

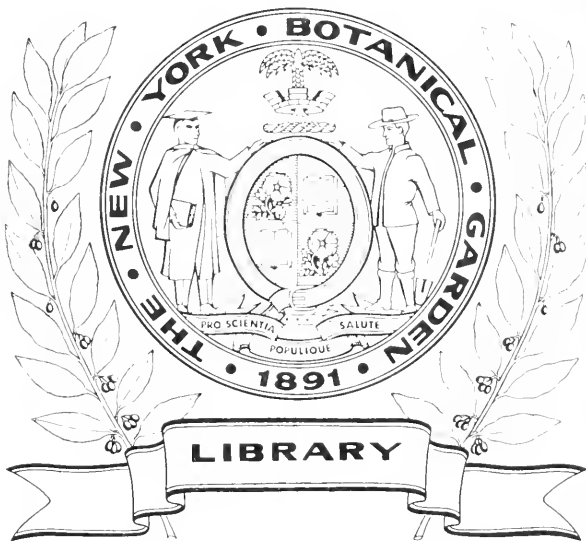
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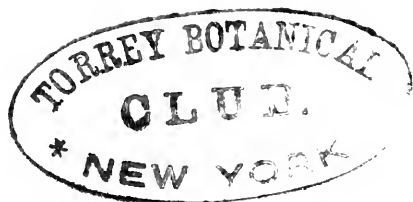
Arthur, J C

Contributions to the Flora
of Iowa

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CONTRIBUTIONS TO THE FLORA OF IOWA.— No. VI.

BY J. C. ARTHUR.

Presented before the Davenport Academy of Sciences, February 8th, 1884.

Only phanerogams have been included, heretofore, in the present series of contributions. In this number an innovation is begun by extending the catalogue to the pteridophytes, which is to be continued, in succeeding numbers, until all the orders of lower plants, in their proper sequence, are eventually included. A large amount of material for this purpose is already on hand. The manner of cataloguing will be essentially the same as observed in the phanerogamic portion, and the whole is intended to finally present a uniform list of the Iowa flora. The numbers are continued from the catalogue of 1876 (Contr. No. I.). Their value lies in securing greater ease of reference, and in permitting subsequent discoveries to be readily referred to their approximate places in the list; for, on account of the numerous interpolations, they no longer serve to show the total number of species recorded.

The practice in the phanerogamic portion has been to use the nomenclature that accords with the latest information, but to adhere to the sequence of orders given in Gray's "Manual," 5th edition. Subsequent changes of synonymy, or of previous changes not known to the writer at the time of publication, have not been recorded. On the other hand, all errors of determination have been corrected in the contribution following their discovery. This leaves the catalogue as accurate as possible in regard to the primary fact of the occurrence of the species within the State, but in some instances quite out of date in regard to synonymy and distribution. These defects can be remedied at some future time by revising the whole list, bringing the synonymy up to date, and adding the localities reported since the first publication.

In enlarging the scope of the catalogue, it becomes necessary to adopt some system of classification for the added portion. Whatever system is used, it is desirable that it be familiar to the several collectors of the State and others assisting in the work, or one easily obtained by them. That given in Bessey's "Botany for High Schools and Colleges" has, therefore, been adopted for the sequence of the orders, as

giving, on the whole, the best uniform classification, in accordance with recent views, that is accessible to all. It will be necessary, however, to reverse the order of the book, and pass from the higher to the lower forms, so as to make the added part of the catalogue continuous with the portion already published. The particular arrangement to be observed for species will be announced for each order when the first list under it is published.

The present contribution contains all the pteridophytes or vascular cryptogams at present known to occur in the State. The orders are arranged according to Bessey's "Botany," and the genera and species according to Underwood's "Our Native Ferns and their Allies," a most valuable work.* The list is considered quite complete, being much larger than has before been accredited to the State. The following named ferns, however, may quite confidently be expected to occur within our borders, and the attention of collectors is specially directed to their detection: *Cheilanthes vestita*, *Asplenium ebencum*, *A. Trichomanes*, *Phegopteris Dryopteris*, *Aspidium Novboracense*, *A. filix-mas*, *A. marginale*, *A. cristatum*, *A. cristatum*, var. *Clintonianum*.

The present list only covers, geographically, about one-half the State. If a nearly straight line be drawn from the northwest to the southeast corner, it will pretty accurately separate the eastern portion, the pteridophytic flora of which is quite well known, from the western portion, from which no specimens have yet been received. The northwestern part of the State consists almost wholly of treeless prairies, with few localities suitable to the growth of ferns and allied plants. What the rest of the western part of the State affords must be determined by future explorations. The State as a whole is not a favored one for such plants. They are most numerous, in both species and individuals, along the Mississippi River, and become fewer as we pass westward. The peculiarity of the flora is well indicated in the sparseness of lycopods and selaginellas, but one locality being known for the only species of *Lycopodium* yet reported, and only two localities with few individuals for the single *Selaginella*.

Much credit is due the several collectors for the trouble they have taken to obtain and forward specimens. Those communicating material for the present contribution are as follows: R. I. Cratty, of Armstrong, Emmet county; E. W. Holway, of Decorah; John Leiberg, late of Mankato, Minnesota; Prof. C. E. Bessey, of Ames; Prof. and

*To be obtained of the author, Prof. L. M. Underwood, Syracuse, N. Y.; price, \$1.25.

Mrs. T. H. McBride, of Iowa City; J. G. Haupt, of Durant, Cedar county; Mrs. M. C. Carter, of Hesper; Dr. George E. Ehinger, of Keokuk; Prof. J. E. Todd, of Tabor, Fremont county; Dr. J. J. Davis, of Racine, Wisconsin; George D. Butler, of Fort Jones, California; and O. G. Young, of Raymond, Blackhawk county. Acknowledgment should also be made to several well-known botanists for determination of specimens submitted to them. Special thanks are due Prof. Bessey for placing the herbarium and other facilities of the Iowa Agricultural College at the service of the writer. Some information was obtained from an illustrated and descriptive list of Iowa ferns represented in the Agricultural College herbarium, compiled by Miss Ida Twitchell, and published in the *Aurora* (the college paper) for October, 1880, under the title of "Filices Iowenses." Credit is also due Dr. George Engelmann, Mr. R. Hitchcock, and Mr. N. L. Britton, for assistance in tracing the history of our Marsilia.

The following plants, regarding which information has been furnished by Mr. David F. Day, of Buffalo, New York, and other collectors, are reported to be in the State, but are for the present withheld from the list, because no specimens have yet been received: *Cycloloma platyphyllum*, *Corispermum hyssopifolium*, *Petalostemon villosus*, *Actinomeris helianthoides*, *Mulgedium acuminatum*, *Verbena Aubletia*, *Carex filiformis*, and *Phegopteris polypodioides*.

The next contribution (No. VII.) will contain the mosses and liverworts. Not many specimens have yet been communicated, and in the region bordering the Mississippi River, where the most material is to be expected, there are, unfortunately, few local collectors. The present additions to the previously published lists are as follows:

PHANEROGAMIA.

- 204^a *Desmodium Dillenii*, Darl. Keokuk.
- 243^a *Potentilla Pennsylvanica*, L. Lyon county.
- 270^a *Hamamelis Virginica*, L. Dubuque.
- 288^a *Opuntia fragilis*, Haw. Lyon county.
- 459^a *Artemisia frigida*, Willd. Lyon county.
- 508^a *Chimaphila umbellata*, Nutt. Hesper.
- 509^a *Ilex verticillata*, Gray. Osage.
- 539^b *Veronica serpyllifolia*, L. Iowa City.
- 540^a *Veronica arvensis*, L. Hesper; Keokuk.
- 600^a *Lithospermum arvense*, L. Keokuk.
- 624^a *Solanum rostratum*, Dunal. Fremont county; Council Bluffs.

