

species secundum talia specimina instituatur." [Is it possible that a species could be based on such specimens?]. *C. albicans*, possibly representing a very aberrant *C. nigro-marginata*, does not closely resemble any other specimen which I have seen. It is definitely not the plant now called *C. Peckii*, nor the coastal representative of *C. varia* with soft leaves and short staminate spikes, treated as *C. albicans* by Mackenzie.¹ It would seem best to drop the name entirely.

BROOKLYN BOTANIC GARDEN.

CONTRIBUTION FROM THE GRAY HERBARIUM OF
HARVARD UNIVERSITY—NO. CXXII

(Concluded)

VIII. NEW SPECIES, VARIETIES AND TRANSFERS

M. L. FERNALD

(Plates 497–507)

RECENT studies of plants of various groups in eastern North America have necessitated the changes of some names and combinations and the description of several heretofore unrecognized spermatophytes. The illustration of many of the latter has been made possible through grants for research from the Division of Biology of Harvard University and through the photographic skill of Dr. E. C. OGDEN or of my son, HENRY G. FERNALD.

ERAGROSTIS TRICHODES (Nutt.) Nash., var. **pilifera** (Scheele), comb. nov. *E. pilifera* Scheele in Linnaea, xxii. 344 (1849).

PANICUM (sub-§SCOPARIA) **recognitum**, sp. nov. (TAB. 497, 498), planta cespitosa 0.6–1.5 m. alta; culmis firmis basi 2–3 mm. diametro, internodiis elongatis 6 vel 7, glabris; nodis plerumque glabris vel glabratis; foliis rosulatis basilaribus lanceolatis firmis glabris 3–3.5 cm. longis 5–9 mm. latis 40–54-nerviis; foliis caulinis primariis 5–7 lanceolatis firmis glabris acuminatis 0.6–1.3 dm. longis 0.8–1.5 cm. latis basi cordatis ciliatis, vaginis horizontaliter hirsutis vel glabratis pilis basi bullatis, ligulis obsoletis; paniculis primariis deinde exsertis ovoideis vel ellipsoideis 0.8–1.3 dm. longis 6–10 cm. diametro, rhachi glabro, ramibus patento-adscendentibus minute barbellatis, pulvinis pubescentibus, pedicellis elongatis barbellulatis; spiculis pubescentibus ellipsoideis basi apiceque obtusis 2.2–2.8 mm. longis 1.2 mm. latis,

¹ N. Am. Fl. xviii. 190 (1935).

gluma inferiore deltoideo-ovata acuta 0.8–1 mm. longa, superiore lemmateque sterile aequilongis valde costatis fructus lucidos subaequantibus; statu autumnali sparse ramoso, ramibus elongatis adscendentibus, paniculis terminalibus 1.5–5 cm. longis.—Southern New Jersey and southeastern Pennsylvania. NEW JERSEY: Camden County: headwaters of branch of Timber Creek, Albion, September 7, 1910, *Bayard Long*, nos. 4944, 4946, June 27, 1912, *Long*, nos. 7671 (TYPE in Gray Herb., ISOTYPE in Herb. Phil. Acad.), 7672, 7676, July 9, 1912, *Long*, nos. 7790, 7792, 7794; head of Beaver Brook, Lawnside, June 12, 1916, *Long*, no. 15,030; northwest tributary of Cooper Creek, Ashland, June 29, 1918, *Long*, no. 19,315. Ocean County: open sandy and grassy area, Waretown, July 10, 1915, *Long*, no. 13,006. Cape May County: swamp north of New England Creek, July 6, 1912, *O. H. Brown*, no. 59. PENNSYLVANIA: Kennett Square, Chester County, July 4, 1903, *W. Stone*, no. 5305; Lancaster County, July 9, 1904, *J. J. Carter*.

Panicum recognitum, for many years set apart in the herbarium of the Philadelphia Botanical Club as a strange species, was called to my attention by Mr. Long at the time we discovered *P. mundum* Fernald in RHODORA, xxxviii. 292, t. 443, figs. 1–5 (1936). Mr. Long has sent me for study a very full series, showing the plant in all stages of development. Its relationship is apparently with *P. mundum* and with *P. scabriusculum* Ell., both of which have, in well developed plants, more numerous primary leaves, these less cordate at base and with short but definite ligules. From *P. scabriusculum*, furthermore, *P. recognitum* is at once distinguished by shorter primary leaves, elongate autumnal branches with exserted panicles, copiously barbellulate panicle-branches with hairy pulvini, obtuse pubescent spikelets, elongate 1st glume and long grain. In fact, it cannot be confused with *P. scabriusculum*, although it is likely to be traced to that species in current keys. From *P. mundum*, which has similar branching and panicles, the latter with hairy pulvini, and the blunt spikelets pubescent, it is at once separated by its more cordate leaf-blade, the widely spreading pubescence of the sheaths, the glabrous culms and mostly glabrous or glabrate nodes, the barbellulate pedicels, the more ellipsoid and longer spikelet and longer 1st glume.

Superficially *Panicum recognitum* might suggest *P. boreale* Nash, but only very superficially. The more slender and much lower *P. boreale* has fewer and glabrous-sheathed thinner leaves, panicle-branches flexuous, spikelets more obovoid and only 2–2.2 mm. long, with short 1st glume. Specimens sometimes of a single collection,

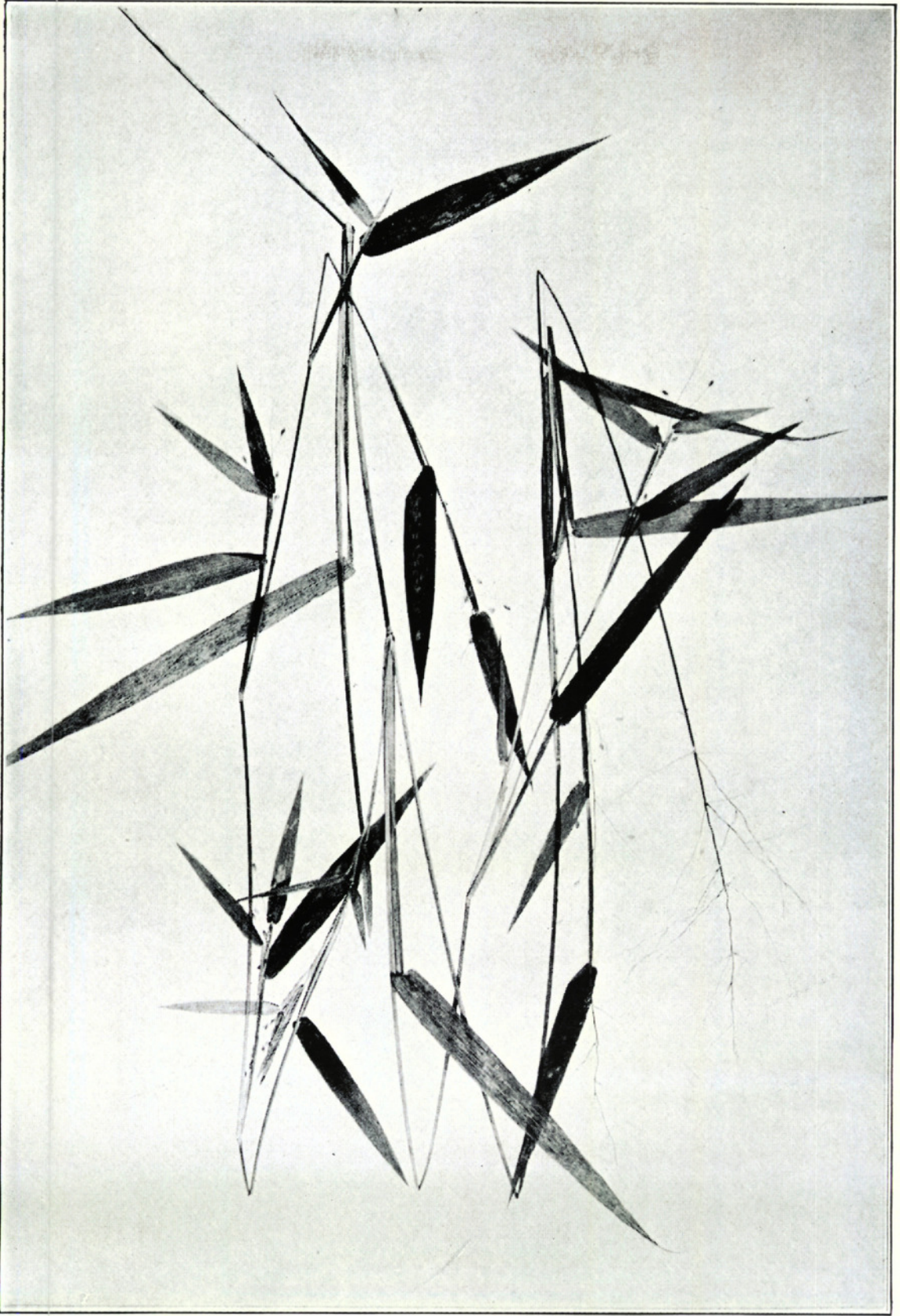


Photo. H. G. Fernald.

