

In examining the figures obtained it is seen there are six species in which the spring wood tracheides are longer than those of the summer, while seven species have the summer tracheides the longer. The species in each group show variations in hardness and strength, so that taking the length of the tracheides as a factor by itself nothing can be deduced in regard to the quality of the wood, but taking the length and comparing it with the width of the cells, and again comparing the width and the thickness of walls together, and the amount of the spring and summer wood, the strength can be determined within limits in each species.

For instance, in *P. ponderosa scopulorum* the spring tracheides are 129.6 times as long as they are wide, and the summer tracheides 164.4 times their width, the thickness of their walls is not nearly as great as that of many of the others, but when the thickness is compared with the width of the cells, it is found to be fairly thick, and as about two-thirds of the annual ring is summer wood, we have an explanation of the strength of the wood.

Taking any of these factors alone, it does not mean anything, as the length of the elements may be very considerable, but the width may be also; then, again, the elements may have rather thin walls, if the thickness of the wall alone were considered. But when the size of the cell as a whole is taken into consideration along with the thickness, the proportion of wall may be greater than the figures representing the thickness indicate.

CONTRIBUTIONS TO THE FLORA OF INDIANA.

STANLEY COULTER.

The notes included in this contribution are based, partly, upon a critical study of certain species and partly upon reports and materials submitted by those interested in perfecting our knowledge of the flora of the State. They are presented in the hope that they may prove of interest and value to the botanical workers of the State.

Pinus Strobus L. White Pine.

From Mr. C. F. Very, of New Albany, I have received abundant specimens of the leaves and cones of this species with the following notes. The specimens are from trees planted by the father of Mr. Very some seventy years ago, and one of them is about sixty feet in height, with a

trunk diameter of eighteen inches: "They came from that native grove of white pine in the northeastern part of Floyd County, near the line of Clark. At the time my father got them, about seventy years ago, there was quite a grove of the white pines there, one of them being quite an old tree, which would throw them back of the time of white men. The Knobs in that region are now covered with old field scrub pine" (P. Virginiana Mill). The note is interesting as extending the local range of the white pine.

Eriophorum gracile Koch, as given in the State Flora, page 655, becomes *E. paucinervium* (Engelm.) A. A. Eaton, as will be seen by reference to Britton's Manual, page 182, and the latter name should replace it.

Eriophorum gracile Koch, of Britton's Manual, but not of the Illustrated Flora, has been collected by Mr. C. C. Deam, of Bluffton, in Wells County. The determination of the form was made by E. S. Steele, Assistant Botanist, Department of Agriculture, Washington.

E. paucinervium, therefore, replaces *E. gracile* of the State Flora, and *E. gracile* of Britton's Manual is to be added to the Flora.

Quercus Texana Buckley.

In Britton's "Manual of the Flora of the Northern States and Canada," page 333, it will be seen that this species becomes *Quercus Schneekii* Britton (*Q. Texana* Sargent, in part, not Buckley). Under the former name it was reported in the "Catalogue of the Flowering Plants and of the Ferns and Their Allies Indigenous to Indiana,"¹ as occurring in Gibson, Posey and Knox Counties, upon the authority of Dr. J. Schneek. The statement was also made that it would be found to extend farther northward along the Wabash River. Specimens have come into my hands since that report from Vermillion County, where it occurs in considerable abundance. While closely allied to *Q. palustris* DuRoi, with which it is doubtless often confused, it is also liable to be mistaken on casual inspection for *Q. rubra* L. In addition to the leaf characters which serve to separate the forms, I have found the shape of the buds and color of the twigs of value. The buds are more sharply conical and apparently much more compactly built than in either *Q. rubra* or *Q. palustris*. The twigs are of a lighter, more definite gray than in the other forms and have in addition a peculiar dusty appearance, because of their being slightly tomentulose. A reference to Britton's Manual as cited above will give leaf and fruit characters. I submit with this specimens in flower and fruit, labelled *Q. Texana* Buckley,

¹ Report of State Geologist, p. 710.

which were collected in low bottoms two miles east of Mt. Carmel, Ill., by Dr. J. Schneck. In the Catalogue of the State Flora, therefore, *Q. Schneckii* Britton should replace *Q. Texana* Buckley, and Vermillion County be added to the range there assigned.

Quercus ellipsoidalis E. J. Hill. Hill's Oak.

