

it, as did also Aristotle and many others. Here, for instance, is a quotation of which an up-to-date polar-front enthusiast well might be proud; it is in explanation of the squall storm and reads as follows: "Here the colder polar current finds in its way an equatorial current nearly saturated with vapor. As it proceeds, shoving like a wedge over the surface beneath the equatorial current, it forces it upward. The equatorial current, growing colder from below and above, commences to condense its vapor, to evolve heat, and increase, therefore, its upward motion by its own action." This (and there is a lot more equally good) did not first appear in the latest work on the subject, but in the New York *Daily Times* of November 18, 1852, and again in Appendix A to a fair sized book by William Blasius published in 1875.

After this came the mathematical basis for wind movements and storm genesis by Helmholtz, Margules and V. Bjerknes, now hidden by the great and growing superstructures of everyday practical meteorology. And judging from the keen and active interest everywhere shown in the subject in all countries it is safe to assume that there is more worth-while history of meteorology in the next few decades than has been produced by all the centuries of the past.

BOTANY.—*Lepidonia*, a new genus of *Vernonieae*, with a nomenclatorial note on the name *Leiboldia*.<sup>1</sup> S. F. BLAKE, Bureau of Plant Industry.

In 1891 the late J. M. Coulter described *Vernonia salvinae* var. *canescens*, based on *von Tuerckheim* 583 from Coban, Guatemala, distinguishing it from *V. salvinae* Hemsl. by the "dense pannose tomentum" of the lower leaf surface. In his revision of North American *Vernonieae*, in 1906, Gleason placed Coulter's variety as a doubtful synonym of the rare and little known *Leiboldia mexicana* (Less.) Gleason (*Vernonia mexicana* Less.) because of its agreement in leaf pubescence, stating that he had seen no specimen of it. In his later treatment of the same tribe in the North American Flora, Gleason, although still separating *Leiboldia* from *Vernonia* by the same key character as in his earlier treatment, put *Leiboldia salvinae* and *L. mexicana* back in *Vernonia* and retained *V. salvinae canescens* Coulter as a doubtful synonym of *V. mexicana*.

In the United States National Herbarium there is a sheet of the type collection of *Vernonia salvinae* var. *canescens* Coulter from the

<sup>1</sup> Received August 15, 1936.



Fig. 1.—*Lepidonia paleata* Blake. *a*, branch,  $\times 1/2$ ; *b*, corolla,  $\times 2$ ; *c*, two anthers,  $\times 5$ ; *d*, style  $\times 5$ ; *e*, immature achene,  $\times 5$ ; *f*, part of pappus bristle,  $\times 10$ ; *g*, pale,  $\times 3$ ; *h*, *i*, and *j*, outermost, middle, and innermost phyllaries,  $\times 3$ .

herbarium of the late Capt. John Donnell Smith. Examination of this specimen shows that the plant is not only quite distinct specifically from *V. salvinae* as well as (from description) *V. mexicana* Less., but that it represents an undescribed genus of Vernoniaceae, nearly related to *Vernonia* but distinguished at once by its paleaceous receptacle. Coulter overlooked the remarkable nature of the receptacle, but it was noticed by Capt. Smith, who has written on the sheet: "*V. Salvinae* aff., receptacle paleaceous as in figure of that species; but leaves canescent beneath, and involucre apparently different." Capt. Smith's reason for assimilating it to *V. salvinae* in respect to the receptacle was that in the original illustration of that species, although the receptacle is shown as naked in Fig. 1, in the explanation of the plate Fig. 2, which represents one of the inner phyllaries, is labeled "a palet." The error is corrected in a letter to Smith from W. B. Hemsley which is attached to the sheet.

*Lepidonia* Blake, gen. nov.