PANICUM RECOGNITUM: plant showing autumnal branching, $\times \frac{1}{2}$.

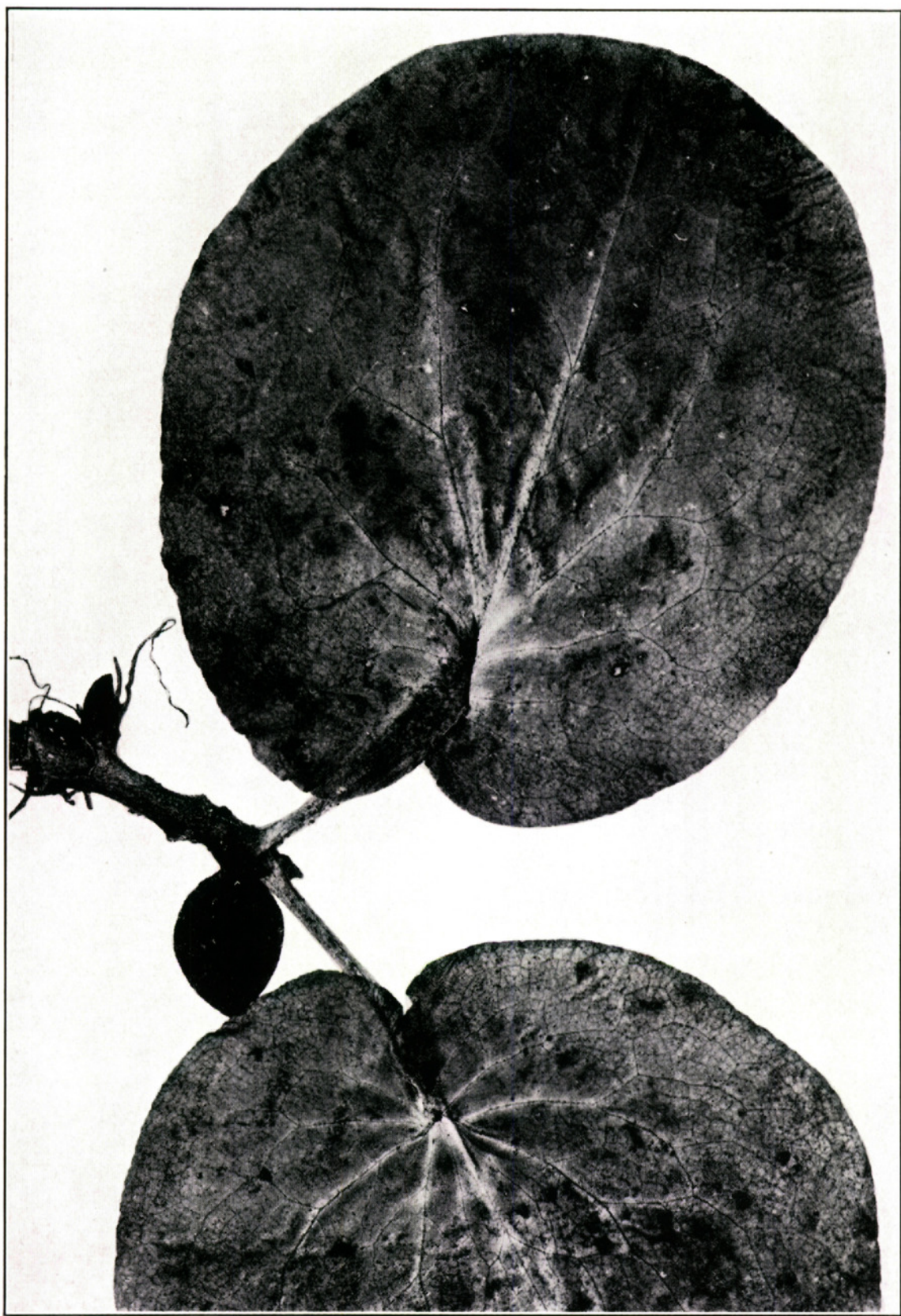


Photo. H. G. Fernald.

ASARUM CANADENSE, forma PHELPSIAE: TYPE, $\times 1$.

have been placed by different students under such very different species as *P. sphaerocarpum*, *P. Clutei* and *P. clandestinum*, such contradictory identifications clearly indicating the difficulty met in properly placing *P. recognitum* by existing keys.

Altogether, *Panicum recognitum* seems to be another of the highly localized species of sub-§*Scoparia*, comparable in its extreme localization with *P. aculeatum* Hitchc. & Chase, *P. cryptanthum* Ashe and *P. mundum*. If it were common over southern New Jersey and adjacent Pennsylvania the acute field-botanists who are there raking every spot would have so found it.

ASARUM CANADENSE L., forma **Phelpsiae**, forma nov. (TAB. 499), foliis suborbicularibus vel rotundato-ovatis apice late rotundatis basi rotundatis sinu clauso.—NEW YORK: on limestone ledges, Gouverneur, September 4, 1915, *Orra Parker Phelps*, no. 1143 (TYPE in Gray Herb.).

Mrs. Phelps states that this remarkable plant grows with typical *A. canadense* at Gouverneur; also at a similar station in De Kalb; both in St. Lawrence County. Plate 499 shows a portion of the TYPE, $\times 1$.

DROSERA INTERMEDIA Hayne, forma **corymbosa** (DC.), comb. nov. *D. intermedia*, β . *corymbosa* DC. Prodr. i. 318 (1824). Subvar. *corymbosa* (DC.) Rouy. Fl. de France, iv. 5 (1897).

AGRIMONIA STRIATA Michx., var. **campanulata**, var. nov. (TAB. 500, FIG. 1 et 2), foliolis ellipticis obtusis vel obtuse subacuminatis; hypanthio maturo campanulato basi rotundato 3–4 mm. longo 4–5 mm. lato, leviter costato.—Southwestern Colorado, New Mexico, Arizona and Mexico. The following are characteristic. COLORADO: moist north slope, alt. 7000 ft., Norwood Hill, San Miguel Co., August 17, 1912, *E. P. Walker*, no. 480. NEW MEXICO: Magollon Mts., Socorro Co., alt. 7500 ft., July 23, 1909, *O. B. Metcalfe*, no. 312. ARIZONA: Ramsey Canon, Huachuca Mts., September 29, 1929, *Marcus E. Jones*, no. 24,920 (TYPE in Gray Herb.); Upper Miller Canon, Huachuca Mts., August 14, 1909, *Goodding*, no. 405; Rincon Mts., September 20, 1909, alt. 7900 ft., *Blumer*, no. 3384; Barefoot Park, Chiricahua Mts., alt. 8000–8250 ft., September 9, 1907, *Blumer*, no. 1598; head of White River, White Mts., July 23, 1910, *Goodding*, no. 671. MEXICO: in the Sierra Madre, near Colonia Garcia, Chihuahua, August 28, 1899, *Townsend & Barber*, no. 290; City of Mexico, Federal District, October 9, 1898, *Holway*, no. 3235.

These specimens were mostly distributed as *Agrimonia Brittoniana* Bickn. (synonymous with *A. striata* Michx.) or as *A. Brittoniana*

occidentalis Bicknell. They were, perhaps, what the late Eugene P. Bicknell had in mind when he first applied the name *A. Brittoniana occidentalis* in the herbarium. But that name has no clear status. It was published as a *nomen nudum* for any *Agrimonia* occurring "from S. D. and Wyo. to N. M. and Ariz.," by Rydberg in his *Flora of Colorado* (Agr. Expt. Sta. Col. Agr. Coll., Bull. 100), 189 (1906). It had absolutely no descriptive word and the name, consequently, has no status. Even Rydberg himself, in his treatment of *Agrimonia* in the *North American Flora*, xxii⁵. 391–396 (1913) failed to mention it, but he mistook extreme plants of *A. striata*, var. *campanulata* for the northeastern and Californian *A. gryposepala* Wallr. He so identified Holway's material from Mexico City and he doubtless included the extreme New Mexican plants with it, giving the range for *A. gryposepala* "Nova Scotia to North Carolina, Nebraska, and North Dakota; apparently also California, New Mexico and Mexico" (l. c. 292). Except for the series from the Pacific slope (southern British Columbia to California), there is no indication in the Gray Herbarium of *A. gryposepala* from west and southwest of eastern Nebraska and Missouri.

Var. *campanulata* differs from typical transcontinental *Agrimonia striata* in its thinner and blunter leaflets (those of typical *A. striata* being usually firm, more or less canescent beneath, with long-acuminate to acute tips) and its round-based and broad fruiting hypanthium (FIG. 2); the ripe hypanthium in typical *A. striata* (FIG. 3) being cuneately turbinate, 3–4.5 mm. broad at summit and very deeply furrowed, whence the name. It occurs from Newfoundland to British Columbia and southward, in the West following the Rocky Mountains in typical form to Wyoming, with specimens clearly transitional to var. *campanulata* from as far south as New Mexico and Arizona.

