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U. S. GEOLOGICAL AND GEOGRAPHICAL SURVEY OF THE TERRITORIES.

F. V. HAYDEN, U. S. GEOLOGIST-IN-CHARGE.

MISCELLANEOUS PUBLICATIONS—No. 4.

10
SYNOPSIS

OF THE

FLORA OF COLORADO,

BY

THOMAS C. PORTER

AND

JOHN M. COULTER.

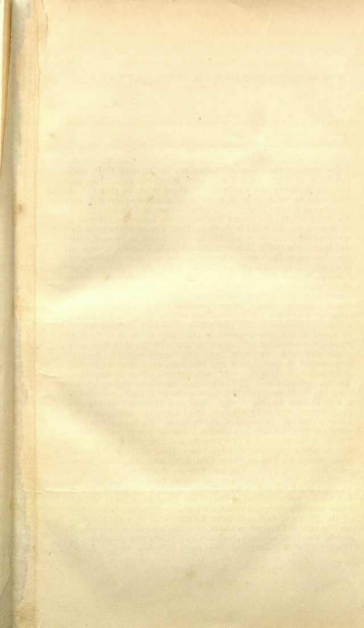
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Dr. Engelmann

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Synopsis of the Flora of Colorado; by THOMAS C. PORTER and JOHN M. COULTER. Washington, March 20, 1874. 8vo, pp. 180.—A prefatory note by Dr. F. V. Hayden states that this is "intended to be a type of a series of handbooks of different branches of natural history . . . for the use of students all over the country." In the proper preface, which takes the form of a "Letter to the geologist-in-charge," Prof. Porter enumerates the various collections on which the work is based, as Parry's, Hall and Harbour's, Bell's, Hayden's, Brandegee's, Porter's, Coulter's, etc.; but omits Dr. Vasey, whose collection was among the largest of all, although no list was published. "The plan followed in the Synopsis is that of Mr. Watson in his excellent catalogue, vol. v of Clarence King's Report," giving characters of such orders, genera and species as are not included in the several floras of the Cis-Mississippi region. After returning suitable thanks to the botanists who have aided the authors of this Synopsis, the writer adds: "References to the authorities consulted and used are to be found at the proper places in the body of the work." The Synopsis enumerates about eleven hundred (1104?) flowering plants, and about two hundred and eighteen cryptogams. Several new species of phænogams are proposed, as *Clematis Scottii*, *Astragalus Brandegei*, *Astr. scopulorum*, *Rosa Arkansana*, *Erigeron glandulosum*, *E. Coulteri* and *Senecio renifolius*, besides a couple of Mosses (by Mr. Lesquereux from Hall's collection), and a Fungus by Mr. Peck. Hall and Harbour's plants are generally referred to by numbers, and Parry's are sometimes; but a search through the pages of the Synopsis fails to discover any reference to Dr. Vasey's collection. Among plants collected by Vasey in the mountains of Colorado, and altogether omitted in this Synopsis are *Aster Canbyi* Vasey (No. 262); *Aplopappus lanceolatus*, var. *Vaseyi*, Parry (No. 273), and *Artemisia arbuscula* Nutt. (No. 308). The last two are described in Watson's report, to which it will presently appear that the authors constantly turned for assistance. The characters given to the genera and species not contained in Gray's and Chapman's floras will be found exceedingly useful to students and collectors. Very many of the plants of Colorado have hitherto been described only in various rare and expensive works, or in the transactions of learned societies, so that ordinary students had practically no means of identifying their collections. It is much to be regretted, however,