Mr. Hill informs me that this oak occurs in the northwestern counties of the State. The range as given in Britton's Manual, page 334, is Illinois, Michigan and Minnesota. It is a tall tree with drooping lower branches, close, gray bark, the innermost layer being yellowish. The leaves are oval to obovate-orbicular in outline, from 6-15 cm. long when mature, deeply 5-7 lobed, with rounded sinuses; shining above, glabrous or nearly so beneath; base broadly cuneate to truncate; petioles 2.5-5 cm. long. Acorn ellipsoid to subglobose, 1-2 cm. long, 1-1.5 cm. thick, 1-2 times as long as cup. (Britton's Manual, *loc. cit.*) The species should be added to the flora.

Quercus pagodaefolia (Ell.) Ashe.

It will be recalled that last year² I expressed the opinion that the above form was "so well marked in our area as to seem entitled to varietal, if not, indeed, to specific rank." I further stated, after reviewing the history of the species, that in my judgment "it should be written *Q. digitata pagodaefolia* Ell., and given a place in the flora."

In Britton's Manual, page 334, it appears as above, with the following leaf and fruit description:

"Leaves oval to oblong in outline, cuneate to truncate at base, 2-3 dm. long, deeply 5-11 lobed, persistently white-tomentulose below, dark green above, the lobes narrowly triangular, spreading or somewhat ascending, usually entire; twigs tomentose; petioles 3-6 cm. long; cup sessile, shallow, its bracts appressed; acorn globose, about 1 cm. in diameter; about one-half enclosed in cup."

The tree, which is from 100-110 degrees high in its maximum development, is usually found in wet or moist soil. In the southwestern counties, Dr. J. Schneck. I submit for your inspection specimens collected by Dr. Schneck near East Mt. Carmel, Ind.

Q. pagodaefolia (Ell.) Ashe is, therefore, to be added to the flora, having a place between *Q. digitata* (Marsh) Sudw., and *Q. Marylandica* Muench, being given the range assigned above.

² Proceedings Indiana Academy Science, Vol. 11, p. 142.

Quercus Alexanderi Britton. (Manual of the Flora of the Northern States and Canada, page 336.)

To this species is to be referred the forms cited in the State Catalogue, page 713, under *Q. Prinus* L.

Q. Alexanderi is closely allied to *Q. acuminata* (Michx.) Houda, including really what were formerly regarded as broad-leaved forms of the latter species. The description is as follows:

"A tree similar to the preceding species (*Q. acuminata*), but the leaves broadest above the middle, obovate or oblong-obovate; eup cupulate, short-stalked or sessile, shallow; acorn ovoid, 1.5-2 cm. long, 2-3 times as high as the cup; bark; especially that of the old trees, flaky."

Probably fairly distributed throughout the State in the same situations as *Q. acuminata*.

In some respects, notably the venation of the leaf and the acorn, the form closely approaches *Q. Prinus*. The catalogue should, however, be corrected to read as indicated by this paragraph. Specimens of the leaves are herewith presented.

Sisymbrium altissimum L.

This species, adventive from Europe, is reported by Dr. Robert Hessler as growing along the State Line Railroad, east of Lake Cicott, Cass County, June 7, 1901; Lake Maxinkuckee, Marshall County, H. W. Clark. The species is easily distinguished from the other members of the genus by its height, from 6-9 dm.

Vicia angustifolia Roth.

"Growing plentifully along the old Eel River railroad in the northern portion of Logansport. I had not noticed it in former years and it must have been introduced recently." (Robert Hessler.)

Britton, in his manual, page 566, gives the range of the species from Nova Scotia to Florida. This record is a western extension of the range. The inflorescence being axillary, separates it readily from the other members of the genus except *V. sativa* L. and *V. sepium* L.; from both of which it is easily distinguished by the character of the leaflets.

Scrophularia leporella Bicknell.

"Lake Cicott, June 7, 1901, in flower; Lake Maxinkuckee, July 21, 1901, in fruit. Plants are more upright and bloom much earlier than the other species, at least by the end of May." (Robert Hessler.) Also collected at Lake Maxinkuckee by H. W. Clark.

The form is further separated from *S. Marylandica* L. by its leaves being "incised dentate" instead of sharply serrate; the mostly alternate instead of opposite bractlets; the sharply contracted throat of the corolla, and the corolla being dull instead of shining within.

An examination of the specimens in the Purdue Herbarium show that all of the specimens collected in flower in May and June are to be referred to this species, which will probably be found generally distributed throughout the State.