POLYGALA VERTICILLATA L., var. **isocycla**, var. nov. (TAB. 501, FIG. 2 et 3), planta 0.5–2 dm. alta, plerumque ramosa, ramibus divergentibus vel oblique adscendentibus; foliis lanceolatis vel lanceolato-linearibus submembranaceis plerumque verticillatis, verticillis 3–7-foliatis; pedunculis 0.5–4 cm. longis; racemis densis lanceolato-cylindricis vel lanceolato-conicis apice attenuatis, parte florifero 0.5–1.2 cm. longo, viridiscentibus vel albidis; pedicellis 0.1–0.3 mm. longis; capsulis 1–1.6 mm. longis. *P. verticillata* sensu Pennell in *Bartonia*, no. 13: 9, pl. 2 (1932), not L., as to TYPE.—Dry or moist sterile open habitats, Massachusetts to southern Manitoba, south to

Florida, Alabama, Louisiana and Texas. TYPE: sandy field, Frazer, Chester Co., Pennsylvania, August 7, 1910, *E. B. Bartram*, no. 1124 (in Gray Herb.).

As noted, var. *isocycla* is the extreme of the polymorphous *Polygala verticillata* which Pennell treats as typical *P. verticillata* L. Sp. Pl. 706 (1753); whereas the plant (our FIG. 1) which Linnaeus indubitably had before him in preparing his own original *new* diagnoses in Species Plantarum, 706 (1753), which he personally marked "*verticillata*," and which in its technical details clearly matches his exact new diagnoses, is the ascending-branched and mostly taller plant with fewer and narrower leaves (3–5) in a whorl, the upper and frequently all but the lowest mostly scattered, the peduncles commonly long, the white to purplish racemes rather lax, the floriferous portion (after falling of basal fruits) 1–2 cm. long, the pedicels 0.5–2 mm. long, the seeds with slightly longer pubescence. The latter, which is the plant accurately described by Linnaeus from the material in his own herbarium, is *P. Pretzii* Pennell, l. c. 12, pl. 3, fig. 1 (1932).

Our nomenclature, most fortunately, does not reach back of 1753, and the typification of names obviously should stop there, except in those cases where Linnaeus based his species and other groups *solely* on specimens and diagnoses of earlier date. Whenever in 1753 Linnaeus had before him and clearly designated in his own herbarium a recognizable specimen and when he gave an original diagnosis which closely matches it, the references to earlier works should be treated as of minor importance if our taxonomy and nomenclature are to rest on the most secure bases possible. Otherwise, if the less clear and often quite confused writings prior to 1753 are given preference, we enter needlessly debatable and always unsatisfactory ground and taxonomy and nomenclature become unnecessarily obscure at points where they should be perfectly clear. The older diagnoses quoted by Linnaeus, as Dr. Pennell definitely shows, pertained to different entities, which he recognizes as species but which Gray, Blake (N. Am. Fl.) and most others have considered merely varieties of one variable species; and Dr. Pennell learnedly discusses the possible applications of the earlier polynomials. As studies in ancient history such speculations may be interesting but the deductions from them are needless and, as experience shows, where they are merely deductions they are exceedingly liable to error and they are too often prejudicial to the result where Linnaeus in 1753 gave a new and original account of his species

based upon actual specimens before him; only the latter is then really important. Pennell recognized that the plant in the Linnaean herbarium has some significance, saying:

"But still a further complication is introduced by the fact that by 1753 Linné had acquired for his herbarium the single specimen placed by him under this name; this came from Kalm, who collected in Pennsylvania and northward, and it was the second species of the key, named above *P. pretzii*. A plea might be made that it should be accounted the basis of *Polygala verticillata*, but against this is the fact that Kalm's plants were received so late as often to have had little influence on Linné's decisions and especially the further fact that it does not so well fit the Linnean diagnosis as does the first species of our key; the latter shows more perfectly the verticillate phyllotaxis and much better the remote disposition of the racemes."¹

In order to be quite clear as to Pennell's interpretation it is wise to copy from his key-characters and descriptions of his *P. verticillata* (our var. *isocycla*) and his *P. Pretzii* (*P. verticillata* of L. herb.) the phrases describing the features he discusses:

1. *P. VERTICILLATA* sensu Pennell. Raceme slender, *dense* and conic, the sepals greenish-white; leaves all in whorls of 3-7, only the uppermost occasionally opposite or scattered; plant "1-2" (or "1-3") dm. tall, with widely spreading branches and the racemes on peduncles 0.5-4 cm. long.

¹ Pennell's argument, that "Kalm's plants were received so late as often to have had little influence on Linné's decisions," is at least novel. It is also difficult to reconcile with the well known fact, that Kalm came to America at the instigation of his teacher, Linnaeus, who, on October 23, 1747, wrote to Adalbert von Haller; "Kalm is lately gone to England, from whence he will proceed to Canada, in order to collect seeds for the Upsal garden, as the plants of that country bear our winters perfectly well. He is a pupil of mine, and has just been appointed oeconomical professor at Abo, in consequence of my recommendation"—J. E. Smith, *Sel. Corr. Linnaeus*, ii. 417 (1821). In August, 1748, Linnaeus again expressed keen interest in Kalm's enterprise, writing to John Mitchell, "I hope his journey will be prosperous. I have rendered him every service in my power." (Smith, l. c. 446). In the winter of 1750-51 Kalm started home to Sweden and on February 1, Cadwallader Colden wrote to Linnaeus from his estate in New York of having sent to him by Kalm some notes on American plants (Smith, l. c. 457); and Kalm himself, during his American travels, had taken every opportunity to transmit detailed accounts of his discoveries, sent "*a Monsieur Charles Linnaeus Premier Medecin du Roy et Professeur en Medicine et Botanique d'Upsal*" or "*To The Secretaire of the Swedish Royal Society of Sciences in Upsal in Sweden, Master Charles Linnaeus*." From Kalm, returned to Sweden, Linnaeus received detailed letters, written from Stockholm and sent to Upsala, beginning in May, 1751, and continuing for some years. These letters are full of details regarding "Pennsylvanien, Nya Yersey, Nya York och Nya England" and regarding the plants which Kalm had carried back to Sweden. (See especially J. M. Hulth, *Bref och Skriftoelser af och till Carl von Linné*, viii.¹ 1-118 (1922), these pages being the letters from Kalm to Linnaeus). Linnaeus had Kalm's collections at least two full years before the publication of *Species Plantarum*. Those who believe that he was not profoundly interested in them and that they "had little influence on Linné's decisions" have an original and difficult thesis to defend. If Kalm's material was of so little significance, it is singular that many species were based solely upon his plants.

2. *P. PRETZII* Pennell (*P. verticillata* L. herb.). Raceme *looser*; the sepals white or somewhat pinkish; leaves in whorls of 3–5, the upper or sometimes nearly all scattered; plant usually 2–3 dm. tall, with ascending branches and the racemes on peduncles 2–7 cm. long.

Pennell lays much stress on the more generally verticillate leaves of his no. 1, as meaning to him that Linnaeus really intended that plant with “dense” racemes of greenish-white flowers. He also feels that the plant which Linnaeus had in his own herbarium and ticketed “*verticillata*” (Pennell’s no. 2), “does not so well fit the Linnean diagnosis as does the first species of our key; the latter shows more perfectly the verticillate phyllotaxis and much better the remote disposition of the racemes.”

Linnaeus had two brand new or original (unquoted) diagnoses for his *P. verticillata*. The first was taken over largely from that of his pupil, Jonas Kiernander (1751), but with most significant differences. Kiernander’s diagnosis had been: “POLYGALA floribus imberbibus spicatis, caule erecto herbaceo filiformi ramoso, foliis linearibus;¹ but in his own description, in 1753 (the first diagnosis which absolutely concerns us), Linnaeus added the facts that the leaves are *verticillate*, as they are in either 1 or 2 of Pennell, and the flowers *remote* in the spike (“spicis floribus remotis”, which Pennell, most unfortunately, renders “the remote disposition of the racemes”). From his mis-translation of this diagnosis Pennell deduces that Linnaeus meant the plant with racemes “dense” and “conic,” not the one with them “looser.” The second and wholly new diagnosis of Linnaeus read “Folia saepius quina ad genicula, interdum alterna. Spicae albae, angustissimae flosculis remotis,” which, rendered into English, would be: “leaves frequently 5 to a node, sometimes alternate; spikes white, very slender, with the flowers remote.” In view of the fact that Linnaeus had, two years before the publication of this new and clear diagnosis, received the American collections of his student Kalm, who had gone to America at Linnaeus’s instigation, and had placed in his own herbarium a couple of Kalm’s plants which he labeled “*verticillata*” (see our FIG. 1), there should be no serious doubt that this material, accurately displaying the several points in the second and wholly new diagnosis of Linnaeus, should stand as the TYPE of his *Polygala verticillata*. The arguments that by “Folia saepius quina ad genicula, interdum alterna” Linnaeus intended to say “Leaves all in

¹ Kiernander in L. Amoen. Acad. ii. 139 (1751).

whorls of 3 to 7, only the uppermost occasionally opposite or scattered" and that by his "*Spicae albae, angustissimae flosculis remotis*" he really meant "Racemes [spikes] dense" and "conic," with "greenish-white" sepals, are unconvincing.

