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Bartsch
Cretaceous Flora
of Western Iowa

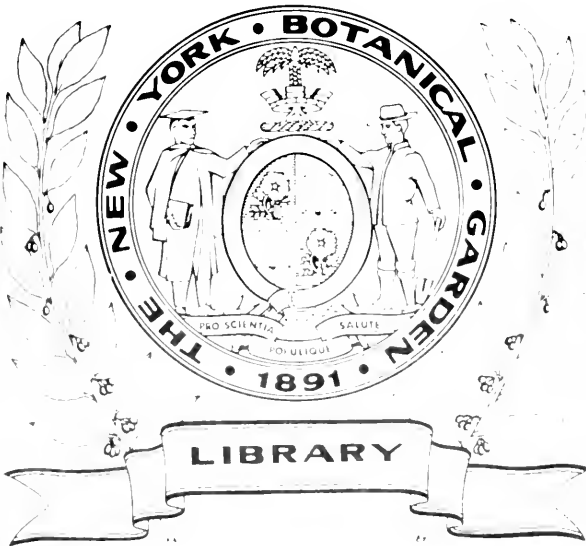
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care of such lands or for their purchase. The result in Massachusetts of a very simple effort has in five years proved most gratifying to the projectors as to every lover of his native land. Thousands of acres have already been rescued from spoliation and subjected to intelligent management such as will eventually result in the attainment of all the beneficent ends for which public parks exist. In Iowa nothing is done; nothing will be done until somebody or some association of our citizens make a beginning. That the effort will one day be made there is no doubt. Whether it shall be made in time to save that which Nature in this direction has already committed to our hands is a question. Is not the problem worthy the consideration of the Iowa citizen and legislator and does it not open to us a field where by practical activity we may again show before the world our practical sense and wisdom.



NOTES ON THE CRETACEOUS FLORA OF WESTERN IOWA.

BY PAUL BARTSCH.

A YEAR ago I received from the State University for identification a quantity of material containing fossil leaves. The rock containing the fossils is a very hard ferruginous arenaceous shale, belonging to the Dakota group of the Cretaceous strata. It was taken from the Holman Cut, Woodbury Co., NE. qr., Sec. 30, Twp. 88, R. 47.

Mr. Bain gives the following table of the strata in the locality concerned:

12	Löss with some concretions	20 feet
11	Sandstone, yellow to white	20 "
10	Shale, lignite in part	1½ "
9	" white to yellow or gray	4 "
8	" dark gray, argillaceous	3 "
7	" white, very silicious	2 "
6	" dark gray	2 "
5	" gray to yellow	10 "
4	" black to gray	1½ "
3	" grayish yellow with ferruginous disseminations	2 "
2	" fire clay	8 "
1	" gray to yellow, iron stained	10 "

Number 5, he continues "bears a great many crystals of selenite, also large ferruginous boulders of sandstone in which numerous imprints of Dakota leaves are imbedded."

The mode of occurrence of these leaves is somewhat variable. At times they appear horizontally flattened, parallel to the plane of deposition. Then again we find them bent, twisted, torn, and mixed up in general confusion.

Occasionally the rock seems composed entirely of fossil

leaves for a thickness of several inches as if the wind had piled them up and they had become fossilized in this state. Some of the leaves are preserved in such a perfect state that they must have grown at, or at least very near the place where they were found; transportation from a distance would certainly have more or less damaged them.

If we may take the character and perfection of the fossils as evidence we can picture to ourselves the surroundings of Sioux City in the early Cretaceous as a scene of swamps and bayous with an occasional strip of high land which was covered by a mixed forest. The autumn winds that shook the leaves from the trees carried them to the marshes where they became water-soaked, sank, and were buried under the sediments borne in by streams swollen with autumnal rains. The finer silt sifted through the coarser sand and thus softly covered and preserved the leaves in the minutest detail to the present day.

The following species have been authentically determined:

1. *POPULUS KANSASEANA* Lesq.

Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., P. 42, Pl. XVII., Figs. 1-7.

Three specimens in a fair state of preservation are in the collection.

2. *POPULUS HYPERBOREA* Heer.

Heer, Fl. Foss. Arct., vol. 3, pt. 2, p. 106, Pl. XXIX., Figs. 6-9; Pl. XXVII., Fig. 8d; Pl. XXX., Fig. 2b; vol. 6, Abth. 2, p. 64, Pl. XXVII., Figs. 6, 7; Pl. XXI., Fig. 1 a. Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 43, Pl. III., Figs. 9-11; Pl. VIII., Fig. 1; Pl. XLVII., Fig. 5.

A single good specimen is listed.

3. *SALIX PROTEAFOLIA* var. *LONGIFOLIA* Lesq.

Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 50, Pl. LXIV., Fig. 9.

Several fragments occur most of which show characteristic details well.

4. *MYRICA LONGA* Heer.

Protooides longus Herr. Fl. Foss. Arct., vol. 3, pt. 2, p. 110, Pl. XXXI., Figs. 4, 5; Pl. XXIX., Fig. 8 b; *ibid.*, vol. 6, 2 Abth.: p. 65, Pl. XVIII., Fig. 9 b; Pl. XXIX., Figs. 15-17; Pl. XXXIII., Fig. 10; Pl. XLI., Fig. 4b, d. Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 67, Pl. III., Figs. 1-6.

One specimen was found.

5. *FICUS MAGNOLLEFOLIA* Lesq.

Cret. and Tert. Fl., p. 47, Pl. XVII., Fig. 5, 6. Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 79, Pl. XVI., Fig. 4.

One specimen listed.

6. *FICUS INÆQUALIS* Lesq.

Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 82, Pl. XLIX., Figs. 6-8; Pl. L., Fig. 3.

A single specimen listed.

7. *DAPHNOPHYLLUM DAKOTENSE* Lesq.

Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 99, Pl. LI., Figs. 1-4; Pl. LII., Fig. 1.

Only one specimen listed.

8. *CINNAMOMUM ELLIPSOIDEUM* Sap. & Mar.

Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 105, Pl. LI., Figs. 8-9.

A single specimen very nicely preserved, listed.

9. *CINNAMOMUM SEZANNENSE* Watelet.

Daphnogene sezannensis (Wat.) Sap. & Mar., Fl. de Sezanne, p. 309, Pl. VIII., Fig. 5. (fragment); Sap. & Mar., Veg. Marne's Heers. de Gelinden, p. 47, Pl. VI., Figs. 5, 6. *Cinnamomum sezannense* Sap. & Mar., Revis. Fl. Gelinden, p. 60, Pl. IX., Figs. 2-6. Heer., Fl. Foss. Arct., vol. 6, 2 Abth., p. 77, Pl. XIX., Fig. 8; Pl. XXXIII., Figs. 11, 12, vol. 7, p. 30, Pl. LXI., Fig. 1 a. Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 107, Pl. XII., Figs. 6, 7.

A single incomplete specimen was found making the determination somewhat doubtful.

10. *DIOSPYROS PRIMLEVA* *Heer*.

Phyll. Cret. du Nebr., p. 19, Pl. I., Figs. 6, 7; Fl. Foss. Arct., vol. 6, 2 Abth., p. 80, Pl. XVIII., Fig. 1; vol. 7, p. 31, Pl. LXI., Figs. 5 a, b, c; Newberry, Later Ext. Fl., p. 8, Illustr. Cret. and Tert. Pl., III., Fig. 8; Lesq., Cret. and Tert. Fl., p. 59. Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 109, Pl. XX., Figs. 1-3.

A single specimen listed.

11. *DIOSPYROS PSEUDOANCEPS* *Lesq.*

Report of the Geological State Survey of Minnesota, by Prof. Winchell, unpublished. Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 111, Pl. XXII., Fig. 1.

A single specimen listed.

12. *DIOSPYROS ROTUNDFOLIA* *Lesq.*

Cret. Fl., p. 89, Pl. XXX., Fig. 1; Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 112, Pl. XVII., Figs. 8-11.

A single specimen was listed.

13. *INGA CRETACEA* *Lesq.*

Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 153, Pl. LV., Fig. 11.

A single specimen was listed.

14. *RHAMNUS TENAX* *Lesq.*

Cret. Fl., p. 109, Pl. XXI., Fig. 4. Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 170, Pl. XXXVIII., Fig. 6.

Two well preserved specimens were found.

15. *RHAMNUS INÆQUILATERALIS* *Lesq.*

Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 170, Pl. XXXVII., Figs. 4-7.

Two good specimens were obtained.

16. LIRIODENDRON GIGANTEUM *Lesq.*

Cret. Fl., p. 93, Pl. XXII., Fig. 2; Cret. and Tert. Fl., p. 74. Lesq., Fl. Dak. Gr., U. S. Geo. Sur., Mon. XVII., p. 206, Pl. XXV., Fig. 1; Pl. XXVI., Fig. 5; Pl. XXVII., Fig 1.

A single fragment was found which appears to represent this species.

A number of complete specimens not yet determined are in the collection, besides hundreds of fragments, some (monocotyledonous), too fragmentary to permit of positive identification.

Thanks are due F. H. Knowlton, of Washington, D. C., for assistance in making the determinations here recorded. The locality has never been adequately worked by the collector. It is hoped that future effort may result in bringing to light a much larger list of these most interesting organic remains.

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