

A very paradise for a collector of aquatic vegetation is a large shallow pond near Perkins, Oklahoma. Several *Sagittarias*, *Nelumbo lutea*, Pers., *Potamogeton ilitans*, Roth., the latter growing "rarely in ponds" (Gray's Man.), *P. hybridus*, Michx., are most abundant throughout, while near the edges *Heteranthera limosa*, Vahl., *Ludwigia cylindrica*, Ell., *Herpestis rotundifolia*, Pursh, and *Marsilia vestita*, Hook. and Grev., grow ripe.

As before suggested, the special interest of this region lies in the fact of the meeting of two floras and the sometimes abrupt but generally gradual transition of one into the other. The flora can not be studied comprehensively except by an extended period of field work and carefully noting all the environmental conditions. The farther west one goes into the territory, the more sandy and desert the regions become, and such are the variations from some of the more eastern forms, no doubt the result of a change in habitat, that many are classed as varieties. According to Mr. Coville's suggestions in his "Botany of Death Valley Expedition," the shrubs and trees and, on the prairies, the *perennials*, should especially be noted to determine characteristic plants of the flora.

Grateful acknowledgments are due to Dr. John M. Coulter and Prof. E. B. Uline for kindly determining some of the species and checking most of the list of collections.

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REDISCOVERY OF HOY'S WHITE FISH, OR MOON EYE. BY BARTON W. EVERMANN.

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SAXIFRAGACEÆ IN INDIANA. BY STANLEY COULTER.

Represented in Indiana by nine genera, as follows: *Saxifraga* L., *Saxifragella* Torr. and Gray, *Tiarella* L., *Mitella* Tourn., *Heuchera* L., *Parassia* Tourn., *Hydrangea* Gronov., *Philadelphus* L. and *Ribes* L.

The representatives of *Philadelphus* are evident escapes, and their inclusion in former lists is doubtless due to the youthful ebullience of the collectors. Both *P. inodorus* L. and *P. grandiflorus* L. are eastern and southern forms, the former ranging along the mountains from Virginia to Georgia and Alabama, the other along streams from Virginia to Florida. Both are of easy cultivation and escape readily in favorable localities, but so far as I have record have failed to maintain themselves. Until further evidence the genus and included forms should be excluded from state catalogue.

*Saxifraga* is certainly represented in the state by *S. Pennsylvanica* L., which has a fair distribution in the central and northern portions of the state, and which

is represented by numerous herbarium specimens from this region. Possibly *S. Virginensis* Michx. may be added to the list, being reported from Dearborn County by Dr. S. H. Collins, but of which I have seen no specimen. The range does not make it impossible that it is found in the State, although certainly rendering the determination doubtful. The plant is "northward" in its abundant range, though found in Tennessee on the authority of Dr. Gattinger.

*Sullivantia Ohionis* Torr. and Gray has a definite locality of extremely narrow limits on a limestone cliff at Clifty Falls, Jefferson County. From this point all herbarium specimens have come. It is reported by Dr. C. R. Barnes, from near Washington, and by Baird and Taylor, from Clark County. It is, however, certain that the plant does not occur in any abundance, except in the Clifty Falls station. From my own experience in attempting to extend the range of *Sullivantia*, I am inclined to believe that the localities added by Professor Barnes and Messrs. Baird and Taylor were from an incorrect reference of immature forms. The plant is remarkable for its occurrence in widely separate stations. Although the manual range seems broad, an examination of the local lists shows that *Sullivantia Ohionis* is entitled to rank as a *rare* plant.

*Tuaeda cordifolia* L. is reported by Dr. Phinney in his list, which embraces the counties of Jay, Delaware, Wayne and Randolph. I have seen no Indiana specimens of this form. The sixth edition of the manual includes Indiana in the range, which reads, "*Rich, rocky woods, New England to Minnesota and Indiana and southward in the mountains.*" Whether the inclusion of the form is based upon Dr. Phinney's report or not, I am unable to state. The habit of the plant would lead to its occurrence, perhaps, in this particular region, if it extends so far southward. Dr. Phinney reports it as "common" in rich woods. The state catalogue gives the plant, referring it to St. Joseph County, but not giving authority for its inclusion. The form is one of great interest, and efforts should be made in the direction of its rediscovery.

*Mitella diphylla* L. is fairly well distributed, being especially abundant in the central and eastern counties. It is definitely reported from the following counties: Jefferson and Clark in the south, Noble in the north, Putnam in the central, and Jay, Delaware, Randolph and Wayne in the east. It also occurs in relative abundance in Tippecanoe. It is not, however, reported from the southeastern, southwestern or western counties. Its mass distribution is evidently in the central and eastern regions of the State.

*Heuchera* is represented by three species, *villosa*, *Americana* and *hispida*.

*H. villosa* Michx. is reported only from Clark County. It was first collected by Dr. C. R. Barnes, whose determination of the form is verified by specimens in

the Purdue herbarium. It was afterward reported from the same region by Baird and Taylor, who seem to have made no specimens. No notes are at hand concerning the abundance of the form in this single station and nothing concerning the local conditions. The extension of the range of this species from "Rocks, Md., to Kentucky and southward, in and near mountains" of the Fifth Edition of Manual, to "Rocks, Md., to Georgia, west to Indiana and Missouri," of the Sixth Edition, is doubtless, so far as Indiana goes, based upon this collection of Dr. Barnes.

The extreme paucity of notes accompanying, serve to emphasize certain features of the paper, which I had the honor to present to the Academy last year. Beyond the mere fact of the "Station" which might mean any point in an entire county, nothing definite is known concerning this plant, which is *rare* at least in the state.