Polygala verticillata, var. *isocycla* (FIGS. 2 and 3) might be considered inseparable from var. *sphenostachya* Pennell in *Bartonia*, no. 13: 12 (1932) (our FIG. 4). Treating as *P. verticillata* (typical) the plant I am calling var. *isocycla*, with "Capsule 0.9–1.2 mm. long," his var. *sphenostachya* was defined "Floribus et fructibus majoribus diversa," which in the key on the preceding page was clarified: "Capsule about 1.5 mm. long; plants usually 1.5–3 dm. tall." A fine sheet of isotypes (*Bush*, no. 7692) of var. *sphenostachya* is in the Gray Herbarium. Its capsules are not well developed, the racemes being relatively young, but the most mature capsules, when checked by a thin and finely divided metal measure show lengths of 2–2.3 mm. (FIG. 4). Dr. S. F. Blake writes me that the TYPE in the National Herbarium likewise "has fruits measuring 2–2.3 mm. long." Similarly, a considerable series, occurring in the Mississippi Basin and adjacent areas, shows capsules of like size. These plants with large capsules (much larger than originally defined) are var. *sphenostachya*, because of the cited type. Var. *isocycla* is more wide-ranging, and occurs on the Atlantic slope as well as westward. It is smaller in general than var. *sphenostachya* and its capsules (FIG. 3) are 1–1.6 mm. long, the largest ones reaching the measurements of the smallest in var. *sphenostachya*. Such transitional specimens are, naturally, difficult to pigeon-hole.

NYMPHOIDES cordatum (Ell.), comb. nov. *Villarsia cordata* Ell., Sk. Bot. S. C. and Ga. i. 230 (1816 or '17). *V. lacunosa* sensu Eaton Man. Bot. No. Mid. States, ed. 2, pt. 2: 492 (1818); sensu Torr. Fl. No. Mid. U. S. i. 215 (1824); sensu Bigel. Fl. Bost. ed. 2: 78 (1824); and later authors, not Ventenat, Choix des Plantes, 9 (1803). *Limnanthemum lacunosum*, α . Griseb. Gen. Sp. Gent. 47 (1839), as to plant described, not as to source of specific epithet. *N. lacunosum* Fernald in RHODORA, x. 54 (1908), as to plant, not as to source of specific epithet.

We have two native species of *Nymphoides*: one a small plant, ranging from Florida and Louisiana northward to southeastern Canada and Newfoundland, known in recent works as *N. lacunosum* or *Limnanthemum lacunosum*; the other much coarser, occurring from Florida to Texas, and northward on the coastal plain to Delaware and southern



Photo. H. G. Fernald.

AGRIMONIA STRIATA: FIG. 3, fruit, $\times 8$.
A. STRIATA, var. CAMPANULATA: FIG. 1, plant, $\times \frac{3}{8}$, from Arizona; FIG. 2, fruit, $\times 8$, from TYPE.



Photo. E. C. Ogden.

POLYGALA VERTICILLATA: FIG. 1, one of the 2 plants in Linnean Herbarium (TYPE), $\times 1$, courtesy of Mr. Spencer Savage.

Var. ISOCYCLA: FIG. 2, TYPE, $\times 1$; FIG. 3, raceme, $\times 4$, from TYPE.

Var. SPHENOSTACHYA: FIG. 4, raceme, $\times 4$, from ISOTYPE.

New Jersey, known, correctly, as *N. aquaticum* (Walt.) Ktze. The two are distinguished as follows:

N. CORDATUM (*N. LACUNOSUM* of recent authors). Floating leaves with filiform smooth petioles, the cordate-ovate blades 1.5–5 cm. broad, often mottled or variegated above, scarcely or only minutely pitted beneath; spur-roots frequent; calyx 3–5 mm. long; corolla 0.5–1 cm. broad; capsule ovoid-subglobose, 3–5 mm. long; seeds smooth.

N. AQUATICUM. Floating leaves with cord-like often purple-glandular petioles, the suborbicular to reniform thick blades 0.4–1.5 dm. broad, usually green above, abundantly and coarsely vesicular and pitted beneath; spur-roots less frequent; calyx 4–8 mm. long; corolla 1–2 cm. broad; capsule elongate, 6–9 mm. long; seeds glandular-roughened.

The first North American species defined was *Anonymos aquatica* Walt. Fl. Carol. 109 (1788), clearly described “foliis peltato-reniformibus, coriaceis, subtus punctatis,” etc. It was also described as *Menyanthes trachysperma* Michx. Fl. Bor.-Am. i. 126 (1803): “*M. habitu nymphoideo . . . seminibus vesiculis ovatulo-oblongis conspicue scabris.*” There is no question as to the plants of Walter and of Michaux; and Michaux cited *Villarsia aquatica* (Walt.) Gmel. as the same as his *Menyanthes trachysperma*, giving a new name descriptive of the characteristic seeds.

No distinction was noted by the northern botanists, Eaton, Torrey, Bigelow and others of their period, because they knew only the slender and small northern species; and when Grisebach treated the genus he created a confusion which every one has followed, although in 1912, in a foot-note, Dr. Witmer Stone¹ noted the error involved. Considering both our plants as constituting one species with two varieties, Grisebach, l. c., called the small plant *Limnanthemum lacunosum*, α ., with the synonym, derived from an herbarium-name, *Menyanthes punctata* Muhl.; the larger plant, *L. lacunosum*, β . *australe*, “*magnitudo decies major, lacunis quoque majoribus,*” with *Anonymos aquatica* Walt., *Villarsia aquatica* (Walt.) Gmel. and *Menyanthes trachysperma* Michx. cited as belonging to it. Most singularly, Grisebach cited *Villarsia lacunosa* Ventenat as belonging to his var. α ., not to his var. β .; and Gray, Britton and most others have faithfully followed Grisebach’s erroneous course as to the identity of *Villarsia lacunosa*. Furthermore, northern botanists, familiar with the lake- or pond-habitat of the small species, have forced the Latin name into signifying the habitat.

Ventenat, however, as pointed out by Stone, was simply giving to

¹ Stone, Pl. So. N. J. 644 (1912).

the large southern plant a new specific name, a substitute for those already given it; and the new and quite *illegitimate* name was in recognition of the superabundant pits (lacunae) in the lower leaf-surface! Here is Ventenat's treatment:

"Le genre VILLARSIA comprend les espèces suivantes:

V. lacunosa (ANONYMOS *aquatica*, WALTHER, *Flor. Carolin.* VILLARSIA *aquatica* (2). GMEL. *Syst. Veget.* et BOSC, *Bullet. de la Soc. Philom.*) Foliis reniformibus, subpeltatis, subtus lacunosis, natantibus; petiolis floriferis; corollis glabris."¹

That *Villarsia lacunosa* Vent. was merely the coarse southern plant is sufficiently evident. Surely the name did not apply to the slender and usually more northern species nor can it be used for any species, being merely a substitute or illegitimate name.

Stephen Elliott clearly understood the two plants. The coarse southern species he called *Villarsia trachysperma*, based on *Menyanthes trachysperma* Michx., with Walter's *Anonymos aquatica* as a synonym, and described: "*Leaves* . . . frequently orbicular, 3-4 inches in diameter, . . . underneath . . . covered with vesicular points. *Petioles* . . . dotted, sometimes roughened . . . Flowers June."² The slender plant was beautifully described by him as *Villarsia*

"1. CORDATA. E.

V. foliis cordatis, integerrimis; | *Leaves cordate, very entire;*
petiolis floriferis. E. | *petioles bearing the flowers.*

Grows in shallow streams. *Petioles* . . . slender, glabrous. *Leaves* about an inch long, exactly cordate, variegated. . . . Flowers July-September."

A fragment of Elliott's type, long ago secured by Asa Gray, is wholly characteristic.

Treating the small-leaved and slender plant as *Limnanthemum lacunosum* (following Grisebach), Gray gave in the synonymy in the Synoptical Flora Elliott's name, saying "*V[illarsia] cordata*, Ell. Sk. i. 230, a fitter name." Not only is it "a fitter name"; so far as I have found, it is the only name that fits.

HALENIA DEFLEXA (Sm.) Griseb., forma **heterantha** (Griseb.), comb. nov. *H. heterantha* Griseb. Gen. Sp. Gent. 325 (1839). *H. deflexa*, var. *heterantha* (Griseb.) Fern. in RHODORA, i. 37 (1899).

¹ Vent. Choix des Plantes, 9 (1803).