- 640^a *Asclepias speciosa*, Torr. Emmet county.
 683^a *Polygonum tenue*, Michx. Lyon county.
 761^a *Abies balsamea*, Marsh. Decorah.
 783^a *Potamogeton pusillus*, L. Emmet county.
 794^a *Spiranthes gracilis*, Bigel. Decorah.
 853^a *Eleocharis Wolfii*, Gray. Emmet county.
 854^a *Scirpus pungens*, Vahl. Ames.
 885^c *Carex Meadii*, Dew., var. *Bebbii* (Olney). Emmet county.
 893^c *Carex Pseudo-Cyperus*, L. Spirit Lake; Emmet county.
 927^b *Buchloe dactyloides*, Engelm. Lyon county.
 927^c *Graphephorum festucaceum*, Gray. Emmet county.
 950^b *Schedonnardus Texanus*, Steud. Lyon county.
 952^a *Agropyrum violaceum*, Vasey. Emmet county.

PTERIDOPHYTA.

ISOETACEÆ.

- 980 *Isoetes melanopoda*, J. Gay. Clinton.

SELAGINELLACEÆ.

- 981 *Selaginella rupestris*, Spring. Lyon county; Vinton.

LYCOPODIACEÆ.

- 982 *Lycopodium lucidulum*, Michx. Hesper.

RHIZOCARPEÆ.

- 983 *Marsilia vestita*, Hook. & Grev. "Near the Mississippi River."

OPHIOGLOSSACEÆ.

- 984 *Botrychium ternatum*, Swz. Charles City.
 985 *Botrychium Virginianum*, Swz. Common.

FILICES.

- 986 *Polypodium vulgare*, L. Boone county; Winnesheik county; Muscatine county.

- 987 *Adiantum pedatum*, L. Common.

- 988 *Pteris aquilina*, L. Common.

- 989 *Cheilanthes lanuginosa*, Nutt. Winnesheik county; Dubuque.

- 990 *Pellaea gracilis*, Hook. Winnesheik county; Iowa City; Charles City. Probably also at Davenport, as it is accredited to Iowa in Eaton's "Ferns of North America," on authority of Dr. Parry.

- 991 *Pellaea atropurpurea*, Lk. Mason City; Fort Dodge; Des Moines; and sparingly throughout the eastern half of the State.

- 992 *Asplenium angustifolium*, Michx. Delaware county.

- 993 *Asplenium thelypteroides*, Michx. Iowa City; Muscatine county.

994 *Asplenium filix-femina*, Bernh. Ames; Keokuk; Winnesheik county; Emmet county; Delaware county; Muscatine county; Iowa City; Charles City. The var. *Michauxii*, Mett., in Polk and Story counties.

995 *Camptosorus rhizophyllus*, Lk. Des Moines; Ackley; Fort Dodge; Delaware county; Iowa City; Decorah; Monticello; Muscatine county.

996 *Camptosorus rhizophyllus*, Lk., var. *intermedius*, Arthur. Muscatine county.

997 *Phegopteris hexagonoptera*, Fée. Delaware county; Muscatine county; Iowa City.

998 *Phegopteris calcarea*, Fée. Decorah.

999 *Aspidium acrostichoides*, Swz. Muscatine county.

1000 *Aspidium Thelypteris*, Swz. Winnesheik county; Scott county; Iowa City.

1001 *Aspidium Goldianum*, Hook. Muscatine county.

1002 *Aspidium spinulosum*, Swz. Keokuk; Muscatine county.

1003 *Cystopteris bulbifera*, Bernh. Charles City; Winnesheik county; Delaware county; Muscatine county; Iowa City.

1004 *Cystopteris fragilis*, Bernh. Very common, as also the var. *dentata*, Hook.

1005 *Onoclea sensibilis*, L. Not uncommon from Charles City, Ames, and Keokuk, eastward.

1006 *Onoclea Struthiopteris*, Hoffm. Throughout the eastern half of the State as far south as Iowa City; also in Emmet county.

1007 *Woodsia obtusa*, Torr. Johnson county; Delaware county; Winnesheik county; Boone county; Muscatine county.

1008 *Osmunda Claytoniana*, L. Charles City; Winnesheik county; Ames; Iowa City.

EQUISETACEÆ.

1009 *Equisetum arvense*, L. Very common.

1010 *Equisetum limosum*, L. Story county; Scott county; Emmet county.

1011 *Equisetum robustum*, A. Br. Keokuk; Clinton county.

1012 *Equisetum hiemale*, L. Common.

1013 *Equisetum levigatum*, A. Br. Emmet county.

The following descriptions are of species not given in Gray's "Manual," 5th edition, nor in Underwood's "Our Native Ferns and their Allies:—"

OPUNTIA FRAGILIS, *Haworth*.—Joints small, ovate, compressed or tumid, or even terete, 1-1½ inches long, fragile; larger spines 4, cruciate, mostly yellowish brown, with 4 to 6 smaller white radiating ones below; bristles few; flowers small, yellow; fruit small, with 20 to 28 clusters of bristles, only the upper ones with a few short spines; seeds few, regular.—On the Upper Missouri and Yellowstone, southward to New Mexico. *Watson in King's Rep.*, *V.*, 119.

SOLANUM ROSTRATUM, *Dunal*.—Somewhat hoary or yellowish, with a copious, wholly stellate pubescence, a foot or two high; leaves irregularly or interruptedly bipinnatifid, some of them only once pinnatifid; corolla yellow, about an inch in diameter, hardly regular, the short lobes broadly ovate.—Plains of Nebraska to Texas. *Gray's Syn. Fl. N. Am.*, *II.*, 231.

This has been observed by Prof. Todd in the southwestern county of the State, and by Mr. David F. Day at Omaha, fifty miles from the southern boundary. According to Prof. Todd, it occurs sparingly in gardens and about barns, and is apparently not well established. He is inclined to consider it adventitious, and it is accordingly so printed.

ASCLEPIAS SPECIOSA, *Torrey*.—Finely canescent-tomentose, rarely glabrate with age; leaves from subcordate-oval to oblong, thickish; peduncles shorter than the leaves; pedicels of the many-flowered dense umbel and the calyx densely tomentose; flowers purplish, large; corolla-lobes ovate-oblong, 4 or 5 lines long; hoods 5 or 6 lines long, spreading, the dilated body and the short inflexed horn not surpassing the anthers, but the center of its truncate summit abruptly produced into a lanceolate-ligulate thrice longer termination; column, hardly any; wings of the anthers notched and obscurely corniculate at base.—Along streams, Nebraska to Arkansas, and west to Southern Utah, California, and Washington Territory. *Gray's Syn. Fl. N. Am.*, *II.*, 91.

The locality cited in the list extends the range of this species more than two hundred miles farther northward than has before been recorded east of the Rocky Mountains. It is one of the most conspicuous and beautiful of American milk-weeds.

ELEOCHARIS WOLFFI, *Gray*.—Rhizomes very small, creeping, perennial, forming small scattered tufts; culm a foot high, slender, pale-glaucescent, striate, two-edged, one side flat, the other convex; sheath obliquely truncate, hyaline above; spike ovate-oblong, acute; scales oblong-ovate, obtuse, scarious, pale purple; style 3-parted; achenium pyriform, shining, having about 9 nearly equidistant obtuse ribs, with transverse wrinkles between; tubercle small, depressed, truncate, more or less apiculate; bristles of the perigynium [always?] none.—Margin of ponds, in very wet soil, Fulton county, Illinois, John Wolf. Probably it will prove to be not uncommon. I have specimens collected in the same region, doubtless at Athens, Illinois, in the year 1861, by Elihu Hall. Prof. Wolf, in a letter, alluded to six bristles of the perigynium, but I detect none whatever in the specimens. The spike, as to form and imbrication of the scales, is much as in *E. tenuis* and *E. acicularis*, etc.; but the achenium, with its several longitudinal ribs and delicate transverse

lineation, is upon the plan of that of *E. acicularis*. This renders the species a very peculiar and distinct one. *Proc. Amer. Acad.*, X., 77.