*H. Americana* L., is much more abundant and more generally distributed than either *H. villosa* or *H. hispida*, indeed with perhaps the exception of *Ribes* and *Hydrangea* the most marked member of the family in the state. It is definitely reported from twelve (12) counties and is probably found in all parts of the state.

*H. hispida* Pursh has been collected from Vigo County by W. S. Blatchley and his determination is verified by a specimen in the DePanw herbarium. I have made no critical study of the form and am not able to pass upon the accuracy of the reference. The range of this species is somewhat strange. Its home seems to be in the mountains of Virginia, it is also reported from Illinois by Dr. Mead, from which point its range is northwestward. We now seem to have an intervening station in Indiana, somewhat the more remarkable as occurring in the lowlands of the state.

*Parnassia Carolinana* Michx. occurs in the northern part of the state, being reported from Noble County by Van Gorder and Kosciusko by W. S. Blatchley, the latter collection being in the DePanw herbarium. The region reported is the one in which the form would be expected in our state. Its range would probably be found to cover most of our northern counties, if investigations were made during July-September.

*Hydrangea arborescens* L., as far as our present knowledge goes, seems to be fairly abundant from northern central counties, southward. It is not, however, reported from the northern tier of counties, although it may occur in favorable localities.

*Ribes* is our most important genus, not only in number of species, but also in individual representatives. Six species are reported as occurring within our limits.

*R. cynosbati* L. is our most common form and, probably, is to be found throughout the state, with the exception, perhaps, of the extreme southwestern counties.

*R. gracile* Michx. is reported definitely only from Vigo County, by W. S. Blatchley, his plant being found in DePauw herbarium. It is probable that some forms reported as *R. rotundifolium* Michx., by earlier collectors, may be referred to this form.

*R. rotundifolium* Michx. is reported from Jefferson County (J. M. C.) and Clark County (B. and T.) No herbarium specimens of these collections are available. It is probable, however, that this species does not occur within the state and that the forms should be referred to *R. gracile*, *rotundifolium* being an eastern and mountainous form extending from western Massachusetts and New York south to North Carolina, following generally the Allegheny range. It is probable that *R. rotundifolium* will have to be excluded from the state list.

*R. oxycanthoides* L. is reported from Noble (Van G.), Jefferson (J. M. C.) and Clark (B. and T.). Though no herbarium specimens have yet been seen, the form doubtless occurs in the state. Specific reports as to its occurrence, with confirmatory specimens, if possible, are greatly to be desired.

*R. floridum* L'Her is reported from Noble to Jefferson, through the eastern counties of the State; it is not reported from western or southwestern counties. While no herbarium specimens have yet come to my notice, it is doubtless a member of our state flora. The latest stations are Montgomery County, near a swamp (single station E. W. Olive). Madison County (Walker).

*R. rubrum* L. var. *subglandulosum* Maxim. is reported from Clark County (B. and T.), and Jefferson (J. M. C.). No herbarium specimens have been examined. The manual range includes Indiana specifically, an addition in 6th ed., probably based upon this citation.

It is remarkable that of the sixteen species representing this family in Indiana (excluding two species of *Philadelphus*) seven are of extreme interest, either because of their rarity or because of their extending previous ranges.

They are:

*Saxifraga Virginiensis*, Michx. [Not authenticated.]

*Sullivantia Ohionis*, Torr. and Gray.

*Tiarella cordifolia*, L.

*Heuchera villosa*, Michx.

*Heuchera hispida*, Pursh.

*Parnassia Caroliniana*, Michx.

*Ribes rubrum*, L., var. *subglandulosum*, Maxim.

Careful search should be made for these exceptional forms in various localities, and in any case where they are noted prompt report, accompanied by verified specimens, should be made.

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THE RANGE OF THE BLUE ASH, *FRAXINUS QUADRANGULATA*. By W. P. SHANNON.

In Gray's Manual of Botany, edition of 1857, we have given as the range of the blue ash, Ohio and Michigan to Illinois and Kentucky. This is nearly equivalent to saying that Indiana is the center of the blue ash region. Let us look farther. In the 1868 edition of Gray's Manual we find the range given as Ohio to Wisconsin, Illinois and Kentucky. Again, in the edition of 1887, it is, Ohio to Michigan and Minnesota, south to Tennessee. In Wood's Botany, 1868, we find, Ohio to Tennessee and Iowa. In Sargent's Forest Trees of North America we find, Michigan and Wisconsin, south to northern Alabama. In Aggar's Trees of the Northern United States we find, Wisconsin to Ohio and Kentucky.

Putting together all of these definitions of the range of the blue ash we conclude that in going east from Indiana the tree disappears before we get through Ohio; in going north it disappears before we get through Michigan; in going northwest we find it beyond Illinois in Wisconsin, Minnesota and Iowa, and that it is very rare in Iowa and Minnesota; in going southwest it disappears somewhere in Illinois; in going south it becomes rare in Tennessee and disappears in northern Alabama. When we take into consideration the great prairies of Illinois, we see that Indiana is yet the center of the range of the blue ash. There is a northwestern extension around the prairie region through Michigan and Wisconsin to Minnesota and Iowa, and a southern extension through Kentucky and Tennessee to Alabama.

It would be difficult to work out the barriers that hold this tree close to Indiana. The purpose of this paper is this, to call attention to the fact that if any forest tree deserves to be called the "Indiana tree" it is the blue ash. Its range, when compared with that of other trees, is a small spot, and Indiana is the center of this spot. If this is an Indiana tree we would like to know its character when compared with other trees. It is always characterized as growing in rich soil. When a boy I heard my father say that he thought the blue ash the most beautiful tree of the forest. Frequently on looking at a large blue ash, I have thought of the truth of his judgment. From its light colored bark, with, sometimes, an imaginary blue tinge, and long straight stem, it contrasted strongly with other trees, so that the blue ash trees were bright streaks in the forest.