² Ell. Sk. Bot. S. C. and Ga. i. 230 (1816 or '17).

Although spurless flowers frequently occur late in the season on plants which early produced spurred corollas, the spurless flowers often are the only ones produced. Forma *heterantha* is, then, a peculiarly interesting reversionary form.

HYDROPHYLLUM VIRGINIANUM L., forma **simplicifolium**, f. nov. (TAB. 502), foliis simplicibus laminis 4–9 cm. longis lobis obtusis; calicibus 3–4 mm. longis; corollis 5–6 mm. longis lobis angustis.—VERMONT: rich woods, Charlotte, June 6, 1879, *Pringle* (TYPE in Gray Herb.).

The extraordinary plant shown in plate 502, $\times 2/5$, was labelled by the late Sereno Watson as an unpublished new species. Its publication was stopped by a letter coming from Pringle, stating that search through the area showed that no fruit was set and that in some cases forma *simplicifolium* was springing from rhizomes which likewise bore the typical large-flowered and large- and pinnate-leaved *Hydrophyllum virginianum*. This letter of Pringle's suggests that forma *simplicifolium* is a root-sport. It is so remarkable that it would be of great interest to rediscover it.

HACKELIA americana (Gray), comb. nov. (PLATE 503). *Echinosperrum deflexum*, var. *americanum* Gray in Proc. Am. Acad. xvii. 224 (1882). *Lappula deflexa*, var. *americana* (Gray) Greene, Pittonia, ii. 183 (1891). *L. americana* (Gray) Rydberg in Bull. Torr. Bot. Cl. xxiv. 294 (1897). *Hackelia deflexa* sensu I. M. Johnston in Contrib. Gray Herb. n. s. lxviii. 45 (1923), as to North American plant, not (Wahlenb.) Opiz. *H. deflexa*, var. *americana* (Gray) Fernald & Johnston in Fernald in RHODORA, xxvi. 124 (1924).

Although all students of the *Boraginaceae*, except Rydberg, have treated the plant of calcareous slopes and bluffs, which occurs from the Gaspé Peninsula, Quebec to southern British Columbia, south interruptedly to northern New Brunswick, northern Vermont, the Bruce Peninsula, Ontario, northern Michigan, Wisconsin, Iowa, Nebraska, Montana, Idaho and Washington, as conspecific with the Eurasian *Hackelia deflexa* (Wahlenb.) Opiz (PLATE 504) (or *Myosotis deflexa* Wahlenb., *Echinosperrum deflexum* (Wahlenb.) Lehm., *Lappula deflexa* (Wahlenb.) Roth), there are several very marked characters which separate them.

Gray's original account, under *Echinosperrum*, was as follows:

"E. DEFLEXUM, Lehm. Nutlets only marginally glochidiate, with the dorsal disk minutely scabrous: in var. AMERICANUM (which makes some approach to *E. Virginicum*) the somewhat more granulate dorsal disk

not rarely bears two or three small glochidiate prickles on an obscure mid-nerve!"

Gray had four specimens before him: Clinton County, Iowa, *Geo. D. Butler*: Lake Winnipeg, *Bourgeau*: Saskatchewan, *Bourgeau*: West Kootenay, *Lyall*. The Bourgeau sheet from Saskatchewan alone bears Gray's varietal name in his hand and the pocketed fruits with his memoranda; it should stand as the TYPE. The character used by Gray is wholly variable; consequently, in revising the material in the Gray Herbarium in 1915, Mr. J. Francis Macbride ticketed it all *Lappula deflexa*. These revision-labels of Macbride's have superimposed upon them those of Dr. I. M. Johnston in 1923, agreeing as to identity, but calling the plant *Hackelia deflexa*, an unequivocal reduction of the American plant to the species of eastern Europe and Asia maintained in Johnston's detailed *Restoration of the Genus Hackelia*—Contrib. Gray Herb. n. s. lxxviii. 45 (1923). Very familiar with the American plant as it occurs on the limy talus and bluffs of Gaspé, I could not feel that its broader and more acuminate leaves and the narrower and straight-edged deltoid nutlets indicated exact identity with the Eurasian plant with narrow leaves and more ovate nutlets. I consequently induced Dr. Johnston in 1924 to join me in reviving var. *americana* under *H. deflexa*.

Now, however, faced with the necessity of reviewing the situation in rewriting Gray's Manual, I find so many differences that I am unable to unite the Old World *Hackelia deflexa* and the American *H. americana* and in the Gray Herbarium am superimposing a third revision-slip on the two already there! Briefly the differences are these:

H. DEFLEXA (PLATE 504, FIGS. 1-7). Cauline leaves linear-lanceolate to narrowly oblanceolate, obtuse or merely acute, 0.25-2 cm. broad; racemes with some flowers usually supraaxillary (FIGS. 1-3), the mature pedicels mostly 0.5-2.5 cm. apart; bracts (FIGS. 1-3) of the ascending racemes well developed, the lower and usually all with dilated obtuse or merely acutish blades; expanded corollas (FIG. 4) 3-6 mm. broad; mature fruit (FIGS. 5-7) with nutlets intact and, including glochidia, 4-6 mm. long; open back of mature nutlet (FIGS. 5-7) ovate, 1.5-2 mm. broad, with blunt pebbling and with an elevated wing-margin formed by the fused lanceolate flat bases of the glochidia.

H. AMERICANA (PLATE 503). Cauline leaves elliptic-lanceolate to narrowly elliptic-ovate, mostly acuminate, the principal ones 0.5-3 cm. broad; flowers mostly approximate to their bracts (FIGS. 1, 3 and 4), the mature pedicels 3-10 (rarely -20) mm. apart; bracts (FIGS. 1, 3 and 4) of the less ascending racemes poorly developed, the lowest with lance-acuminate blades, all the others greatly reduced and inconspicuous,



Photo. H. G. Fernald.

HYDROPHYLLUM VIRGINIANUM, forma SIMPLICIFOLIUM: TYPE, $\times \frac{2}{5}$.



Photo. H. G. Fernald.

HACKELIA AMERICANA: FIG. 1, portions of plant, $\times 1$, from Michigan; FIG. 2, expanded flower, $\times 4$, from Michigan; FIGS. 3 and 4, fruiting branches, $\times 1$, from Quebec; FIG. 5, fruit, $\times 8$, from Quebec; FIG. 6, nutlet, $\times 8$, from Michigan.

linear-attenuate; expanded corollas (FIG. 2) 1.5–3 mm. broad; mature fruit (FIGS. 5 and 6) including glochidia, 3–4.8 mm. long; open back of mature nutlet narrowly deltoid-ovate, 1–1.5 mm. broad, muriculate-pebbled, the marginal glochidia mostly distinct and linear-subulate.

In the plates illustrating details of the two species the habit is shown, $\times 1$; the portions of inflorescence showing bracts and pedicels, $\times 1$; details of flowers, $\times 4$ and fruits, $\times 8$. In *Hackelia americana* the calyx has fine and less rigid strigose pubescence than in *H. deflexa*; and the backs of the nutlets are more generally hispid than in *H. deflexa*. The latter character is too variable, however, to be emphasized, as is the tendency in *H. americana* sometimes to bear a few glochidia (FIG. 6) on the back of the nutlet. When these occur *H. americana* somewhat suggests *H. virginiana* (L.) I. M. Johnston. The latter has foliage similar to that of *H. americana* but larger, and its flowers are nearly as small and its racemes similarly bracted; but in *H. virginiana* the short-pedicelled fruits (PLATE 504, FIG. 8) are subglobose and the ovate backs of the nutlets are almost hidden by the abundant glochidia.

I am taking up *Hackelia* Opiz for the species with deflexed pedicels which have long been included under *Lappula*. This I do in deference to the vastly superior knowledge of generic lines in the *Boraginaceae* of Dr. Johnston. In his *Restoration of the Genus Hackelia*, already referred to, he gave the generic distinctions as follows:

“LAPPULA. Annual; inflorescence abundantly bracteate; pedicels erect; gynobase subulate, 5–10 times as tall as broad, about equaling the nutlets; style surpassing the nutlets; nutlets narrowly attached all along the well developed medial ventral keel.

HACKELIA. Biennial or perennial; inflorescence naked or rarely sparsely bracteate; pedicels recurved or deflexed in fruit; gynobase pyramidal, less tall than broad; style definitely surpassed by nutlets; nutlets attached by a large oblique submedial ovate or deltoid areola; ventral keel extending over only upper half of nutlet.”

The characters of the fruit and the gynobase are, I take it, constant; so, apparently, is the duration of the plants. The type of *Hackelia*, *H. deflexa*, has a bract opposite or alternating with many or all flowers; so have the two species of Atlantic North America above noted. As a fundamental generic character the *lack* of bracts is not well displayed in these three species. It is likewise significant that in 1924, in a synopsis of the American species of *Lappula*, which in 1923 had as one of its generic distinctions “style surpassing the nutlets”, the monographer should have used as a key-character

separating *L. brachystyla* from *L. Redowskii* "Style exceeded by nutlets" in the former, opposed to "Style surpassing nutlets" in the latter.