that the writers of this Synopsis have by no means made the "references to authorities consulted and used" which it is said in Dr. Porter's letter that they have made. For example: the generic characters of *Brickellia*, *Townsendia*, *Machoranthera*, *Gutierrezia*, *Bigelovia*, *Aplopappus*, *Grindelia*, *Franseria*, *Helio-meria*, *Chanactis*, *Bahia*, *Tetradymia*, *Stephanomeria*, *Crepis*, *Macrorrhynchus*, *Orthocarpus*, *Monardella*, *Gilia*, *Collomia*, *Mirabilis*, *Abronia*, *Sarcobatus*, *Calochortus*, *Lloydia*, *Leucocri-num*, *Vaseya*,* *Eriocoma*, *Pleuraphis* and *Beckmannia* are taken with no alterations, save those incidental to inaccurate copying (e. g., *Bahia*), from Mr. Watson's report, and with no word of acknowledgment in any instance. Even when, as in the cases of *Cercocarpus*, *Cleome*, *Tellima*, *Gayophytum*, *Jamesia*, etc., the reference "Benth. and Hook." is given, the writers have copied Bentham and Hooker only from Mr. Watson's sometimes amended and always modified translations. To make this plainer yet: in *Cercocarpus* Bentham and Hooker say, "cotyledones lineari-elongatae, radícula" Watson says, "elongated cotyle-dons, and inferior radicle." The authors of the Synopsis copy Watson's words here, as elsewhere, and indeed there is no evidence that they have ever even seen the original Latin! The same dis-ingenuous borrowing appears most copiously also in the specific characters. To quote any considerable portion of the instances were a tedious task; the following examples will suffice. *Thlaspi alpestre*, *Claytonia Chumissonis*, *Cercocarpus parvifolius* (an error in measurement is the only change), *Sedum rhodanthum*, *Brickellia Californica*, *Solidago Guiradonis* and its variety, *Solidago pumila*, *Franseria Hookeriana*, *Antennaria alpina*, etc. These are examples of exact copying. The instances where the copying is as real, though the wording is slightly varied, are much more numerous. One cannot but wish, for the honor of American Botany, that when Dr. Porter said that "the plan followed in the Synopsis is that of Mr. Watson," he had added, "and much of the descriptive matter is also taken from the same work."

DANIEL C. EATON.

NEW HAVEN, April 3d, 1874.

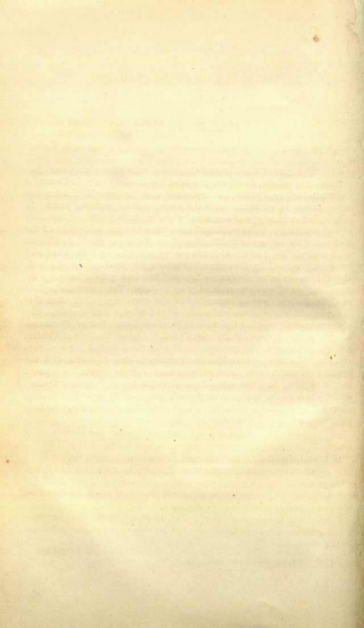
* *Vaseya comata* Thurber; Colorado, Vasey No. 634. This species surely might have been credited to Vasey.

PREFATORY NOTE.

The "Synopsis of the Flora of Colorado," which the survey now presents to the public, has been prepared by Prof. Thomas C. Porter, of Lafayette College, Easton, Pennsylvania, and Mr. John M. Coulter, one of the assistants connected with the survey for the past two years. It is intended to be a type of a series of "handbooks" of different branches of natural history, to be published from time to time as a part of the series of "Miscellaneous Publications," for the use of students all over the country. No. 3 of the series is now passing through the press, and has been prepared by the eminent ornithologist, Dr. E. Cones, U. S. A. It will form an octavo volume of several hundred pages, bringing the whole subject of western ornithology up to date. The mountain regions of Colorado are now so accessible to the traveling public, that this synopsis will prove a most valuable aid to students, and travelers who can, are annually visiting Colorado in great numbers. Indeed, the mountainous portions more nearly resemble the Alpine districts of Central Europe, not only in the scenery, but also in the different forms of vegetation. The tide of travel is fast turning in this direction, and the demand for works of this kind will necessarily be very great. It should be stated here, that the obligations of the survey to Professor Porter, for his share in the work, are very much increased from the fact that he occupied several months in its preparation without compensation from the Government.