Suffrutescens (?); caulis densissime pilosus; folia alterna magna obovata petiolata penninervia serrulata supra viridia pilosa subtus dense canescenti-tomentosa, nervis rufidulo-pilosis; capitula homogama discoidea majuscula ad apicem caulis pauca, pedunculis foliis brevioribus solitariis 1-2-cephalis. Involucrum hemisphaericum valde gradatum ca. 8-seriatum phyllaria exteriora (ca. 5-seriata) parva ovata infra indurata pallida 1-costata appendice brevi herbacea lanceolata v. ovata plus minusve squarrosa praedita, interiora lineariblonga crasse chartacea subnervia sub appendice tenuiore subscariosa ovata apiculata 1-3-nervia paullum angustata. Receptaculum latum rotundatum, paleis linearibus stramineis persistentibus planiusculis ubique onustum. Flores omnes hermaphroditi fertiles, corollis infundibuliformibus alte 5-dentatis. Stamina 5, basi alte sagittata auriculis obtusis, apice appendice ovata munita. Styli infra ramos hispiduli rami lineari-subulati dorso hispiduli. Achenia (immatura) obovoidea valde 5-6-costato-angulata glabra truncata, apice paullum incrassata et 5-6-nodosa. Pappi decidui setae plurimae pluriseriatae inaequales gradatae conformes subcapillares hispidulo-barbellatae.—Species typica *L. paleata* (*Vernonia salvinae* var. *canescens* Coult.)

*Lepidonia paleata* Blake, nom. nov.

*Vernonia salvinae* var. *canescens* Coult. Bot. Gaz. 16: 95. 1891.

Caulis (vel ramus) dense sublanato-pilosus pilis brunneis; petioli 1-2 cm longi, sicut caulis pubescentes; folia obovata 16-21.5 cm longa 6-7.5 cm lata breviter acuminata basi longe cuneata mucronulato-serrulata supra viridia subdense breviter pilosa pilis tenuibus basi paullum incrassatis aliis paucioribus longioribus multiloculatis intermixtis glabrescentia, subtus tenuiter sed persistenter canescenti-tomentosa in pagina et densius in venis majoribus rufidulo-pilosa submembranacea penninervia, nervis ca. 10-jugis in ambabus paginis prominulis; pedunculi terminales et subterminales ut videtur extra-axillares sicut caulis pubescentes 4.5-6 cm longi nudi v.1-

foliati 1–2-cephali; involucri 7–8 mm alti 1.3–1.5 cm lati (in sicc.) phyllaria exteriora in basi indurata margine breviter pilosulo excepto subglabra, in appendice foliacea basem subaequante v. multo brevior dense pilosula, interiora (1.3–1.8 mm lata) in appendice sessili-glandulosa et obscure ciliolata ceterum glabra; corollae 10.5–12 mm longae glanduloso-adsersae, tubo cylindrico sursum infundibuliformi 5.8–7.5 mm longo, faucibus ca. 1 mm longis, dentibus lineari-lanceolatis apice recurvatis 3.5–3.8 mm longis; paleae receptaculi lineari-lanceolatae acuminatae rigidae stramineae obscure ciliolatae sparse strigillosae 5–7.5 mm longae; achenea valde immatura olivacea glabra 1.8 mm longa; setae pappi stramineae 1.5–3 mm longae.

GUATEMALA: In very deep shady woods ("in tiefsten Waldesschatten"), near Coban, alt. 1460 m., March 1881, von *Tuerckheim* 583 (type collection: U. S. Nat. Herb. no. 1,401,303).

As the name *canescens* is already in use in *Vernonia*, it seems desirable, in raising this plant to specific rank, to give it a new and distinctive name. The generic name is derived from *λεπίς*, *scale*, and *Vernonia*.

Until recently only two genera of Vernonieae with truly paleaceous receptacle had been described—*Heterocoma*, of Brazil, and *Bolanosa*, of Mexico,—although alveolate, fimbriate, or setiferous receptacles are found in several genera. From both these *Lepidonia* differs decidedly in pappus as well as in other features. Its closest relationship, as shown by resemblance in habit, foliage, involucre, achene, pappus, and floral details, is with the small group of *Vernonia* centering around *V. salvinae*, from which it differs technically only in its paleaceous receptacle. This feature is such an unusual and significant one in the Vernonieae that it seems necessary to regard it as of generic value. The genus is to be inserted in the system next to *Vernonia*.