ERIGERON ELATUS Greene, var. **oligocephalus** (Fern. & Wieg.), comb. nov. *E. acris*, var. *oligocephalus* Fern. & Wieg. in RHODORA, xii. 226 (1910) as to TYPE, *Fernald & Wiegand*, no. 4138. PLATE 505, FIGS. 1 and 2.

The species of *Erigeron* § *Trimorphaea* (Cass.) DC. are as baffling as any in the genus. In temperate eastern North America the section is represented by the quite characteristic *E. lonchophyllus* Hook. (*E. armerifolius* Turcz.) on Anticosti, the Mingan Islands and adjacent mainland of Saguenay County, Quebec, there isolated from the West, and the three very characteristic plants which have passed as *E. acris* L. and varieties of it. Typical *E. acris* of Europe (extending across Asia) does not seem to occur in North America. Habitally somewhat like the Eurasian and North American plant which has erroneously passed as *E. acris* (or as its var. *droebachensis* (O. F. Muell.) Blytt or var. *asteroides* (Andrz.) DC.), it has nonglandular peduncles and involucre, the latter coarsely hispid (FIG. 5). The wide-ranging plant which crosses North America has glandular-pruinose peduncles (FIG. 4) and the involucre bracts essentially glabrous except for glandularity or viscidiness. This is *E. elongatus* Ledeb. Ic. Fl. Alt. i. 9, t. 31 (1829) which was more fully described by Ledebour in Fl. Alt. iv. 91 (1833). It is also, perhaps, *E. droebachensis* O. F. Mueller in Fl. Dan. v. fasc. xv. t. decclxiv (1782), which was published in a largely polynomial work and which did not receive validation, apparently, until taken up by Fries, Summ. Veg. Scand. 183 (1846). The exact application of the name *E. droebachensis* is open to doubt, several Scandinavian authors placing it with *E. acris*, others (Lindman, for instance) indicating it as a mixture. Our plant is likewise, apparently, the one treated by DeCandolle, Prodr. v. 290 (1836) as *E. acris*, var. *asteroides*, based on the doubtful *E. asteroides* Andrz. The first name for this plant which is wholly free from doubt and the one used by Lindman, Hultén and other progressive students of boreal floras is *E. elongatus* Ledeb. Later names are *E. yellowstonensis* A. Nels. in Bot. Gaz. xxx. 198 (1900) and *E. lapiluteus* A. Nels. in Coult. & Nels. Man. Bot. Rocky Mts. 530 (1909). In the Rocky Mountains *E. elongatus* sometimes has hispid peduncles and involucre; consequently Gray took it to be true *E. acris* and under the latter name he

included specimens of all the plants here considered, even including *E. lonchophyllus*. All these Rocky Mountain specimens which I have seen, however, of the tall and stiff plant have the pruinose-glandular peduncles and bracts, the glands somewhat hidden by the long trichomes. To me it seems to be merely an extreme of *E. elongatus*.

Erigeron elatus Greene, Pittonia, iii. 164 (1897), said to be *E. alpinus*, var. *elatus* Hook. Fl. Bor.-Am. ii. 18 (1834), was given a full description by Greene. Its stems "bearing at summit either a solitary rather large head, or 3 to 5, which are slender-peduncled and subcorymbose . . . involucre 4 or 5 lines high and 6 in breadth, bracts linear-acuminate, almost hispidly short-hirsute, not glandular, unequal, the outer little more than half the length of the inner" show that Greene was describing, as he said, a plant "common in the mountains of British Columbia, where Mr. Macoun has repeatedly collected it." Plants sent out by Macoun as *E. elatus* and similar ones of earlier date are exactly the plant called by me *E. acris*, var. *arcuans* in RHODORA, xxviii. 236 (1926). A characteristic involucre, $\times 2$, is shown in FIG. 3.

As I see it, we must accept *Erigeron elatus* as the plant clearly defined by Greene, although he drew his name from *E. alpinus*, var. *elatus* Hook. Fl. Bor.-Am., for there is absolutely nothing in Hooker's account to show what he had. *E. alpinus* is a very definite European species not represented with us, except by *E. borealis* (Vierh.) Simons in arctic America; and it differs from all representatives of *E. acris* in having double, instead of single pappus. Hooker, misidentifying something as *E. alpinus*, had a var. β . without name, and " γ . *elata*; subpedalis." Surely the mere statement of height, without any other character, is not enough; at best *E. alpinus*, var. γ . *elatus* Hook. was a *nomen subnudum*. It so happens that Hooker gave to Asa Gray as his var. γ . *elatus* a specimen which is not the small-headed plant described by Greene. It seems to be the large-headed extreme which is represented by the type of *E. acris*, var. *oligocephalus* Fern. & Wieg. In view of Greene's clear and unusually careful definition of the smaller-headed extreme of *E. elatus* and Hooker's quite undistinguishing word under his *E. alpinus*, var. γ . *elatus*, it would be pushing the type-concept to its utmost absurdity to say that Greene's *E. elatus* is not the plant he accurately described, because, without more than wrongly guessing as to the identity of Hooker's plant, he cited the latter. I, therefore, maintain *E. elatus* Greene for

the plant he described, treating the seeming source of the name, *E. alpinus*, var. γ . *elatus* Hooker, as inadequately defined and, therefore, not adequately published. Doubtless some extremely literal botanists will view the matter differently!

As I just now interpret the representatives of *Erigeron* § *Trimorphaea* ("just now" because any treatment is unsatisfactory and tentative) in temperate eastern North America, they may be distinguished by the following key.

- a. Peduncles glandular-pruinose or viscid; involucre bracts glabrous or nearly so, glandular or viscid; inflorescence an elongate raceme or thyrsiform to corymbiform panicle of (4-)7-80 heads on stiffly spreading-ascending peduncles; involucre 5-8 mm. high; stems 2-8 dm. high. 1. *E. elongatus*.
- a. Summits of peduncles and involucre bracts copiously hispid or villous, glandless; stems 0.2-4.5 dm. high. b.
- b. Cauline leaves narrowly linear; heads 1-70, on erect peduncles; no filiform pistillate flowers between the marginal ligulate and the perfect central flowers. Stems 1-4.5 dm. high; leaves scattered up the stem into the inflorescence; some of the 3-70 peduncles in the axils overtopped by the leaves. 2. *E. lonchophyllus*.
Stems 0.2-1.3 dm. high; leaves crowded at base, the cauline reduced to tiny linear bracts; heads 1 or 2 (rarely 3), terminating the scapiform stem
- 2a. *E. lonchophyllus*, var. *laurentianus*.
- b. Cauline leaves linear-oblong, lanceolate or oblanceolate; heads 1-8, on elongate flexuous or arching peduncles; filiform pistillate flowers forming a ring between the ligulate and the perfect tubular central flowers. Involucre 5-9 mm. high, of 20-36 bracts, the outer bracts $\frac{1}{2}$ -nearly equaling the inner; disks of leading heads 0.8-1.5 cm. broad. 3. *E. elatus*.
Involucre 7-12 mm. high, of 36-60 bracts, the outer mostly about equaling the inner; disks of leading heads 1.5-2 cm. broad. 3a. *E. elatus*, var. *oligocephalus*.

1. *E. ELONGATUS* Ledeb. Ic. Fl. Alt. i. 9, t. 31 (1829). *E. droebachensis* sensu Am. botanists, perhaps not *E. droebachensis* O. F. Muell. in Fl. Dan. v. fasc. xv. t. dccclxiv (1782), chance binomial in polynomial volume, validated by Fries, Summ. Veg. Scand. 183 (1846). *E. glabratus* Hook. Fl. Bor.-Am. ii. 18 (1834), not Hoppe. *E. acris*, var. *asteroides* sensu DC. Prodr. v. 290 (1836), based on the doubtful *E. asteroides* Andr. *E. acris* and var. *droebachensis* at least in sense of Gray, Syn. Fl. N. Am. i². 219, 220 (1884). *E. yellowstonensis* A. Nels. in Bot. Gaz. xxx. 198 (1900). *E. lapiluteus* A. Nels. in Coult. & Nels. Man. Bot. Rocky Mts. 530 (1909).—Damp banks, open sands, thickets and clearings, Hamilton River, Labrador Peninsula to Alaska, south to Anticosti Island and Gaspé Peninsula, Quebec, northern New Brunswick, northern Maine, northern Michigan, Manitoba, Saskatchewan, Colorado, Utah and Oregon; northern Eurasia.—An involucre, $\times 2$, is shown in FIG. 4.