F. V. HAYDEN,
United States Geologist.

OFFICE UNITED STATES GEOLOGICAL AND GEOGRAPHICAL
SURVEY OF THE TERRITORIES, *January 14, 1874.*



LETTER TO THE GEOLOGIST-IN-CHARGE.

LAFAYETTE COLLEGE,
Easton, Pa., January 15, 1874.

SIR: In lieu of a simple list of the plants obtained in Colorado during the explorations of last summer, I have the honor to present you herewith a condensed Synopsis of the Flora of the Territory, prepared in conjunction with Prof. John M. Coulter of the Survey.

The work is based chiefly on collections made, in 1861 and succeeding years, by Dr. C. C. Parry, whose indefatigable labors have added so much to our knowledge of the flora of the region; in 1862, by Messrs. Hall and Harbour; in 1867, by Dr. W. A. Bell, of Manitou Springs; in 1868, by Dr. F. V. Hayden; in 1869, by B. H. Smith, Esq., of Denver; in 1871, by Dr. George Smith and W. M. Canby, Esq.; in 1871 and 1873, by Messrs. Meehan and Hooper; in 1872, by J. H. Redfield, Esq.; in 1872 and 1873, by T. S. Brandegee, Esq., of Cañon City, Rev. E. L. Greene, of Pueblo, and T. C. Porter; and in 1873, by J. M. Coulter.

The plan followed in the Synopsis is that of Mr. Watson in his excellent Catalogue, volume V of Clarence King's Report. Descriptions are given of all the orders, genera, and species not contained in Gray's Manual, Chapman's Flora, and other botanies of the States east of the Mississippi River.

For the elaboration of the *Musci* and *Hepaticæ* we are greatly indebted to Leo Lesquereux, Esq., of Columbus, Ohio; of the *Lichens*, to Henry Willey, Esq., of Amherst, Mass.; and of the *Fungi*, to Charles H. Peck, Esq., of Albany, N. Y.

Thanks are due also to Dr. Gray and S. Watson, Esq., of Cambridge, Mass., and Dr. George Thurber, of New York City, for kindly assistance in the determination of difficult and doubtful species; and to J. H. Redfield, esq., of Philadelphia, for valuable services rendered.

To Mr. Brandegee, for his large and fine collections from the southern part of the Territory, and to the Rev. E. L. Greene, for lists and specimens of rare species, we are under special obligations.

References to the authorities consulted and used are to be found at the proper places in the body of the work.

I regret that circumstances have prevented the completion of an introductory article on the geographical distribution of the plants embraced in this synopsis.

THOS. C. PORTER.

Dr. F. V. HAYDEN, *U. S. Geologist.*

ADDITIONS.

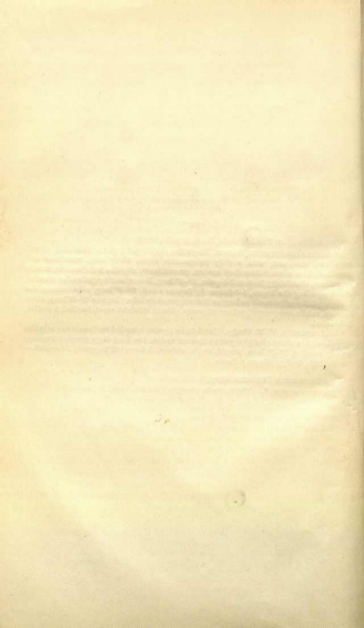
After *ASTRAGALUS KENTICOPHYTA*, Gray, page 30, insert—

ASTRAGALUS VEGETARIUS, Watson, *King's Rep.*, vol. 5, p. 76, pl. 13. Perennial, dwarf caespitose, caespitose, with a silky pubescence; stems 2'-6" long, numerous and branched, from a much-branched caudex, procumbent; stipules membranous, mostly acuminate, sheathing; leaflets 3-5 pairs, 2'-3" long, linear, acute; peduncles slender, about equaling the leaves, 1-3-flowered; flowers small, 2'-3" long, ochroleucous, the keel purplish; calyx-teeth as long as the campanulate tube; legume 2'-3" long, chartaceous, sessile, compressed, pubescent, ovate, oblong, straight, erect, 1-celled, 6-ovuled, 1-2-seeded.

