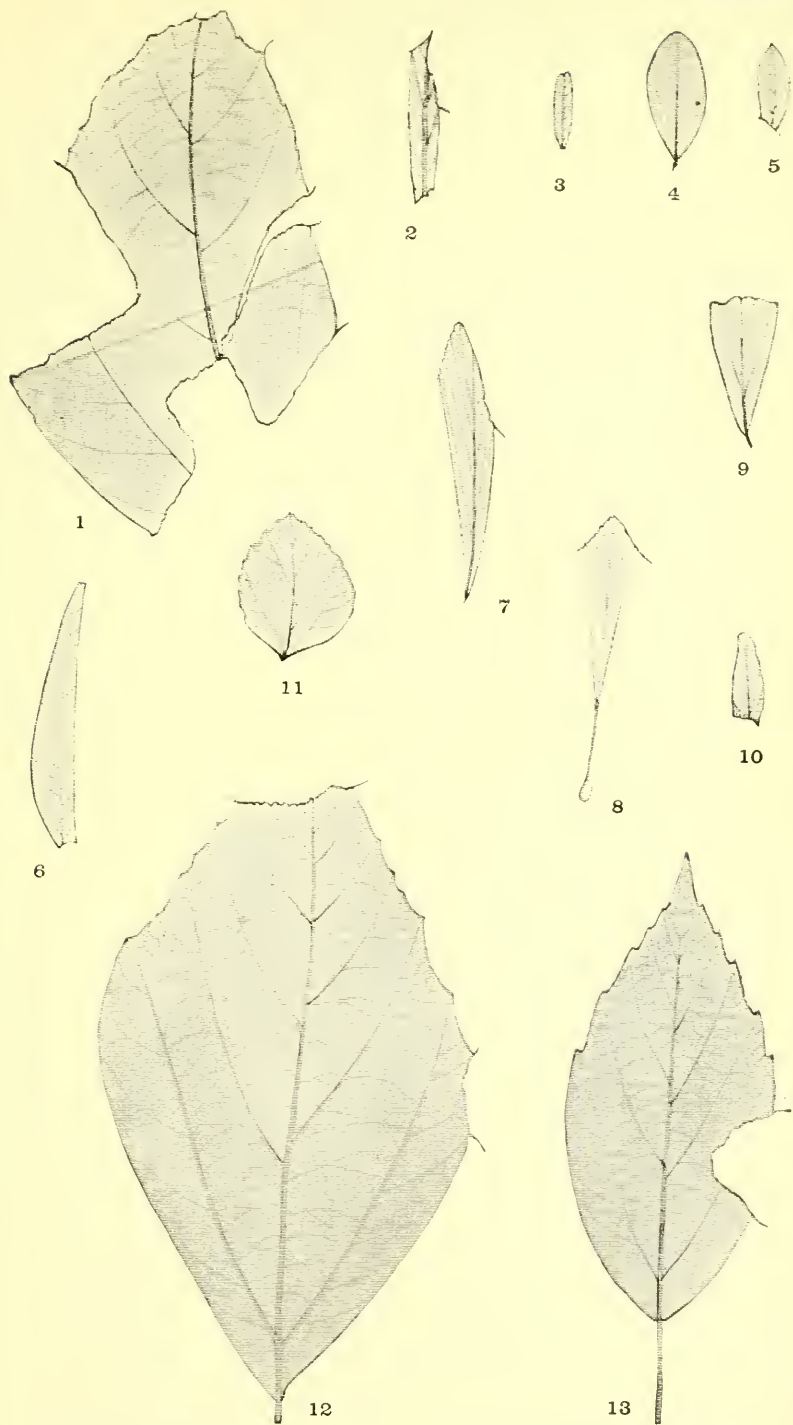
2a.—Same, enlarged pinnule.

3.—*Caulinites Beckeri*, n. sp. (p. 36).