In Humbert's monograph on the Compositae of Madagascar two additional genera of Vernonieae with paleaceous receptacle are listed<sup>2</sup>—one *Diaphractanthus*, a new monotypic genus, not closely related to *Vernonia*, the other *Centauropsis*, a close relative of *Vernonia* and evidently even closer to *Lepidonia*. *Centauropsis*, an endemic Madagascar genus of 6 species, had previously been described as with naked receptacle, but Humbert states that the receptacle is paleaceous, and separates it from *Vernonia* by this feature. Bentham and Hooker, and following them O. Hoffmann, separate it from *Vernonia* by its acuminate-subcaudate anther bases, and the same character may be used to distinguish it from the geographically remote *Lepidonia*. I have not been able to examine any material of *Centauropsis*.

In his revision of North American Vernonieae in 1906 Gleason<sup>3</sup> recognized four genera (*Lachnorhiza*, *Leiboldia*, *Vernonia*, and *Eremosis*) in the genus *Vernonia* as understood by most authors, and in his later treatment in the North American Flora a fifth was added (*Cyanthillium*). None of these segregates, all of which were named by earlier authors, seem worthy of

<sup>2</sup> Mem. Soc. Linn. Normandie 25: 16, 17, 29. 1923.

<sup>3</sup> Bull. N. Y. Bot. Gard. 4: 154. 1906.



recognition. The invalidity of *Eremosia* as a genus I discussed<sup>4</sup> some years ago. The other genera are all distinguished from *Vernonia* by having their "pappus-bristles in one or more series, essentially uniform in length," in contrast with the "pappus in two series, the outer of scales or bristles and much shorter than the inner" of *Vernonia*. The three alleged genera are then separated by the following key:<sup>5</sup>

- |  |                           |
|--|---------------------------|
| "Leaves all basal.                                 | 4. <i>Lachnorhiza</i> .   |
| Leaves chiefly cauline.                            |                           |
| Stems woody; leaves densely tomentose beneath.     | 5. <i>Leiboldia</i> .     |
| Stems herbaceous; leaves thinly pubescent beneath. | 6. <i>Cyanthillium</i> ." |

The extreme inadequacy of such habitual characters as these as a basis for generic segregation is obvious, whether one considers intrageneric variation in the Asteraceae in general or the genus *Vernonia* (as left by Gleason) in particular; and comparison of Gleason's full descriptions of these so-called genera brings to light no further differences of any consequence. Moreover, the single pappus character by which they are separated as a group from *Vernonia* proves to be far from constant, and does not apply to some of the plants assembled under it. The contrast between the pappus of such a *Vernonia* as *V. argyropappa* Buek—conspicuously double, the inner of subequal capillary setae, the outer of several times shorter, linear squamellae—and that of *V. piloselloides* (A. Rich.) Maza (type of *Lachnorhiza* A. Rich.)—of similar, only slightly unequal, definitely but slightly flattened setae—is significant taxonomically and would, if reasonably constant throughout the group, suffice for the separation of genera. Unfortunately the transition between these two extremes is a very gradual one. Even in *V. piloselloides*, although nearly all the bristles are nearly of the same length (some essentially capillary, some slightly but distinctly flattened, and practically all with slightly dilated tips) there are usually a few shorter outer ones to be found, half or two-thirds the length of the inner, and in one case (a single bristle) only about one-tenth the length of the inner. In this species, as in most of the species of typical *Vernonia*, the pappus is decidedly persistent, so that achenes can be withdrawn from the head by its means. In the two other segregates recognized by Gleason, *Leiboldia* and *Cyanthillium*, particularly the latter, the pappus is so fragile and so readily deciduous that it is practically impossible, even with the greatest care, to withdraw from a dried specimen an achene with all its pappus in place for study. In *Vernonia patula* (Ait.) Merrill (*Cyanthillium chinense* (Lam.) Gleason)<sup>6</sup> the bristles

<sup>4</sup> Contr. Gray Herb. 52: 16-17. 1917.

<sup>5</sup> N. Amer. Fl. 33: 47. 1922.