The species occurs sparingly at Peoria, Illinois, according to Brendel's *Flora Peoriana*, p. 85. The Iowa specimens, which agree well with the description, apparently possess no perigynial bristles.

CAREX MEADII, *Detw.*, var. *BEBBI* (*Olney*).—This was published in Olney's *Carices Bor.-Amer.*, Fasc. I., No. 22, without comments, as a variety of *C. panicea*, L., and has never, I believe, been described. The following description will enable collectors to identify the plant:

Sterile spikes with stalk two to four times its length; fertile spikes usually 2, erect, remote, slender-peduncled, rather loosely flowered; sheaths of the foliaceous bracts long and slightly inflated; perigynia and scales as in *C. Meadii*, except paler, and the former less distinctly nerved; culms slender, somewhat roughish.

Resembles *C. tetanica*, for which it is sometimes mistaken, in habit and in the loosely flowered fertile spikes, only with longer peduncles, but *C. Meadii* in the perigynia and scales; it may be merely an attenuated form of the latter. Moist prairies, Winnebago county, Illinois (*Bebb*); Chicago (*Babcock*); Racine, Wisconsin (*Davis*); and northwestwardly. Collected in Iowa by Mr. Cratty.

BUCHLOE, *Engelm.*—Flowers diceious, heteromorphous. *Male plant*: Spikes 1-sided, 2-ranked; spikelets 2 to 3-flowered; glumes 1-nerved; squamule in pairs. *Female plant*: Spikes 1 to 3, oblique in the involucrate sheaths of the upper leaves; spikelets 1-flowered, crowded; lower glume of the lowest spikelet 1 to 3-nerved, the lower side adnate to the back of the upper glume; lower glumes of the other spikelets (internal as to the head) 1-nerved, free, smaller; upper glumes (external) nerveless, connate at the base with the thickened rhachis, at length like a hard, woody involucre; squamule as in male flowers; ovary lenticular, glabrous; stigmas much longer than the two erect styles.

B. DACTYLOIDES, *Engelm.*—Densely tufted, spreading by stolens, forming broad mats; culms 3 to 6 inches long. *Male plant*: Flowering stems 4 to 6 inches high; leaves nearly smooth; sheaths strongly bearded at the throat; uppermost spikelets abortive, bristle-form; lower glume ovate-lanceolate, with a scarios margin; upper glume twice longer, ovate; lower palea convex, 3-nerved, upper one 2-nerved; stamens 3. *Female plant*: Flowering stems much shorter than the leaves, 1½ to 2 inches high; 3 minute rudimentary stamens; grain free.—Elevated plains from British America to Mexico and New Mexico. *Flor. Col., Port. & Coul.*, 147.

This is the well-known buffalo-grass. It grows sparingly in the north-west corner of the State, on thin, dry soil covering the rocks, where other plants have much difficulty in maintaining themselves.

GRAPHEPHORUM FESTUCACEUM, *Gray*.—Panicle loose, rather erect, primary branches subverticillate; spikelets oblong, about 4-flowered; glumes nearly or quite as long as the spikelets; florets terete, with clustered hairs at the base; outer palea

7-nerved, irregularly cut at the apex, forming short awns, inner palea bidentate; leaves broadly linear, flat, rough to the touch.—Carlton House Fort, on the Saskatchewan. This fine grass is considered by Dr. Torrey to be the same as the *Festuca borealis*, M. & K. The culm in our specimen is as thick as a swan's quill, 3-4 or more feet high; leaves 8-10 inches long, broadly linear-acuminate, rough to the touch. Panicle a foot and more long, almost quite erect, as well as the subverticillate slender branches. Spikelet erect, $\frac{1}{2}$ - $\frac{3}{4}$ of an inch long, scattered or subfascicled, sessile or pedicellate, generally 4-flowered. Glumes unequal, concave, rounded at the back, not keeled, the outer one shorter than the florets, acute, entire at the point, the middle nerve reaching beyond the point so as to form a short arista, there are besides, on each side, two short lateral nerves; the inner glume as long as the whole spikelet of florets, torn at the point, aristate, the middle nerve reaching beyond the point, there are besides two lateral nerves reaching to the apex, and two intermediate shorter ones. Florets cylindrical, closely placed, with a tuft of white hairs at the base of each; outer valve of the perianth jagged at the point, shortly aristate, with 7 nerves reaching to the summit; the inner lanceolate, the margin inflexed, with two strong, green, ciliated nerves at the flexures, running out so as to form a bifid apex. *Hook. Flor. Bor. Am.*

Hooker gives the above under *Festuca borealis*, M. & K. The species was first described by Willdenow and referred to *Arundo*. In 1861, Dr. Gray revised and considerably extended the genus *Graphophorum* (Proc. Am. Acad., V.), placing the present species in the first section. The Iowa specimens, communicated by Mr. R. I. Cratty, agree fully with the description, except that the spikelets are not so large, scarcely exceeding $\frac{3}{8}$ of an inch in length. Pedicels of the spikelets rough; awns formed by the nerves, especially of the glumes, inconspicuous, and sometimes barely observable. It grows 3-5 feet high in water, at the margin of lakes. The spot where found, some five or six square rods, had an abundance of individuals, and it doubtless occurs at other lakes in Iowa and Minnesota. The range given in Vasey's "Grasses of the United States" is from British America to Alaska. It is now for the first time detected in the United States.

CAMPTOSORUS RHIZOPHYLLUS, Link, var. *INTERMEDIUS*, Arthur. — Root-stalk short, ascending, clothed with a few dark-brown scales; stipe green, with a brown base, containing a single rounded-triangular fibro-vascular bundle without accompanying sclerenchyma; fronds subcoriaceous, thinnish; sterile frond 2-4 inches long, triangular-acuminate, sometimes prolonged and rooting, base broadly wedge-shape, apex blunt; fertile frond 4-12 inches long, narrowly lanceolate, broadest close to the base, greatly attenuated and prolonged, rooting at the apex; base acute, broadly wedge-shape, never cordate; veins strongly ascending, anastomosing and forming about two series of areolae; sori few, oblong, sometimes in pairs, or confluent at the upper part of the areolae; indusium smooth, delicate, with a sinuous margin; spores ovoid, with broad anastomosing wings of irregular width.—Sterile blade

$\frac{1}{4}$ – $\frac{1}{2}$ inch broad near the base, fertile blade $\frac{1}{4}$ – $\frac{3}{4}$ inch broad. Limestone cliffs in Eastern Iowa. *Bot. Gaz.*, VIII., 199, Plate III.

Resembles *C. rhizophyllus*, but may be readily distinguished by the solitary axial bundle of the stipe, destitute of the extra-fascicular sclerenchyma, the thinner and narrower fronds, acute base, simpler venation, and short sori. The typical form has two distinct bundles at the base of the stipe, which coalesce above into one; these are accompanied by a dark thread of sclerenchyma situated outside each bundle, and usually anterior to it, which unite to form a single thread after the union of the bundles, or, when lateral, remain as distinct lateral threads. In the variety the bundle is simple throughout, and has no external sclerenchyma. Again, in the typical form the base of the frond is never strictly wedge-shape, as in the variety, but, however much reduced, has still some indication of auricles. It is the opinion of Mr. George E. Davenport (in litt.) that this "is only a weakly growth, in which the plants have simply failed to develop their full characters," a conclusion which some of the facts do not appear to corroborate. The small area covered by the plants was within a few yards of as large and thrifty a growth of the typical walking-leaf as one is likely to find. Small plants have been gathered by the writer and others in various parts of the State, but none of them show the distinctive characters of the variety. A specimen in the herbarium of the Chicago Academy of Sciences, collected by A. H. Curtiss in Virginia, more nearly approaches the variety in external appearance than any other yet seen by the writer; the fibro-vascular bundle, however, is in every respect typical. If this be only an individual form, it is still interesting, as all the deviations from the type are in the direction of the Sibirian species, *C. Sibiricus*, the only other species known. The walking-leaf is not a rare fern in Iowa, and the discovery of the variety in other localities may confidently be expected.