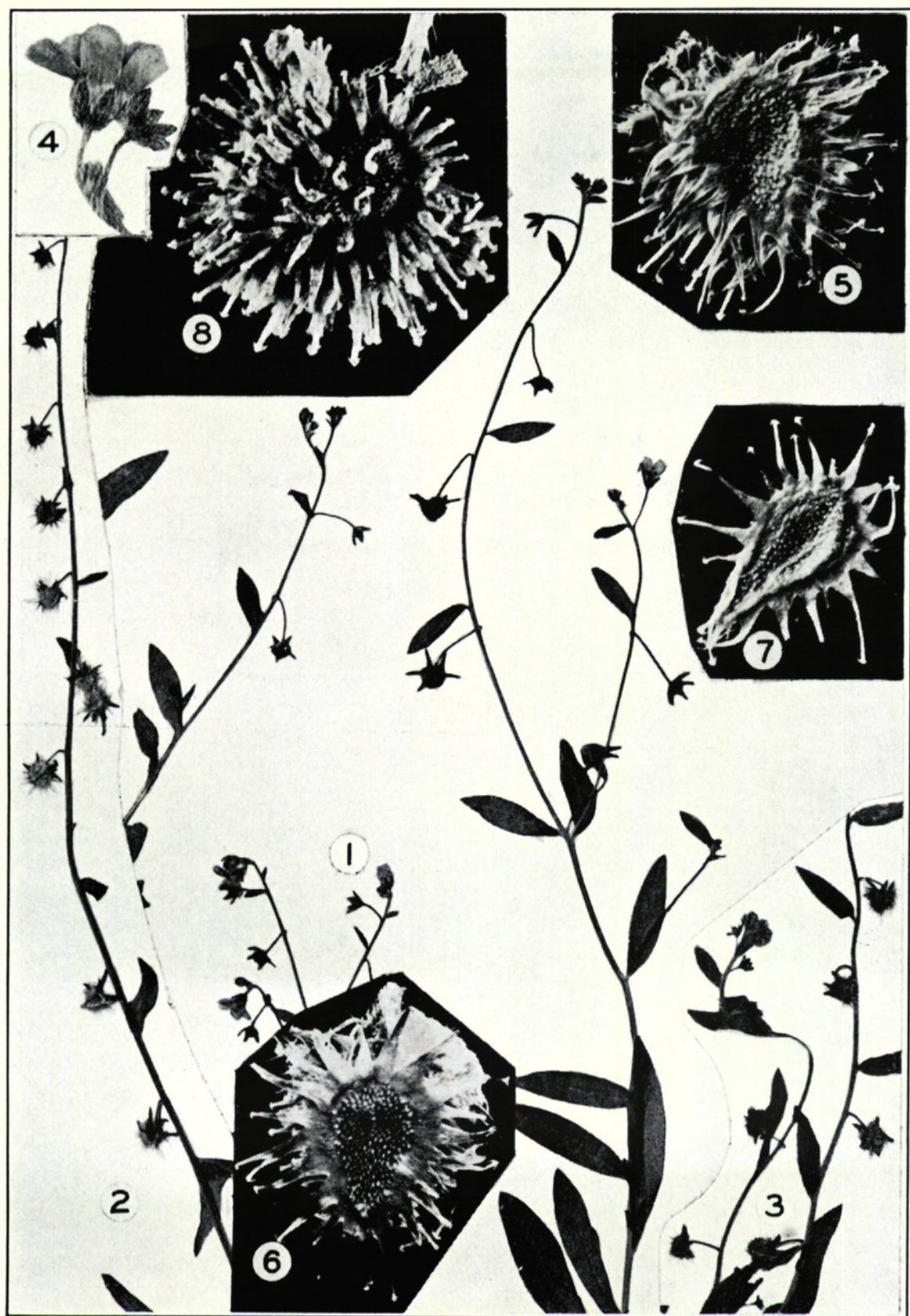


Photo. H. G. Fernald.

HACKELIA DEFLEXA: FIG. 1, portions of plants, $\times 1$, from Torne Lappmark; FIG. 2, fruiting branch, $\times 1$, from the Altai; FIG. 3, branches, $\times 1$, from Bohemia; FIG. 4, flower, $\times 4$, from Torne Lappmark; FIG. 5, fruit, $\times 8$, from Songaria; FIG. 6, fruit, $\times 8$, from Switzerland; FIG. 7, nutlet, $\times 8$, from Norway.

H. VIRGINIANA: FIG. 8, fruit, $\times 8$, from Massachusetts.



Photo. H. G. Fernald.

- ERIGERON ELATUS: FIG. 3, head, $\times 2$.
E. ELATUS, var. OLIGOCEPHALUS: FIG. 1, one of TYPE-SPECIMENS, $\times 1$; FIG. 2, head, $\times 2$.
E. ELONGATUS: FIG. 4, head, $\times 2$.
E. ACRIS: FIG. 5, head, $\times 2$.
E. BOREALIS: FIG. 6, head, $\times 2$.

2. *E. LONCHOPHYLLUS* Hook. Fl. Bor.-Am. ii. 18 (1834). *E. armeriifolius* Turcz. ex DC. Prodr. v. 291 (1836); *E. armeriaefolius* Gray in Proc. Am. Acad. viii. 648 (1873) and Syn. Fl. N. Am. i². 220 (1884), change of spelling. *E. racemosus* Nutt. Trans. Am. Phil. Soc. n. s. vii. 312 (1841).—Calcareous gravels, meadows and ledges, Mingan Islands and Anticosti Island, Quebec; Yukon and Alaska to South Dakota, New Mexico and California; Asia.

2a. Var. *LAURENTIANUS* Victorin in Trans. Roy. Soc. Can. ser. 3, xx. (sect. v). 476 (1926).—Mingan Islands, Anticosti Island and adjacent mainland of Saguenay County, Quebec.

3. *E. ELATUS* Greene, Pittonia, iii. 164 (1897). *E. acris*, var. *oligocephalus* Fern. & Wieg. in RHODORA, xii. 226 (1910), excluding type. *E. acris*, var. *arcuans* Fern. in RHODORA, xxviii. 236 (1926).—Calcareous shores, gravels and turf, River Ste. Anne des Monts, Gaspé County, Quebec; northeastern Manitoba (Churchill) to Mackenzie, south in the Rocky Mountains of Alberta and British Columbia. An involucre, $\times 2$, is shown in FIG. 3.

3a. Var. *OLIGOCEPHALUS* (Fern. & Wieg.) Fernald. *E. acris*, var. *oligocephalus* Fern. & Wieg. in RHODORA, xii. 226 (1910), as to type. *E. borealis* sensu Fernald in RHODORA, xxviii. 236 (1926), not (Vierh.) Simmons (1913).—Calcareous slopes, Labrador, easternmost Saguenay County, Quebec (Blanc Sablon, formerly included in Labrador) and northern Newfoundland. FIG. 1 shows one of the type-specimens, $\times 1$; FIG. 2, an involucre, $\times 2$.

As already pointed out, a specimen from somewhere in the Canadian Rocky Mountain region given to Gray by Hooker, as belonging to his inadequately published *Erigeron alpinus*, γ . *clatus*, is near if not quite *E. clatus*, var. *oligocephalus*. In 1926, accepting the identification by students of the Scandinavian and Greenland floras, I treated the plant of Labrador and Newfoundland as *E. borealis*. Abundant material of the latter plant of northern Europe and Greenland now shows it to be only slightly and perhaps not satisfactorily separable from the European *E. alpinus*. In its more ligneous rhizome, its firm and consistently small cauline leaves, its usually solitary erect head, its more villous involucre, its comparatively broad and conspicuous ligules and its double pappus *E. borealis* is quite distinct from *E. clatus* and its var. *oligocephalus*. A head of the Swedish *E. borealis* is shown, $\times 2$, in FIG. 6. *

ERIGERON RAMOSUS (Walt.) BSP., forma **discoideus** (Robbins), comb. nov. *E. strigosus* Muhl., var. *discoideus* Robbins ex Gray, Man. ed. 5: 237 (1867). *E. ramosus*, var. *discoideus* (Robbins) BSP. Prelim. Cat. N. Y. Pl. 27 (1888).

AMBROSIA TRIFIDA L., forma **integrifolia** (Muhl.) comb. nov.

A. integrifolia Muhl. in Willd. Sp. Pl. iv. 375 (1805). *A. trifida*, β . *integrifolia* (Muhl.) Torr. & Gray, Fl. No. Am. ii. 290 (1842).

THE VARIETIES OF *BIDENS CORONATA* (PLATE 506).—*Bidens coronata* (L.) Britton, the plant which long passed by the later name *B. trichosperma* (Michx.) Britton (not the strictly southern *B. mitis* (Michx.) Sherff, which long passed erroneously as *B. coronata*) has four well defined geographic varieties. As treated by Sherff in his *Genus Bidens*, pt. 1: 221 (1937) only two varieties are recognized:

“Foliola plerumque lanceolato-lineararia et inciso-dentata,
 achaeniis corpore 5–7 mm. longis. *B. coronata* sensu stricto.
 Foliola (segmentave) angustissime lineararia et saepe etiam
 integra, achaeniis minoribus. Var. β . *tenuiloba*.”

According to Sherff's treatment var. *tenuiloba*, based by Gray on material from Indiana and Illinois, occurs “With the species proper and usually commoner.”