<sup>6</sup> Gleason, N. Amer. Fl. 33: 51. 1922, cites *Conyza chinensis* Lam. as the type of *Cyanthillium* Blume and uses the name *Cyanthillium chinense* (Lam.) Gleason for the species that has generally been known as *Vernonia chinensis* (Lam.) Less. Blume (Bijdr. 889. 1826), when describing his genus, actually based it on three new species, *C. villosum*, *C. pubescens*, and *C. moluccense*, with no synonyms given. These are referred respectively by Koster (Blumea 1: 431-435. 1935) to *Vernonia patula* var. *typica*, var. *pubescens* (Blume) Koster, and *V. moluccensis* (Blume) Miq. The type

are in part essentially capillary, in part slightly but distinctly flattened, but without sharp differentiation in this respect. They are numerous and in one head examined varied from 1.8 to 3.5 mm in length, so that, although all essentially similar, they must be decidedly graduate, despite Gleason's characterization of them as "equal."

The segregate genus *Leiboldia* is particularly interesting in this connection. In his 1906 revision, Gleason regarded the genus as consisting of 4 species: *L. salvinae* (Hemsl.) Gleason, *L. mexicana* (Less.) Gleason, *L. leiboldiana* (Sch. Bip.) Gleason, and *L. serrata* (D. Don) Gleason. All, presumably, were supposed to have the pappus characteristic of the genus as distinguished from *Vernonia*—"in 2-3 series, capillary, its bristles all equal or nearly so, at least not in two unequal series." In his 1922 treatment, however, Gleason, although retaining the genus, with the same characterization, for *L. leiboldiana* and *L. serrata*, referred *L. salvinae* and *L. mexicana* back to *Vernonia*, and described the pappus of *V. salvinae* as "pale-tawny, the bristles 5 mm long, the scales subulate, very deciduous, 0.8-1.1 mm long." He does not give a detailed description of the pappus of *V. mexicana*, but Lessing had originally characterized it as "setaceus, flavescens, multiserialis, inaequalis, linea parum longior." I have seen no material of *V. mexicana*, and am unable to distinguish, in the material examined, the two supposed species *Leiboldia leiboldiana* and *L. serrata* (for which I adopt<sup>7</sup> the name *V. arctioides* Less.). In this species, although the pappus is fragile, it is possible to obtain achenes with sufficient pappus in place to show its nature well enough. In *Pringle* 6085, listed under *L. leiboldiana* by Gleason in 1906, the pappus consists of numerous, white, for the most part slightly but distinctly flattened and not "capillary" bristles, and these are distinctly in two groups—the outer 2.4-5 mm long, the inner subequal, 9 mm long, and with decidedly flattened tips. No bristles really intermediate in length were observed. That is, the pappus in this species is quite as "biseriate" as in ordinary *Vernonia*, although the outer series is longer than usual and not differentiated as to breadth from the inner. As for the last point, lack of differentiation between the inner and outer series of the pappus, except in regard to length, is by no means uncommon in *Vernonia* and is particularly mentioned by Gleason in some species, for instance *V. fasciculata*, *V. marginata*, *V. tenuifolia*, and *V. corymbosa*. In *V. salvinae*, which Gleason now refers to *Vernonia*, describing the bristles as 5 mm long, the scales as

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species of Blume's genus should be cited as *Cyanthillium villosum* Blume, not as *Vernonia chinensis*. Merrill (Philipp. Journ. Sci., ser. C. Bot. 3: 439. 1909) has shown that the valid name for the species generally called *Vernonia chinensis* (Lam.) Less. is *Vernonia patula* (Ait.) Merrill, since *Conyza chinensis* of Lamarck, on which Lessing's name was based, is different from the earlier *Conyza chinensis* L. Lamarck's species was not described as new but was ascribed to Linnaeus, and is merely a misidentification of Linnaeus' plant. Merrill attributes the name-bringing synonym *Conyza patula* to Dryander, but it seems better to follow general usage and attribute this as well as other names in Aiton's *Hortus Kewensis* to Aiton, the nominal author.