CORRECTIONS AND EXPLANATIONS.

The following are corrections of previous contributions and some additional notes on the present one:

In Contr. No. V., for *Emmett Co.*, read Emmet Co.

Aphyllon fasciculatum (No. 523) is to be dropped from the catalogue. Upon re-examination, the specimens prove to be the same as No. 522^a of Contr. No. II. It (*A. uniflorum*, T. & G.) is a very rare plant in the State.

Polygonum tenue, Michx. (No. 683^a), has a number of times been reported with specimens from various parts of the State, but has always heretofore proved to be a small form of the abundant *P. ramosissimum*. The true *P. tenue* is, without doubt, a rare plant in Iowa. The region from which the present specimens come, the extreme northwestern corner, is geologically and botanically very unlike the rest of the State.

Potamogeton pusillus, L. (No. 783^a), is said by Mr. Morong to be the typical form, but what has generally been called *var. vulgaris*.

Schedonnardus Texanus, Steud. (No. 950^b) is described in Gray's Manual under the name of *Lepturus paniculatus*, Nutt. See North American Genera of Grasses, by F. L. Scribner, in Bull. Torr. Cl., IX., 134, and X., 8; also, Grasses of United States, by George Vasey, 1883, p. 32.

Agropyrum violaceum, Vasey (No. 952^a), is described in Gray's Manual under the name of *Triticum violaceum*, Horn. See Vasey's Grasses of the United States, 1883, p. 45.

Isoetes melanopoda, J. Gay (No. 980), was collected near Clinton by Dr. George Vasey in 1862, and specimens are now in his herbarium in Illinois. They were determined by Dr. Engelmann. No other specimens are known to have been collected in the State. The plants, being grass-like in appearance, are doubtless overlooked. The Iowa specimen is cited in Engelmann's *Isoetes of North America*, p. 3.

Marsilia vestita, Hook. & Grev. (No. 983), is given solely on the authority of Wood's Class-book of Botany (editions of 1860 and 1869), p. 810, which says that it was "sent from Iowa, near the Mississippi River, by Dr. Cousens." Probably no other specimens than those referred to have been collected in the State. The citation of Iowa under *M. vestita* in Underwood's *Our Native Ferns and their Allies*, p. 115, is on the same authority, as I am informed by the author. In Wood's *Botanist and Florist* (1870), p. 360, a later publication than the Class-book, we find that Iowa is credited with *M. uncinata*, Br., with no reference to *M. vestita* of the Class-book, or to Dr. Cousens' specimens. Inquiry at the College of Pharmacy, in New York City, where Prof. Wood's herbarium is now deposited, discloses the unfortunate fact that many of the specimens were considered worthless, when the herbarium recently came to be mounted, and were destroyed, and that as the specimens in question cannot be found, they were doubtless among the discarded ones. We have therefore no direct way of determining with

certainly what form of *Marsilia* was really collected, or in what locality it was found. A review of the few instances in which specimens of *Marsilia* have been collected in this region will, however, afford some slight assistance. A *Marsilia* appears to be comparatively abundant in Dakota. It was first found in 1839 by Geyer, of Nicollet's Expedition, in "dry swamps in the prairies near Devil's Lake," Northern Dakota. Torrey, in the report of this expedition, p. 166, determined it to be *M. vestita*, and specimens are in both the Torrey and Chapman herbaria at Columbia College, New York City. A. Braun, however, referred it to *M. mucronata* in an account in *Monatsberichte der Akademie*, Berlin, 1863, p. 423, and adhered to the same opinion in a fuller account in the same publication of 1870. Sterile specimens of what may be the same species were gathered by Mr. J. M. Holzinger in July, 1883, near Pierre, in Central Dakota, in a ditch by the railway track on the prairie. The specimens are now in my possession. Michaux collected a sterile specimen in Illinois, still in the Michaux herbarium, which A. Braun doubtfully refers to *M. mucronata* (l. c., 1870), but it has not been detected since. These are all the specimens known to the writer to have been collected nearer us than Arkansas. We may conclude that there is little doubt that either *M. vestita* or *M. mucronata*, or it may be both, will finally be found in Iowa. The two are much alike, and Braun seems to have arrived at the opinion that they can scarcely be specifically distinct, a conclusion adopted by Watson in the *Botany of California*, p. 351, where the latter is made a form of *M. vestita*. *Marsilia* has slender, creeping stems, leaves closely resembling those of white clover, but with four leaflets instead of three, fruit the shape of a bean, and nearly half the size of one, and commonly grows in shallow water or mud. As with *Isoetes*, so with *Marsilia*, it has probably been overlooked; and the main reason for inserting *M. vestita* in the present list without accompanying specimens, which is contrary to the established rule, is to bring the matter to the attention of local collectors.

Botrychium ternatum, Swartz (No. 984), was found by the writer in August of 1881. Only a single plant was discovered, which grew in an open pasture. The specimen was unfortunately dropped and lost before reaching home. Judging from memory of the hasty examination made when in hand, it belonged to sub-variety *intermedium* of Eaton. The plant was nearly a foot high, and had a close resemblance to the figure given in Eaton's *Ferns of North America*, Vol. I., Pl. XXa, of a specimen of this variety from Shelbourne, N. H. It is undoubtedly rare in Iowa. The only other instance of its having been found in the

State is that recorded by Miss Mary E. Wood (*Bot. Gaz.*, VII., 73), who reports it from the Maquoketa River, about fifty miles west of Dubuque, but I have seen no specimens.

Phegopteris calcarea, Fée (No. 998), is "closely related to *P. Dryopteris*, the principal differences being a somewhat thicker root-stalk, glandular stalk and fronds, fronds more rigid and erect, and smaller pinnae on the lower side of the primary divisions" (Eaton). It is not uncommon in Europe, but the only localities known in North America are a station on the St. Louis River, in Minnesota, and a spot of a few yards square at Decorah. The Decorah specimens are specially fine and well developed. It is to be looked for on limestone cliffs, particularly those facing the north. Mr. Davenport, in his Supplement to the Catalogue of the Dav. Herbarium (March, 1883), writes the name *P. Dryopteris*, Fée, var. *Robertianum* (Rupr.), and gives the history of the synonymy, maintaining that it is not entitled to specific rank.

Aspidium spinulosum, Swartz (No. 1002), in the comparative size of the pinnules and the markings of the spores in the Iowa specimens, approaches var. *dilatatum*, which variety will doubtless be found eventually within the limits of the State.

Cystopteris bulbifera, Bernh. (No. 1003), shows an interesting variation in a specimen received from Muscatine county. The under surface of the frond is unevenly glandular, and the usually smooth bulblets are clothed with dark brown lanceolate scales (paleæ), half as long as the length of the bulblets, each scale tipped with a colorless, globular, usually stalked gland, and with or without 1 to 3 similar glands on either side, near the base.

SPIRIT LAKE, IOWA, December, 1883.



Contributions to the Flora of Iowa.

BY J. C. ARTHUR.

The following list comprises all the species of Iowa plants brought to my notice up to date, and not mentioned in my "Flora of Iowa." Specimens of each from which the names were determined, are either in my private herbarium, or in the herbarium of the Agricultural College, and were all furnished by Dr. Geo. E. Ehinger of Keokuk, J. G. Haupt of Davenport, Prof. C. E. Bessey of Ames, and R. Burgess of Ames.