Var. \dagger *IMPLEXUS*, W. M. Canby. Leaflets in 2 pairs, crowded on the stems; stipules tipped with a short straight point; flowers violet, the keel deep purple; legumes mostly smaller, 1'-2" long, turgid, ovate, obtuse, 3-4-ovuled, 1- (rarely 2-) seeded.—South Park, Canby; Hoopes; Porter.

After *ZYGADENUS NUTTALLII*, Gray, p. 133, insert—

VERATRUM ALBUM, L.—Middle Park, Parry. \triangle
South Park \triangle



CORRECTIONS.

- Page 5. For "BERBERIS AQUIFOLIUM," put "B. AQUIFOLIUM."
19. For "RHUS TOXICODENDRON," put "RHUS TOXICODENDRON."
32. For "*A. Lathyris*," (ninth line from bottom,) put "*A. Lathyris*."
42. For "RIBES FLORIDUM, L'Her.," put "RIBES FLORIDUM, L."
46. For "*Æ. Nuttallii*, T. & G.," (sixth line from top,) put "*Æ. Nuttallii*, Torr."
50. For "*O. brevistyla*," (eighth line from top,) put "*O. brevistyla*."
63. For "SOLIDAGO LANCEOLATA, T. & G.," put "SOLIDAGO LANCEOLATA, L."
70. For "HELIOPSIS LAEVIS, Pursh," put "HELIOPSIS LAEVIS, Petr."
94. For "MIMULUS FLORIBUNDUS, Gr.," put "MIMULUS FLORIBUNDUS, Dougl."
94. For "DC. Prod. 10, p. 1, 331," (sixth line from bottom,) put "DC. Prod. 10, p. 331."
114. For "ACERTES DECUMBENS," put "ACERATES DECUMBENS."
118. For "Dumort.," after SUEDA MARITIMA, put "Dumort."
124. For "SHEPHERDIA CANADENSIS, L.," put "SHEPHERDIA CANADENSIS, Nutt."
127. For "HUMULUS LUPULUS," put "H. LUPULUS."
130. For "PINUS ARISTATA, Engelm, DC. Prod., l. c., p. 400," put "PINUS BALFOURIANA, Murr., (*P. aristata*, Engelm.)"
136. For "MONTANUS," (third line from the top,) put "MONTANUS."
140. For "var. MINOR, Olney," put "var MINOR, Boott."
157. For "ORTHOTRICHUM HALLII, Sully. & Lesqx.," put "O. HALLII, Sull. & Lesqx."
160. For "var. *S. alpinum*," (ninth line from top,) put "var. *S. alpinum*."
161. For "ENGYRIUM," (first line at top,) put "EUGYRIUM."
161. For "CTEIDIUM," (thirteenth line from bottom,) put "CTEINIDIUM."
163. For "ENDOCOCCUS," put "ENDOCOCCUS."
163. For "AGARICUS LACCATUS, Scap.," put "A. LACCATUS, Scop."
164. For "LENZITES SEPIRIA," put "L. SEPIARIA."
164. For "PUCCINIA PORTERI," put "P. PORTERI."
164. For "Peck.," after PEZIZA VULCANALIS, put "Peck."

SYNOPSIS OF THE FLORA OF COLORADO.

RANUNCULACEÆ.

CLEMATIS DOUGLASHI, Hook. Stem simple, erect, 1°-2° high, 1-flowered, sparingly hairy, woolly at the joints; leaves hairy, 2-3 pinnatifid; sepals thick, deep purple within, paler externally, spreading at the apex, much longer than the stamens.—Common in the mountains at middle elevations.—*Hall & Harbour*, 2; *Dr. Smith*; *Meehan*; *Porter*; *Coulter*.