<sup>7</sup> In Standl. Contr. U. S. Nat. Herb. 23: 1412. 1926.

subulate, very deciduous, 0.8–1.1 mm long, I find a pappus quite different from his description or from that just described for *V. arctioides*. In *E. W. Nelson* 3747 the pappus is pale brown, readily deciduous, and made up of very numerous, similar, capillary to distinctly flattened and often longitudinally somewhat twisted setae, and these vary very regularly in length from the innermost (7 mm) to the outermost (1 mm), without any recognizable hiatus. This agrees very closely with Lessing's description (quoted above) of the pappus in *V. mexicana*. It appears, then, that the species (*V. salvinae* and *V. mexicana*) at first included in *Leiboldia* by Gleason but later referred by him to *Vernonia* are the only ones that even approach agreement with his character of the genus, and that the species (exemplified by *Pringle* 6085) retained in the genus by him is in much closer agreement with ordinary *Vernonia*. *Vernonia lankesteri* Blake, the Costa Rican relative of *V. salvinae*, agrees closely with the latter in its pappus.

Such differences as are shown by the pappus of the plants discussed above do not seem to be of generic value. Species in different groups of the genus *Vernonia* show much variation in respect to the presence or absence of the outer pappus, and its character when present (compare the accounts of the genus in Bentham & Hooker and in Engler & Prantl). The situation was well summarized by Bentham & Hooker:<sup>8</sup> "Pappi exterioris absentia minime valere videtur, nam in speciebus nonnullis setae exteriores in diversis achaeniis ejusdem paniculae adsunt paucae v. omnino desunt, et in speciebus finitimis quoad copiam valde differunt, dum paucae saepius caducis-simae sunt."

A note on the status of the generic name *Leiboldia* is added.

#### NOMENCLATORIAL NOTE ON THE NAME LEIBOLDIA

The name *Leiboldia*, although first used by Schlechtendal in 1847, was not given effective publication until Gleason's paper of 1906. Schlechtendal<sup>9</sup> described "*Vernonia Leiboldiana* n. sp. (s. *Leiboldia ovata*)."<sup>9</sup> In his discussion of the species, on the following page, he remarked: "Species haec arcte affinis est *V. arctioidi* (*Leiboldia arctioides*) a Lessingio optime descriptae . . ." After describing the differential characters of the fruit and pappus in these two species, he added: "Hinc generis novi proposui nomen vel sectionis, naturalis modo ex tota planta hauriendae, nec modo artificiali e paucis characteribus in genere tam diversissimas formas continente petendae." The translation of this sentence offers some difficulty; but, on the assumption that the first "modo" is the adverb and not the ablative of "modus," and that "naturalis" is not an error for "naturali," it may be rendered: "Hence I have proposed the name of a new genus or section, natural only if drawn from the whole plant, not to be sought in an artificial

<sup>8</sup> Gen. Pl. 2: 228. 1873.

<sup>9</sup> Linnaea 19: 742. 1847.

way from a few characters in a genus containing such extremely varied forms."

*Leiboldia* is thus one of those half-published names which have always been a source of uncertainty and annoyance. Its printed appearances, on the pages cited, are only in synonymy, and its author's remark that he proposed it as the name of "a new genus or section" does not clarify the situation. By the "American Code" (Art. 10), under which Dr. Gleason was working on both occasions (1906 and 1922) when he used the name, *Leiboldia* could be regarded as properly published in 1847, since it was associated with a specific description and a binomial specific name. Under the "International Rules," as amended at the Amsterdam meeting (1935) (known to me only from T. A. Sprague's brief summary in Kew Bull. 1936: 185), the status of *Leiboldia* as first used in 1847 depends upon whether it is considered to have been used then as a "provisional name" (these are not regarded as validly published) or an "alternative name" (these are regarded as validly published). The question is complicated by the fact that the generic name in question (*Leiboldia*) does not stand by itself at all. The name *Leiboldia ovata* is certainly, in the most literal meaning of the word, an "alternative name" ("s." = seu or sive, or), and so, obviously is *Leiboldia arctioides*. In so far, by the letter of the law, these names are validly published. But is a genus *Leiboldia* published at the same place? And, if not, can specific names be validly published under a genus which has no technical existence?