- 76^a *Draba verna*, L. Ames.
 97^a *Hypericum prolificum*, L. Keokuk.
 110^a *Lychnis respertina*, Sibth. Decorah.
 207^a *Lespedeza violacea*, Pers. Keokuk and Davenport.
 236^a *Agrimonia parviflora*, Ait. Keokuk.
 353^a *Eupatorium altissimum*, L. Harrison County.
 362^a *Aster Shortii*, Boott. Keokuk.
 365^a *Aster ericoides*, L. Keokuk.
 369^a *Aster tenuifolius*, L. Plymouth County.
 468^a *Senecio aureus*, L. Var. *obovatus*, Gr. Ames.
 422^a *Aphyllon uniflorum*, T. & G. Keokuk.
 427^a *Collinsia verna*, Nutt. Keokuk.
 533^a *Conoclea multifida*, Benth. Keokuk.
 539^a *Veronica Americana*, Schw. Keokuk.
 579^a *Monarda punctata*, L. Cedar Rapids.
 638^a *Apocynum cannabinum*, L. Var. *pubescens*, DC. Blackhawk Co.
 644^a *Asclepias quadrifolia*, Jacq. Keokuk.
 670^a *Fraelichia Floridana*, Moq. Cedar Rapids.
 751^a *Salix sericea*, Marshall. Plymouth County.
 754^a *Salix lucida*, Muhl. Plymouth County.
 811^a *Trillium erectum*, L. Decorah.
 843^a *Cyperus inflexus*, Muhl. Ames.
 934^a *Glyceria fluitans*, R. Br. Ames.

Lespedeza capitata, var. *angustifolia* of the "Flora of Iowa", (No. 209), should be changed to *L. leptostachya*, Engelm. The following description of this new species is from Proceedings American Academy of Arts and Sciences, Vol. XII (Dec. 1876): "*Lespedeza leptostachya*, Engelm. —Clothed with appressed, silky pubescence; leaves linear; petiole longer than the terminal petiole; spikes paniculate, slender, somewhat loosely flowered, rather longer than the peduncle; legume equal to or slightly longer than the calyx. Minnesota, T. J. Hale; Illinois, Bebb.; Iowa, J. C. Arthur, Bessey. Has passed for *L. angustifolia*, from which its slender spikes and paniculate habit at once distinguish it."

Many names have been reported from different parts of the State, but not being accompanied by specimens, it is thought best not to include them in this list. Additions will be made as often as sufficient material accumulates.



AUGUST 2D, 1878.—BIOLOGICAL SECTION.

Four members present.

The following paper was read :

Contributions to the Flora of Iowa---No. III.

BY J. C. ARTHUR.

The following accessions have been received since the publication in March, 1877, of my first list of additions.* They have been verified by the examination of specimens sent by those reporting the names. I am indebted for all but ten names to Geo. D. Butler, of Almont, Clinton County, Dr. Geo. E. Ehinger, of Keokuk, R. Burgess, of Ames, E. W. Holway, of Decorah, Dr. J. J. Davis, late of Vinton, and Prof. C. E. Bessey, of Ames. I desire to gratefully acknowledge their kind consideration in furnishing specimens, and the interest they have taken in extending the list of the State flora.

*Ante, p. 126.

- 42^a *Brasenia peltata*, Pursh. Ames.
 52^a *Nasturtium sessiliflorum*, Nutt. Clinton.
 55^a *Nasturtium lacustre*, Gray. Clinton.
 62^a *Arabis hirsuta*, Scop. Clinton.
 66^a *Barbarea vulgaris*, R. Br. Ames.
 97^b *Hypericum sphaerocarpon*, Michx. Vinton and Clinton.
 101^a *Hypericum Canadense*, L., var. *major*, Gr. Vinton, Lyons and Ames.
 112^a *Arenaria stricta*, Michx. Clinton.
 154^a *Vitis aestivalis*, Michx. Clinton.
 177^a *Trifolium reflexum*, L. Vinton and Clinton county.
 196^a *Astragalus Plattensis*, Nutt. Harrison county.
 206^a *Desmodium Illinoense*, Gray. Ames.
 235^a *Spiraea Aruncus*, L. Clinton.
 237^a *Geum Virginianum*, L. Vinton.
 244^a *Potentilla fruticosa*, L. Decorah.
 250^a *Rubus Canadensis*, L. Clinton.
 285^a *Ludwigia palustris*, Ell. Vinton.
 285^b *Ammannia humilis*, Michx. Vinton.
 285^c *Ammannia latifolia*, L. Ames.
 314^a *Cornus circinata*, L'Her. Ames and Vinton.
 364^a *Aster sagittifolius*, Willd. Plymouth county.
 366^a *Aster dumosus*, L. Vinton.
 372^a *Aster puniceus*, L., var. *rimineus*, Gr. Ames.
 374^a *Aster umethystinus*, Nutt. Charles City and Ames.
 428^a *Helianthus occidentalis*, Riddell. Vinton and Clinton.
 435^a *Coreopsis lanceolata*, L. Clinton.
 438^a *Coreopsis aristosa*, Michx., var. *mutica*, Gr. Vinton.
 471^a *Cnicus lanceolatus*, Hoffm. Clinton.
 495^a *Sonchus oleraceus*, L. Cedar Rapids.
 512^a *Plantago Patagonica*, Jacq., var. *gnaphalioides*, Gr. Humboldt.
 525^a *Linaria Canadensis*, Spreng. Cedar Rapids and Vinton.
 59^{1a} *Scutellaria parvula*, Michx., var. *mollis*, Gr. Iowa City.
 6^{6a} *Myosotis verna*, Nutt. Vinton.
 607^a *Echinosperrum deflexum*, Lehm. Clinton.
 615^a *Phlox divaricata*, L. Lyons.
 616^a *Phlox bijida*, Beck. Vinton.
 619^a *Cuscuta tenuiflora*, Engelm. Vinton and Keokuk.
 625^a *Physalis pubescens*, L. Ames.
 696^a *Ceratophyllum demersum*, L. Keokuk.
 697^a *Euphorbia Geyeri*, Engelm. Vinton.
 708^a *Euphorbia obtusata*, Pursh. Ft. Dodge.
 777^a *Potamogeton natans*, L. Ft. Dodge.
 782^a *Potamogeton compressus*, L. Vinton.
 787^a *Sagittaria heterophylla*, Pursh. Clinton.
 818^a *Utricularia sessilifolia*, L. Vinton.
 850^a *Hemicarpha subsquarrosa*, Nees. Ames.
 855^a *Scirpus fluviatilis*, Gray. Ames and Clinton.

- 856^a *Scirpus lineatus*, Michx. Ames.
 862^a *Carex crus-corvi*, Shult. Clinton.
 863^a *Carex conjuncta*, Boott. Ames.
 863^b *Carex alopecoidea*, Tuckerm. Ames.
 879^a *Carex straminea*, Schk., var. *tenera*, Boott. Charles City, Keokuk, Ames.
 885^a *Carex tetanica*, Schk. Ames.
 890^a *Carex oligocarpa*, Schk. Ames and Keokuk.
 891^a *Carex pedunculata*, Muhl. Clinton.
 893^a *Carex trichocarpa*, Muhl., var. *imberbis*, Gr. Ames.
 895^a *Carex Grayii*, Carey. Ames.
 897^a *Carex squarrosa*, L. Keokuk.
 901^a *Alopecurus geniculatus*, L. Vinton, Ames and Lyons.
 931^a *Eatonia Pennsylvanica*, Gray. Ames.
 942^a *Eragrostis pectinacea*, Gray. Vinton.
 943^a *Festuca elatior*, L. Ames.
 950^a *Lolium perenne*, L. Ames.
 953^a *Hordeum pratense*, Huds. Keokuk.
 972^a *Panicum depauperatum*, Muhl. Vinton.

The following descriptions are of plants named in this list, and not described in Gray's Manual. The range of the species, as given, is that hitherto known and published with the respective descriptions. It will be observed that in each instance it is considerably extended by the localities given above.