CLEMATIS SCOTTI, Porter (*n. sp.*) More or less villous, with soft, spreading hairs; bushy, branching from a suffrutescent base, branches erect, 9'-18', not climbing; leaves opposite on rather long petioles, pinnate; leaflets five pairs, ovate or lanceolate, acute or acuminate, petiolulate, strongly veined beneath, lower ones often 2-3 cleft; flowers axillary and terminal, nodding, peduncles 3'-4'; sepals 4, ovate, with reflexed summits nearly 1' long, dark or brownish purple, thickish but not leathery as in *C. Viorna*, more or less tomentose on the outside; carpels silky pubescent, with densely plumose tails 1'-1½' in length.—Named for Hon. John Scott, who collected it in 1872, at Soda Springs, 35 miles west of Cañon City. *Brandegee*, Fremont County, in fruit. *Redfield*. *AA*

CLEMATIS LIGUSTICIFOLIA, Nutt. Climbing, somewhat pubescent, flowers white, in paniculate corymbs, dioecious; leaves pinnate and ternate, (mostly 5-foliolate,) the coriaceous leaflets oblong, acute, mostly somewhat lanceolate-cuneate, incisely toothed and trifid; petals and stamens equal in length; carpels with long plumose tails.—Common along water-courses, at the base of the foot-hills, and ascending the ravines, climbing over bushes and producing a great abundance of white flowers.—*Hall & Harbour*, 3; *Dr. Smith*; *Porter*; *Redfield*. *Mountain etc.*

CLEMATIS ALPINA, Mill., var. **OCHOTENSIS**, Gr. *DC. Prod.*, 1, p. 10. Leaves biternately divided, segments ovate or oblong lanceolate, acuminate, frequently three-lobed, irregularly toothed; sepals 4, lance-ovate purplish blue; antheriferous petals linear.—A trailing, woody-stemmed plant, 6' high, nearly glabrous; carpels glabrous; tails 1½' long, very finely plumose.—Georgetown, *Dr. Smith*. Chiann Cañon, *Porter*. Clear Creek Cañon, at 9,000 feet altitude, *Coulter*.

THALICTRUM ALPINUM, L. Stem simple, 2'-8' high, slightly pubescent, scapiform; leaves mostly radical, 2-3 ternate; leaflets roundish, about ½' long, somewhat lobed, crenately toothed; flowers perfect, nodding in a simple raceme; pedicels slender; sepals 4, oblong; stigmas thick and pubescent; carpels ovate, sessile.—In damp, mossy ground, at 9 to 10,000 feet altitude, rare. *Hall & Harbour*, 10. Cache Creek, near Granite, *Porter*.

THALICTRUM PURPURASCENS, L. Anthers rather shorter than in eastern specimens.—Cañon City and Wet Mountain Valley, *Brandegee*. Foot-hills along the Platte River, June 28, *Coulter*. In flower.

THALICTRUM SPARSIFLOREM, Turcz. (*T. clavatum*, Hook., not of DC.) 1°-2° high; panicle loosely few flowered, long-pedicelcd, flowers

perfect; filaments clavate; anthers elliptical, pointless; ovaries 8-10; carpels compressed, dimidiate, ~~not~~-striate, thrice shorter than the persistent style; upper leaves sessile, 2-3 ternate, leaflets often small. Subalpine.—*Hall & Harbour*, 9; *Parry*, 1872.

THALICTRUM FENDLERI, Eng. *Plant. Fendl.*, p. 5. Dioecious, glabrous; leaves petioled, or the uppermost sessile; leaflets round-cordate, 3-lobed; filaments scarcely thickened at the apex; anthers long mucronate; carpels sessile, obliquely ovate, compressed, sharp-edged, with 4-6 strong lateral ribs, three times longer than the recurved style. In other respects like *T. Cornuti*.—Common in the mountains at middle elevations.—*Hall & Harbour*, 8; *Dr. Smith*; *Canby*; *Brandege*; *Parry*; *Porter*; *Coulter*. On Mount Elbert, near Twin Lakes, at 12,000 feet altitude.