When, however, we attempt to place specimens with lanceolate leaf-segments and achenes 9 mm. long, others with lanceolate segments and achenes 4.5 mm. long we become puzzled; when, furthermore, plants with linear segments only 1 mm. broad have achenes 7.5 mm. long, the inadequateness of present treatments of the species becomes more apparent. I am accordingly proposing the following treatment which recognizes four fairly defined geographic varieties.¹

¹ The geographic segregates within the species and the geographic ranges in general would have been more evident if Sherff had followed the conventional geographic sequence in citation of specimens. To most users of a monograph the arrangement of cited specimens in a familiar geographic sequence is of far greater importance than the mere citation of specimens in alphabetical sequence of collector's names. The latter is a secondary item; the former records a fact usually of permanent significance. Without a logical geographic sequence in citation grave errors enter the generalizations. For instance, on his p. 315 Sherff gives the range within the United States of *Bidens laevis*: “From New Hampshire and Massachusetts southward along the coast to Florida and westward from Florida to California.” From this generalization one would never guess that *B. laevis* grows in western New York and in West Virginia. Neither of these areas is “along the coast” nor “westward from Florida to California.” Nevertheless, under the cited specimens one from Cayuga Marshes, New York comes between specimens recorded from Argentina and from Rhode Island, merely because the Argentina plant was distributed in the series, *Chloris Platensis Argentina*, the New York plant was collected by Clinton and the Rhode Island specimen seen was from Congdon. The West Virginia specimen cited is lost in five pages of geographically disorganized matter under the name *Guttenberg*.

Handel-Mazzetti has already protested this unscientific method of citing specimens (Oesterr. Bot. Zeitschr. lxxxvii.² 154) and he specially protests the incorrect entering under V of the Germanic prefix “von.” He might have noted also that ubiquitous and unidentifiable collector “anon.” whose specimens are recorded in this sequence: Pennsylvania, Hawaii, and North Carolina. Every experienced taxonomist with whom I have conferred has urged the protesting of this novel method of citation.

a. Longest central achenes 6–9 mm. long.

Awns of central achenes 2.8–3.7 mm. long; larger outer achenes 5–6 mm. long, with awns mostly 2–2.6 mm. long; larger leaf-segments 4–20 mm. broad; outer involucre loosely ascending or spreading; plant of the interior

B. coronata, var. *typica*.

Awns of central achenes 0.6–1.8 mm. long; larger outer achenes 3.7–6 mm. long, with awns 0.6–1 mm. long; larger leaf-segments 1–12 mm. broad; outer involucre appressed-ascending. Var. *brachyodonta*.

a. Longest central achenes 4.5–6 mm. long; larger leaf-segments 1–12 mm. broad.

Ligules 1.5–2.5 cm. long; awns of central achenes 1–2 mm. long; larger outer achenes 3–5.2 mm. long, with awns 0.4–1.6 mm. long; plants of the interior. Var. *tenuiloba*.

Ligules 1.2–1.7 cm. long; awns of central achenes 1.8–3 mm. long; larger outer achenes 4.7–6 mm. long, with awns 1.5–1.8 mm. long; plant of Atlantic states. Var. *trichosperma*.

B. coronata (L.) Britton, var. **typica**. Figs. 4 and 5. *Coreopsis coronata* L. Sp. Pl. ed. 2, ii. 1281, as to descr. and specimen matching it in Herb. L. (1763). *Diodonta coronata* (L.) Nutt. in Trans. Amer. Phil. Soc. ser. 2, vii. 360 (1841). *B. coronata* (L.) Britton in Bull. Torr. Bot. Cl. xx. 281 (1893); Sherff in Bot. Gaz. lvi. 495 (1913) and Gen. Bidens, pt. 1: 221, in part, t. lix., figs. *m.* and *p-u* (1937).—Prairies, swales and rich bottoms, Connecticut Valley, Connecticut to southern Ontario and Nebraska, south to Delaware Valley, New Jersey, Pennsylvania, Ohio, Indiana and Illinois.

Var. **brachyodonta**, var. nov. (TAB. 506, FIG. 1–3), foliorum segmentis linearibus vel anguste lanceolatis 1–12 mm. latis; involucri exterioribus 4.5–10 mm. longis, interioribus 5.5–7 mm. longis; ligulis 1.5–2.8 cm. longis; achaeniis exterioribus 3.7–6 mm. longis 1.9–2.4 mm. latis aristis 0.6–1 mm. longis; achaeniis centralibus longioribus 6–7.5 mm. longis 1.2–1.8 mm. latis aristis 0.6–1.8 mm. longis.—Bogs and peaty swamps, Essex County, Massachusetts to Delaware. The following, from a large series, are characteristic. MASSACHUSETTS: swale near Pilling Pond, Lynnfield, October 21, 1917, *Fernald*; wet sphagnous clearing near Chebacco Lake, Essex, September 11, 1913, *Fernald*, *Hunnewell & Long*, no. 10,690; black spruce bog, North Reading, August 31, 1932, *W. B. Drew*; Fresh Pond, Cambridge, September 3, 1853, *Wm. Boott*; wet meadows of Neponset River, Dedham, September 6, 1901, *Day & Fernald* in Pl. Exsicc. Gray. no. 48 (as *B. trichosperma*); Broad Meadows, Needham, September 13, 1891, *T. O. Fuller*; Lakeville, September 25, 1903, *E. W. Hervey*; open swamps, Easton, October 18, 1919, *C. F. Batchelder*; swamp, Raynham, September 15, 1923, *Cheever & Knowlton*; boggy meadows near Fresh Pond, Dennis, September 2, 1918, *Fernald*, no. 17,612; cranberry bogs, Harwich, October 13, 1918, *Fernald*, no. 17,613 (TYPE in Gray Herb.). RHODE ISLAND: South Kingston, 1850, *S. T. Olney*. NEW YORK: Merricks, Long Island, September 8, 1916, *House*. DELAWARE: high

ground near Newport, New Castle County, September 9, 1899, *Canby*.

With the exception of var. *typica* in the Connecticut Valley, var. *brachyodonta* is the one variation of *Bidens coronata* in New England and apparently the only one on Long Island. It is presumably in New Jersey, since *Canby* collected it in Delaware. Its leaf-segments vary rather indiscriminately, even in the same colonies, from narrowest linear to lanceolate. Its achenes are nearly as large as in var. *typica* but the awns are strikingly shorter.

Var. **TENUILOBA** (Gray) Sherff in Bot. Gaz. lxxxvi. 446 (1928). FIGS. 6 and 7. *Coreopsis trichosperma* Michx., var. *tenuiloba* Gray, Syn. Fl. N. Am. i². 295 (1884). *B. trichosperma*, var. *tenuiloba* (Gray) Britton in Bull. Torr. Bot. Cl. xx. 281 (1893).—Bogs and swales, southern Ontario to Minnesota, south to Ohio, Indiana, Illinois, Iowa and Nebraska.

Although var. *tenuiloba* has been treated as merely a narrow-lobed and small-fruited phase of *Bidens coronata*, it should be noted that its leaf-segments are highly variable and may be quite like those of var. *typica*. The original material which Gray had before him showed such range of variation in the foliage; but its achenes are shorter than in var. *typica* and their awns are very much shorter. The series seems to be a reasonably defined variety and, singularly enough, its counterpart is on the coastal plain from New Jersey to Florida, which shows in length of awns a closer approach to var. *typica* of the interior. The latter plant is

Var. **trichosperma** (Michx.) comb. nov. FIGS. 8 and 9. *Coreopsis trichosperma* Michx. Fl. Bor.-Am. ii. 139 (1803). *B. trichosperma* (Michx.) Britton in Bull. Torr. Bot. Cl. xx. 281 (1893).—Bogs and swamps, New Jersey and eastern Pennsylvania to Florida. The following, from among many sheets, are typical. NEW JERSEY: Moonachie, September 21, 1901, *E. E. Magee*; Woodbridge, September 21, 1889, *J. R. Churchill*. PENNSYLVANIA: wet soil, Tullytown, September 20, 1930, *W. M. Benner*. VIRGINIA: tidal marsh, Capitol Landing, Queen's Creek, Charles City County, *Grimes*, no. 4291; border of tidal marsh along Gray's Creek, near Cross Creek Landing, south of Swann Point, *Fernald & Long*, no. 6909 (see FIG. 8); Northwest, Norfolk County, *Heller*, no. 1247. GEORGIA: swamp of Satilla River, near Woodbine, Camden Co., *Harper*, no. 1562 (see FIG. 9).

Var. *trichosperma* is, if the slight representation in the Gray Herbarium from Virginia southward can be taken as indicative, the only variation of *Bidens coronata* in the Southeast. In its very short



Fernald, Merritt Lyndon. 1938. "CONTRIBUTION FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY—NO. CXXII: VIII. NEW SPECIES, VARIETIES AND TRANSFERS (Concluded)." *Rhodora* 40, 331–358.

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