The following additions are also reported by Mr. H. W. Clark, but as specimens have not been seen they are included only tentatively: *Sarastana odorata* (L.) Scribn. Holy Grass. Seneca Grass.

Lake Maxinkuekee, Marshall County. This locality would be a southward extension of range in the central United States, the recorded range being "south to Wisconsin."

Lilium umbellatum Pursh. Western Red Lily.

Lake Maxinkuekee, Marshall County. The only objection to this reference seems to lie in the fact that it is a dry soil plant, and the further fact that the majority of Mr. Clark's Maxinkuekee collections were in the marginal zones near the lake. The leaf character and arrangement would, however, seem sufficient to separate it readily from any related forms.

The following species are to be added upon the authority of Britton's "Manual of the Flora of the Northern States and Canada." I have not as yet had opportunity to examine Herbarium specimens to verify the references, but have no reason to doubt their accuracy.

Lycopodium porophyllum Lloyd and Underw. Rock Club-moss.

Britton's Manual, page 1037. "Differs from *L. lucidulum* in its nearly linear entire leaves and smaller size, and from *L. Selago* in the bases of its leaves, which are flattened. On sandstone rocks, Wisconsin, Indiana and Alabama." The familiarity of Dr. Underwood with the Pteridophytes of the State places this reference beyond question.

Talinum rugospermum Holzinger. Rough-seeded Talinum.

Britton's Manual, page 1047. "Similar to *T. teretifolium* and confused with that species. * * *T. teretifolium* differs in having short, blunt style-lobes, oblong anthers and smooth, black seeds. In dry soil Indiana to Wisconsin and Minnesota." In *T. rugospermum* the seeds are pale and roughened.

The following additional stations are reported by Dr. Robert Hessler and indicate work of a character that would much simplify the labors of the Biological Survey if it could become more general:

Xyris flexuosa Muhl. Slender Yellow-eyed Grass.

Low places along Lake Cicott, Cass County, August, 1901. Previous reported stations are Laporte, Lake and Kosciusko counties.

Veratrum Woodii Robbins. Wood's False Hellebore.

Found several miles southeast of Logansport, Cass County. No flowers developed, probably on account of the extreme dryness of the season.

Trillium nivale Riddell. Early Wake Robin.

On rocky, shaded hillsides, rare. This species is also found in abundance in Tippecanoe County, on the grounds of the Germania Club south of LaFayette.

Jeffersonia diphylla (L.) Pers. Twin-leaf.

A patch on a shady hillside east of Logansport, Cass County.

Hamamelis Virginiana L. Witch Hazel.

On limestone cliffs along the Wabash River, near Logansport.

Floerkea proserpinacoides Willd. False Mermaid.

In low, moist woods at the Northern Indiana Hospital for Insane, Cass County. A large patch in bloom, May 2, 1901.

Oenothera laciniata Hill. Sinate-leaved Evening Primrose.

Along the Eel River railroad, about two miles east of Logansport, Cass County. Spreading rapidly along the right of way of the railroad. Previous records for the State are Vigo, Daviess and Fayette counties.

Lysimachia quadrifolia L. Whorled Loosestrife.

In sandy soils about Lake Maxinkuckee, Marshall County.

Naumburgia thyrsiflora (L.) Duby. Tufted Loosestrife.

Wet places about Logansport, Cass County.

Asclepias amplexicaulis J. E. Smith. (*A. obtusifolia* Michx.) Blunt-leaved Milkweed.

A cluster found in a sand field near Lake Cicott, only a short distance from the railroad.

The following forms are spreading with extreme rapidity in locations indicated:

Camelina satira (L.) Crantz. False Flax.

In Logansport, along the right of way of the Wabash railroad.

Micranthella lobata (Michx.) Greene. Wild Balsam Apple.

Sicyos angulatus L. Star Cucumber. One-seeded Bur Cucumber.

"These vines, formerly rarely seen in Cass County, are now very common along the margins of the Wabash River, covering shrubs and small trees profusely and often crowding out small plants." (R. Hessler.)

Should the nomenclature of Britton's Manual, 1901, be generally adopted, many new species would be added to the flora of the State, since in that work any recognizable plant segregate is given specific rank. No sweeping changes should be made, however, until there has been sufficient time to judge as to whether the species there announced are possible of recognition except by the comparative methods of a great herbarium.