DESMODIUM ILLINOENSE, Gray.—Resembling *D. canescens* in flowers and foliage, and *D. rigidum* in inflorescence and fruit; stem (erect, 3-5 feet) and leaves with short rough pubescence; leaflets (2-4 inches long) ovate-oblong or ovate-lanceolate, obtuse, sub-coriaceous, beneath cinereous, veins and veinlets prominent, strongly reticulated, the lower leaflets nearly equaling the petiole; the persistent stipules and caducous bracts ovate-lanceolate, striate, taper-pointed; racemes simple; pods scarcely over an inch, very shortly stipitate, sinuate on both margins (deeper below); joints 3-5, oval, not exceeding three lines.—Illinois, in dry ground. *Proc. Amer. Acad.*, 1870.

SCUTELLARIA PARVULA, Michx., var. *MOLLIS*, Gray.—Rather more diffuse, softly pubescent throughout, pubescence somewhat viscid; leaves usually three-fourths of an inch long—Oquawka, Illinois, on the sandy banks of the Mississippi. *Proc. Amer. Acad.*, VIII, 1873. Dr Gray says: "So different in aspect is this plant from the ordinary *S. parvula*, that I at first took it for *S. Drummondii*, and then for a distinct species; but I cannot detect sufficient characters, and there are transitions to the ordinary *S. parvula*."

ECHINOSPERMUM DEFLEXUM, Lehm.—Diffusely branched, a foot or so high; leaves from oblong to lanceolate; racemes lax, loosely paniculate, the slender pedicels recurved or deflexed in fruit; flowers soon sparse, 1-3 lines in diameter; nutlets with a triangular mostly naked back (a line long), the margins armed with a close row of flat prickles, their bases often confluent.—Saskatchewan and Winnipeg Valley, *Drummond, Bourgeau*; Brit. Columbia, *Lyall*. Siberia to Europe. The American specimens have occasionally some few prickles developed from the rough granulate dorsal face of the nutlets. *Gray's Synop. Fl. N. Amer.*, 1878.

CORRECTIONS.

Amarantus Blitum (No. 668), of "Flora of Iowa," is *A. blitoides*,

Watson. The following description is from *Proc. Amer. Acad.*, XII, 1877.

AMARANTUS (PYXIDIUM) BLITOIDES, *Watson*.—Prostrate or decumbent, the slender stems becoming a foot or two long, glabrous or nearly so; leaves broadly spatulate to narrowly oblanceolate, attenuate to a slender petiole, an inch long or usually less; flowers in small contracted axillary spikelets; bracts nearly a line broad.—Frequent in the valleys and plains of the interior, from Mexico to N. Nevada and Iowa, and becoming introduced in some of the Northern States eastward. It somewhat resembles the *A. Blitum*, L., of the Old World, and has been mistaken for it.

Aster Novi-Belgii (No. 371) is to be omitted from the list. The specimens on which the determination was made, prove to belong to a much commoner species.

A few very interesting names are withheld for further verification. Collectors will confer a favor if they will forward information in regard to the State flora. It is proposed to publish additions as fast as consistent with accuracy.

Botanical Laboratory, Agricultural College, Ames, Iowa: August, 1877. J. S.

Contributions to the Flora of Iowa--No. IV.

BY J. C. ARTHUR.

The activity of resident collectors in extending the state flora has greatly increased since 1876. The quality of the specimens sent has also improved, as well as the liberality with which they are provided for determination or verification.

It will be seen by the localities in the following list, that the different portions of the state are quite fairly represented, except the three southern tiers of counties west of the immediate vicinity of the Mississippi. This large section when explored, will give a long list of additions. All the western border of the state may be expected to yield many very interesting species which do not extend further east; while no locality in the whole state yet seems to be exhausted.

The names of the present list are for the preceding two years. The specimens for them have been furnished by the following persons, to whom I am wholly indebted for the material for the present report: John Leiberg, Seney, Plymouth Co., M. E. Jones, Grinnell, Mrs. M. C. Carter, Hesper, Winneshiek Co., E. W. Holway, Decorah, Geo. D. Butler, late of Almont, Clinton Co., Fred. Reppert, Muscatine, Dr. Geo. E. Ehinger, Keokuk, R. Burgess, Ames, Dr. J. J. Davis, formerly of Vinton. A specimen of No. 544^a is in the Harvard Herbarium at Cambridge, communicated by Dr. Vasey.

- 51^a *Nasturtium officinale*, R. Br. Decorah.
- 65^a *Arabis perfoliata*, Lam. Vinton.
- 84^a *Viola lanceolata*, L. Muscatine.
- 90^a *Viola pedata*, L., var. *bicolor*, Pursh. Muscatine.
- 124^a *Talinum teretifolium*, Pursh. Lyons Co.
- 237^b *Geum macrophyllum*, Willd. Clinton Co.
- 244^b *Potentilla tridentata*, Ait. Hesper.
- 247^a *Rubus triflorus*, Rich. Hesper.
- 299^a *Archemora rigida*, DC., var. *ambigua*, T. & G. Kellogg and Vinton.
- 302^a *Thaspium aureum*, Nutt., var. *apterum*, Gr. Grinnell.
- 306^a *Berula angustifolia*, Koch. Sioux Co.
- 338^a *Galium circeazans*, Michx. Keokuk.
- 404^a *Silphium trifoliatum*, L. Clinton Co.

- 457^a *Actonisia serrata*, Nutt. Mason City and Grinnell.
- 469^a *Senecio lugens*, Rich., var. *Hookeri*, Eaton. Plymouth Co.
- 493^a *Mulgedium pulchellum*, Nutt. Ames and Grinnell.
- 511^a *Plantago Rugelii*, Dec. Ames and Grinnell.
- 519^a *Anagallis arvensis*, L. Keokuk.
- 520^a *Utricularia biflora*, Lam. Muscatine.
- 544^a *Gerardia tenuifolia*, Vahl., var. *macrophylla*, Benth. Council Bluffs.
- 545^a *Gerardia flava*, L. Clinton Co.
- 596^a *Lamium amplexicaule*, L. Keokuk.
- 619^b *Cuscuta inflata*, Engelm. Grinnell.
- 620^a *Cuscuta Gronovii*, Willd., var. *latiflora*, Engelm. Hesper.
- 628^a *Datura Tatula*, L. Muscatine, Grinnell and Cedar Rapids.
- 650^a *Acerates lanuginosa*, Dec. Plymouth Co.
- 662^a *Chenopodium urbicum*, L. Keokuk, Des Moines, Nevada, and Grinnell.
- 676^a *Polygonum hydropiperoides*, Mx. Grinnell, Plymouth Co.
- 678^a *Polygonum Muhlenbergii*, Watson. Plymouth County and Muscatine.
- 792^a *Habenaria hyperborea*, R. Br. Hesper.
- 792^b *Habenaria Hookeri*, Torr. Hesper.
- 796^a *Microstylis ophioglossoides*, Nutt. Decorah and Hesper.
- 817^a *Veratrum Woodii*, Robbins. Burlington.
- 826^a *Erythronium Americanum*, Smith. Hesper.
- 829^a *Allium cernuum*, Roth. Plymouth Co. and Decorah.
- 835^a *Juncus Fascyi*, Engelm. Clinton Co.
- 841^a *Coma hypn. Virginica*, L. Muscatine.
- 843^b *Cyperus acuminatus*, Torr. Plymouth Co.
- 850^b *Eleocharis obtusa*, Schultes. Keokuk, Kellogg, Clinton Co. and Plymouth Co.
- 858^a *Fimbristylis capillaris*, Gr. Keokuk.
- 861^a *Carex tortuoscula*, Good. Grinnell.
- 885^b *Carex granularis*, Muhl. Clinton Co.
- 892^a *Carex Richardsonii*, R. Br. Grinnell and Plymouth Co.
- 893^b *Carex trichocarpa*, Mx. Grinnell.
- 893^c *Carex riparia*, Curtis. Grinnell.
- 903^a *Vilfa aspera*, Beauv. Ames.
- 924^a *Aristida purpurea*, Nutt. Plymouth Co.
- 925^a *Bouteloua oligostachya*, Torr. Plymouth Co.
- 927^a *Eleusine Indica*, Gart. Keokuk.