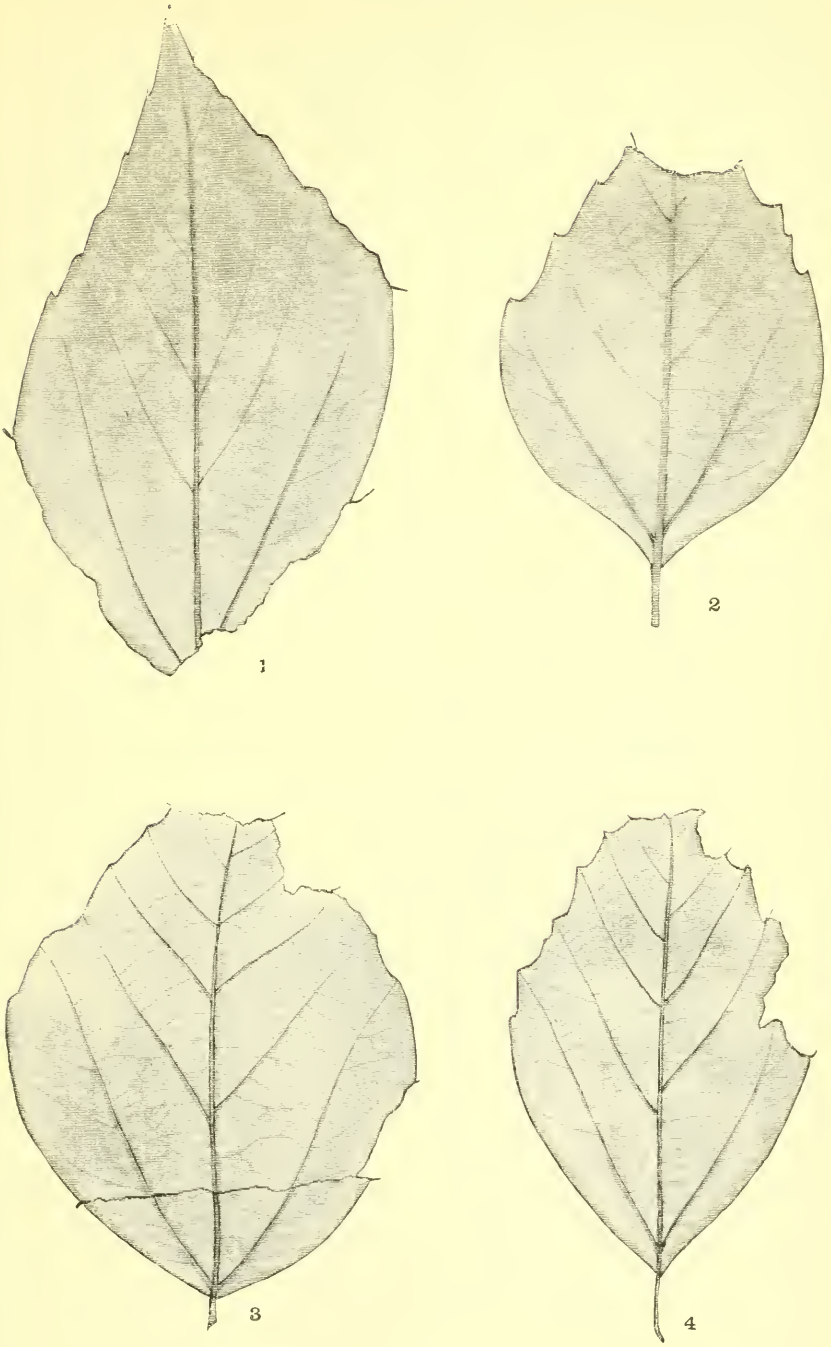
1-4.—*Cudlinites Beckeri*, n. sp. (p. 36).
5, 6.—*Quercus Crossii*, n. sp. (p. 39).

7 8.—*Quercus Gaudini* Lx. (p. 39).



1.—*Populus denticulata* Heer. (p. 40).
 2, 3.—*Andromeda linearifolia*, n. sp. (p. 42).
 4, 5.—*Vaccinium Coloradoense*, n. sp. (p. 42).
 6.—*Sapindus angustifolius* Lx. (p. 43)

7-10.—*Crataegus Holmesii*, n. sp. μ 43
 11.—*Cissites microphyllus*, n. sp. (p. 44).
 12, 13.—*Grewiopsis acuminata*, n. sp. (p. 44).



1, 2.—*Grewiopsis acuminata*, n. sp. (p. 44).
3, 4.—*Grewiopsis Walcottii*, n. sp. (p. 45).