It seems fairly clear that the generic name *Leiboldia*, under the International Rules, was not effectively published by Schlechtendal in 1847. The "genus or section" was based on two species, hence does not come under Art. 43 of the "International Rules" (1930) permitting the validation of the names of monotypic new genera by a combined generic-specific description. (The fact that I have been unable to distinguish the two supposed species, and so combine them under the name *V. arctioides*, does not alter the situation nomenclatorially.) Articles 40 and 41, so far as they go, do not indicate that it was validated; and Art. 42 appears to rule it out definitely. "The name of a genus is not validly published unless it is accompanied (1) by a description of the genus, or (2) by the citation of a previously and effectively published description of the genus under another name, or (3) by a reference to a previously and effectively published description of the genus as a subgenus, section or other subdivision of a genus." (Art. 42, Int. Rules, Cambridge, 1930.) Provisions (2) and (3) do not apply in this case. As to (1), there is certainly no generic description as such. Schlechtendal gives a fairly full description of the achene and pappus of *V. leiboldiana* in his account of that species, then states that the achene of *V. arctioides* differs in some respects, and goes on to say (translated) "This structure of the fruit strongly departs from that to be found in other Vernonias, where for example the achene is marked with longitudinal pilose sulci and alternate glabrous ones, or where series of pappus of diverse character crown the



achene. Hence I have proposed the name of a new genus or section, etc." (as above cited). This is certainly not a generic description in any proper sense. Although the names *Leiboldia ovata* and *L. arctioides* are published as "alternative names," the generic name *Leiboldia* itself is not. It is merely a suggested name for a "new genus or section," in which its own author did not have enough confidence to use it except in a subordinate way, and must consequently be regarded as a "provisional name" and thus not validly published. This being the case, the two "alternative" specific names made under it can have no better standing.

Bentham and Hooker<sup>10</sup> recognized *Leiboldia* as a section of *Vernonia* and gave a brief description. Curiously enough, they cited the name as of "Schlecht. ex Walp. Ann. i.: 388. Sch. Bip. in Liebm. Comp. exs. n. 478." In Walpers' *Annales*, at the page cited, Schlechtendal's description of *Vernonia leiboldiana* is copied under that name with the synonym added "*Leiboldia ovata* Schlecht. mss." Schultz Bipontinus' manuscript use of the name, in Leibmann's *exsiccatæ*, is of course not publication in any sense.

The first valid publication of *Leiboldia* as a genus was by Gleason<sup>11</sup> in 1906. The genus was described, with the type designated as *Vernonia leiboldiana* Sch. Bip., and 4 species were keyed and described. Unfortunately the genus and the two specific names previously made under it were all ascribed to Schultz Bipontinus, an error corrected in Gleason's 1922 treatment in the *North American Flora*. This being a self-evident error, it seems justifiable to cite the genus as of Schlechtendal ex Gleason, in view of the references given by Gleason.

PALEOBOTANY.—*A fossil shelf-fungus from North Dakota.*<sup>1</sup>

ROLAND W. BROWN, U. S. Geological Survey.

The Hell Creek formation, of Upper Cretaceous age, exposed at a number of localities along the Cannonball River in southwestern North Dakota, yielded only a few species of fossil plants to the writer during the field season of 1931. These remains consist chiefly of poorly preserved dicotyledonous leaves, and the twigs and cones of *Sequoia dakotensis* Brown.<sup>2</sup> The fragment to be described here as a fossil shelf-fungus was found 1 mile southwest of the old post office called Wade, in sec. 36, T. 131 N., R. 86 W. The identity of this specimen was, until recently, unsuspected; but the publication of a somewhat similar species, *Polyporites browni* Wieland<sup>3</sup> from the Lower

<sup>10</sup> Gen. Pl. 2: 228. 1873.

<sup>11</sup> Bull. N. Y. Bot. Gard. 4: 161. 1906.

<sup>1</sup> Published by permission of the Director, U. S. Geological Survey. Received May 4, 1936.

<sup>2</sup> BROWN, ROLAND W. *Some fossil conifers from Maryland and North Dakota*. This JOURNAL 25: 447. 1935.

<sup>3</sup> WIELAND, G. R. *A silicified shelf fungus from the Lower Cretaceous of Montana*. Am. Mus. Nov. 725: 1-13. 1934.