The following descriptions are of plants in this list not described in Gray's Manual, 5th edition.

ARTEMISIA SERRATA, Nutt.—Stem tall and herbaceous; leaves lanceolate, acuminate at either extremity, margin serrate, upper side smooth, under tomentose and white; flowers paniculate, partly glomerate, erect; calyx small cylindric-ovate, and nearly smooth.—Near the Prairie du Chien, on the banks of the Mississippi, also on the banks of the Missouri, in open alluvial soils. Stem 5-6 feet high. *Nuttall's Genera*, II, 142.

SENECIO LUGENS, Richards.—Perennial, white-tomentose, deciduously lanate or nearly smooth; stem $1\frac{1}{2}$ -2 feet high, often several from one root; leaves obscurely veined, 2-8 inches long, $1\frac{1}{2}$ -2 inches wide, the radical obtuse, narrowed into a petiole, cauline sessile and partly clasping; heads variable in size, usually rather large; involucre with a few bractlets at the base; scales linear-lanceolate, acute, with blackish-purple tips; rays 10-12, oblong-linear, twice as long as the involucre; achenia glabrous.

Var. *HOOKERI*, Eaton.—Deciduously tomentose or smooth; stem simple; leaves entire or glandular-toothed, the radical oblong-spatulate, cauline lanceolate, acute, clasping; corymb dense; scales of the involucre conspicuously sphacelate. *Flor. Cal., Port. & Col.*

PLANTAGO RUGELII, Decaisne.—Leaves paler than in *P. major*, commonly thinner; spikes long and thin, attenuate at the apex; sepals oblong, all as well as the similar bracts acutely carinate; capsules erect in the spike, cylindraceous-oblong (somewhat over 2 lines long, one-sixteenth inch in diameter), about twice the length of the calyx, circumscissile much below the middle; ovules 6-10; seeds 4-9, oval-oblong (about a line long), opaque and dull brown, not reticulated.—*P. Kamtschatica*, Hook. Gray's Manual, ed. 5, not of Cham. Canada to Illinois and south to Georgia and Texas; probably truly indigenous, as no trace of it is found in the Old World. *Gray's Synop. Fl. N. Amer.*

GERARDIA TENUCIFOLIA, Vahl, var. *MACROPHYLLA*, Benth.—Stouter; leaves larger, $1\frac{1}{2}$ -2 inches long and almost 2 lines wide, scabrous; pedicels ascending; calyx-teeth usually larger; corolla little over $\frac{1}{2}$ inch long. Western Iowa to Colorado and W. Louisiana. *Gray's Synop. Fl. N. Am.*

CUSCUTA GRONOVII, Willd., var. *LATIFLORA*, Engelm.—A form with flowers of more delicate texture, and shorter tube and longer lobes to the corolla.—*C. Saurari*, Engelm. in Am. Jour. Sci., vol. 43, with 5 figures. Common northward. *Gray's Syn. Fl. N. Am.*

POLYGONUM MUEHLENBERGII, Watson.—Perennial, in muddy or dry places, often 2-3 feet high, scabrous with short appressed or glandular hairs, especially upon the leaves and upper stems; leaves thin, rather broadly lanceolate, long-acuminate, usually rounded or cordate at base, 4-7 inches long, on short stout petioles ($\frac{1}{2}$ -1 inch long) from near the base of the naked sheath; flowers and fruit nearly as in *P. amphibium*, but spikes more elongated (1-3 inches long), often in pairs.—New England to Texas and westward to Washington Territory and N. California. *P. amphibium*, var. *Muhlenbergii*, Meisn. in DC. Prodr., and including most of the var. *terrestris* of American botanists. *Proc. Amer. Acad.*, XIV, 1879.

ARISTIDA PURPUREA, Nutt.—Perennial; culms 6-15 inches high, simple, erect, slender, mostly glabrous; sheaths narrow, scabrous, exceeding the internodes, pilose at the throat; leaves very narrow, convolute, $\frac{1}{2}$ -10 inches long; panicle slender, erect or flaccid, 3-6 inches long, loosely few-flowered; glumes purplish, the upper one 6-9 lines long, about twice exceeding the lower, and longer than the flower, bifid and shortly awned; flower densely short-pilose at the base, scabrous above, 6 lines long, the awns equal or nearly so, separate to the base, not jointed, 1-2 lines long, scabrous.—From Western Texas and New Mexico to Arkansas and Colorado. *Watson in King's Rep.*

CORRECTIONS AND EXPLANATIONS.

Berula angustifolia (No. 306^a) is described in Gray's Manual under the synonym of *Sium angustifolium*. See Watson's *Bib. Ind. N. Am. Bot.*

For 422^a and 427^a of the "Contributions to the Flora of Iowa" for 1877 read 522^a and 527^a.

Gerardia setacea of "Flora of Iowa" (No. 545), and of Gray's Manual (not of Walt.) is *G. Skinneriana*, Wood. The true *G. setacea* of Walter is a Southern species. See *Syn. Fl. N. Am.*, II, 294.

Stachys palustris, L., var. *cordata*, Gr. (No. 596) should be changed to *S. palustris*, L., as the plant (common throughout the state) is the typical form, and not the variety. The var. *cordata*, is not likely to be found in Iowa: its range is much further south. See *Syn. Fl. N. Am.*

Lithospermum longiflorum, Spreng. (No. 605) is to be expunged from the "Flora of Iowa". The plant to which this name has been applied is only an early flowering state of *L. angustifolium*, Michx. The discovery of the identity of the two forms was first made by M. S. Bebb of Illinois in 1873. See *Amer. Nat.*, VII, 691. For the revised description of the species see *Gray's Syn. Fl. N. Am.* II, 205.

Physalis Virginica (No. 626) should be written *P. Virginiana*, Mill. See *Syn. Fl. N. Am.*, II, 235.

Some specimens remain over that have not been satisfactorily determined, for the most part because not complete enough. Among them are several interesting forms belonging to the genus *Astragalus*. It would be advantageous to have these reports made annually, and the only obstacle is the lack of material. Any information relating to the flora of Iowa will be gladly received; and every possible assistance will be rendered any person who desires to help in this work.

University of Wisconsin, Madison, Wis., December, 1880.

[From Proceedings of Davenport Academy of Natural Sciences.]

Contributions to the Flora of Iowa--No. V.*

BY J. C. ARTHUR.

The following list comprises the well authenticated additions to the previously published lists of Iowa plants. The material for it has been contributed by R. I. Cratty of Estherville, Emmett Co.; E. W. Holway of Decorah; John Leiberg late of Seney, Plymouth Co.; Dr. Geo. E. Ehinger of Keokuk; Prof. C. E. Bessey of Ames; Mrs. M. C. Carter of Hesper, Winneshiek Co.; M. E. Jones of Salt Lake City, Utah; and the writer.

- 192^a *Amorpha microphylla*, Pursh. Palo Alto and Clay Cos.
244^c *Potentilla palustris*, Scop. Emmett Co.
305^a *Cicuta bulbifera*, L. Emmett Co.
430^a *Helianthus Maximiliani*, Sehr. Emmett Co.
455^a *Artemisia annua*, L. Keokuk.
467^a *Senecio palustris*, Hook. Spirit Lake and Emmett Co.
520^b *Utricularia intermedia*, Hay. Emmett Co.
606^b *Mertensia paniculata*, Don. Decorah.
607^b *Echinosperrnum Redowskii*, Lehm., var. *occidentale*,
Watson. Decorah.
691^a *Rumex obtusifolius*, L. Decorah.
710^a *Euphorbia commutata*, Engelm. Decorah.
715^a *Ulmus racemosa*, Thomas. Waverly and Charles City.
757^a *Salix myrtilloides*, L. Emmett Co.
781^a *Potamogeton Illinoensis*, Morong. Emmett Co.
782^b *Potamogeton perfoliatus*, L., var. *lancoelatus*, Robbins.
Emmett Co.
784^a *Triglochin maritimum*, L., var. *clatum*, Gr. Emmett Co.
784^b *Scheuchzeria palustris*, L. Emmett Co.
787^b *Sagittaria cristata*, Engelm. ined. Emmett Co.
834^a *Juncus Balticus*, Deth. Emmett Co.
857^a *Eriophorum gracile*, Koch, var. *paucinervium*, Engelm.
Emmett Co.
860^a *Carex siccata*, Dew. Emmett Co.
867^a *Carex chondorhiza*, Ehrh. Emmett Co.

* Read at the June meeting of the Academy, 1882.

- 867^b *Carex Daceyana*, Schw. Spirit Lake.
 868^a *Carex stellulata*, L. Emmett Co.
 879^b *Carex stricta*, Schk., var. *fastuacea*, Boott. Grinnell
 and Ames.
 883^a *Carex limosa*, L. Emmett Co.
 892^b *Carex pubescens*, Muhl. Grinnell.
 893^d *Carex comosa*, Boott. Emmett Co.
 897^b *Carex retrorsa*, Schr. Emmett Co.
 897^c *Carex monila*, Tuck. Grinnell and Emmett Co.
 900^a *Lycisid lenticularis*, Mx. Montrose.
 920^a *Calamagrostis stricta*, Trin. Emmett Co.
 934^b *Glyceria aquatica*, Smith. Plymouth Co., and Hesper.
 935^a *Poa casia*, Smith. Hancock Co.
 961^a *Beckmannia cruaformis*, Host. Plymouth Co.
 962^a *Panicum filiforme*, L. Keokuk.

The following are descriptions of species not given in the 5th edition of Gray's Manual.

AMORPHA MICROPHYLLA, Pursh.—Nearly smooth, dwarf; leaves with very short petioles, obtuse at both ends; spikes short, solitary; calyx nearly naked, pedicellate, teeth all very acuminate; achenes 1-seeded. (*A. nutt.*, Nutt.)
 —On the banks of the Missouri. From 1 to 2 feet high; flowers purple and fragrant. A very elegant little shrub. *Pursh's Fl. Amer. Sep., II, 466.*

This compact little shrub is abundant on the dry prairies of northwestern Iowa. It flowers in May, and not in July and August as stated by Pursh. The leaflets are oblong, conspicuously punctate, and in 10–20 pairs.

HELIANTHUS MAXIMILIANI, Schrad.—Stem strigose-scabrous, branched; leaves alternate (those of the branches sometimes opposite), lanceolate, entire or nearly so, tapering to each end, acuminate, very scabrous and often canescent-strigose on both sides, the lower petioled; scales of the involucre lanceolate-subulate, much attenuate, strigose-canescens; pappus of two lanceolate slightly fringed chafly scales. —Prairies. Missouri, Texas. *Torrey and Gray's Fl. N. Am., II, 325.*

In Meehan's "Native Flowers and Ferns of the United States," where this species is finely figured, the range is said to be "probably confined to the hot and dry regions extending west of the Mississippi," and it is stated that "Lawrence, Kansas, seems to be about its northern boundary." It is, however, plentiful in Emmett County of this state, fully 300 miles further northward.

ARTEMISIA ANNUA, L.—Leaves twice pinnatifid, glabrous; divisions of the lower leaves lanceolate, incised, of the upper linear, pectinately pinnatifid; flowers paniced, globose, nodding.—Northern Persia, Siberia, and China.

Linnaeus' Syst. Veg., 16th ed., cur. Sprengel.

This was probably first brought to Keokuk as a cultivated plant, but has become a common weed.

ECHINOSPERMUM REDOWSKII, *Lehm., var. OCCIDENTALE. Watson.*—The American plant is less strict, at length diffuse, and the tubercles or scabrosities of the nutlet are sharp instead of blunt or roundish as in the Asiatic plant.—Plains, Saskatchewan and Minnesota to Texas, and west to Arizona and Alaska. *Gray's Synop. Fl. N. Amer., 190.*

The typical form of this species is a native of Northern Asia.

POTAMOGETON ILLINOENSIS, *Morong.*—Floating leaves opposite, thick, coriaceous, oval or ovate, 2-3 inches long by $1\frac{1}{2}$ broad, 19-23 nerved, on short petioles, submerged leaves comparatively few, oblong-elliptical, acute at each end, usually ample (the largest nearly 8 inches long and $1\frac{1}{2}$ wide), nearly or quite sessile, the uppermost opposite; stipules free, obtuse, strongly bicarinate, about 2 inches long; peduncles often clustered at the summit of the stem; spikes about 2 inches long, densely flowered; fruit roundish obovate, 3-keeled on the back, the middle keel prominent, and sometimes shouldered at the top, flattened and slightly impressed on the sides, obtuse or occasionally pointed at the base, the style short and nearly facial.—Allied to *P. Incens, L.* in habit, but with larger fruit, and in foliage quite distinct. Mississippi River bottoms near Oquawka, Ill. *Bot. Gazette, V, 50, 1880.*

SAGITTARIA CRISTATA, *Engelm. in d.*—Flowers only of the lowest whorl fertile; fruit-heads much larger than in *S. graminea*; achenia broad, with a conspicuous horizontal style, and crested back and sides.—Dr. Engelmann adds that this is near *S. graminea, Michx.*, and is perhaps only a variety of it, although the only other *Sagittaria* with such crests to the achenia is *S. natans, Michx.* Further observations are needed to eventually place it correctly. *Letter dated March 15th, 1882.*

BECKMANNIA, *Host.*—Panicle racemose, contracted; spikelets compressed, 2-flowered, the upper floret an abortive rudiment; glumes obovate, compressed boat-shaped, equal, a little shorter than the flower, pointless; paleas membranous, the lower ovate, mucronate, 3-nerved, the upper 2-nerved, bifid; grain free.

B. ERUCÆFORMIS, *Host.*—Culms stout, 1-3 $\frac{1}{2}$ feet high, with the sheaths glabrous; ligules elongated; leaves linear, 4-8 inches long, flat, scabrous; panicle 4-12 inches long, erect, strict, secund, the short crowded branches densely flowered from the base, glabrous; spikelets sessile, imbricately arranged in two rows, nearly orbicular; rudimentary floret stipitate. *Flor. Col., Port. and Coul.*

Heretofore these *Contributions* have embraced only the phanerogamic flora, but it is now proposed to extend them and include the lower plants as well as the higher. It seemed necessary at the start to concentrate attention upon the more easily observed and readily determined classes, in order that the results of the rather desultory herborizing of so few widely separated collectors might have some measure of completeness. No localities are yet exhausted; but several have been so well searched that resident collectors can now profitably turn their chief attention to the lower plants, as some of them have already begun to do. The interests of the phanerogamic flora are not likely to suffer by this expansion; and while waiting for portions of the state less frequented by botanists to be reported upon, and for the detection of obscure species at home, it will be profitable to record the observations on lower plants, both as a matter of record, and as a stimulus to increased activity. The next *Contribution* will accordingly contain a list of the pteridophytes (which include the ferns, horsetails, and club-mosses, although none of the latter have yet been reported from the state), and will be followed in subsequent numbers by a list of mosses, various classes of fungi, etc., as the accumulation of material will warrant. It is hoped the first published list of each class can be made quite full in both the number of species and their distribution. The same rule will be observed regarding the lower plants that has been adhered to for the higher — that every name reported shall be accompanied when possible by a specimen, in order to insure uniform accuracy, and to make it possible to revise the list at any future time by an examination of the plants themselves.

Charles City, Iowa; May, 1882.