ANEMONE PATENS L., var. *NUTTALLIANA*, Gr.—On the plains and extending up into the mountains. *Hall & Harbour*, 4; *B. H. Smith*; *Meehan*; *Parry*; *Porter*; *Coulter*. Gray's Peak, at 12,000 feet altitude *Redfield*.

ANEMONE CAROLINIANA, Walt.—*Hall & Harbour*, 6. On the plains.

ANEMONE PARVIFLORA, Michx.—Near Mount Lincoln, July 15, *Coulter*.

ANEMONE MULTIFIDA, DC.—Found in the mountains at middle elevations and upward. *Hall & Harbour*, 5; *B. H. Smith*; *Porter*; *Parry*; *Coulter*.

ANEMONE CYLINDRICA, Gr.—Green Horn Mountains, June, 1873, *Brandege*. Idaho Springs, *Redfield*.

ANEMONE PENNSYLVANICA, L. Common in the foot-hills. *Dr. Smith*; *B. H. Smith*; *Meehan*; *Brandege*; *Coulter*. Colorado Springs, *Redfield*.

ANEMONE NARCISSIFLORA, L. Villous, leaves palmately 3-5 parted, segments cuneiform, incisely many-cleft, lobes linear, acute; involucre somewhat similar, sessile, leaflets 3-5 cleft; pedicels several, umbel, leafless, 1-flowered; flowers white; carpels without tails, much compressed, roundish oval, glabrous.—Alpine. *Hall & Harbour*, 7; Mount Lincoln at 13,500 feet altitude, July 9, *Coulter*.

MYOSURUS MINIMUS, L.—South Park, *Hall & Harbour*, 20.

RANUNCULUS AQUATILIS, L., var. *TRICHOPHYLLUS*, Chaix.—Common in stagnant or slow-flowing waters in the foot-hills. *Brandege*; *Coulter*.

Var. *STAGNATILIS*, DC. (*R. divaricatus*, Schrank.)—Ponds and slow streams at middle elevations. *Dr. Smith*; *Brandege*; *Coulter*.

RANUNCULUS ALISMÆPOLIUS, Geyer, var. *MONTANUS*, Watson. Low, 6' high, alpine, stems ascending, leaves entire; carpels rather shorter-beaked than usual in the species.—*Parry* 79; *Vasey* 15. Sierra Madre Range, *Coulter*.

RANUNCULUS FLAMMULA, L., var. *REPTANS*, Gr.—*Hall & Harbour*, 18.

RANUNCULUS GLABERRIMUS, Hook. Very glabrous; stems 1 (sometimes 2) from a root of thickened fasciculated fibers, few-flowered, 3-5' high; radical leaves elliptical, variable in breadth, tapering into long, slender petioles, mostly entire, rarely cleft, cauline leaves sessile, usually 2-3 cleft; peduncles 1-flowered, those of the axils elongated and divaricate; flowers 6' broad; petals obovate, twice as long as the sepals; heads of carpels globose; achenia with a short curved beak, puberulent, resembling those of *R. affinis*. This seems to be the plant referred to by *Dr. Gray* in his Enumeration of *Hall and Harbour's* col-

lection in the note attached to No. 19.—Near Long's Peak, June 1, at 9,000 feet altitude, *Coulter*.

RANUNCULUS CYMBALARIA, Pursh.—Common in marshy ground on the plains and in the mountains. *Hall & Harbour*, 11; *Dr. Smith*; *B. H. Smith*; *Porter*; *Brandegee*; *Coulter*.

RANUNCULUS AFFINIS, R. Br. Radical leaves petioled, usually pedately multifid; cauline ones subsessile, digitate, with broadly linear lobes; stem erect, few-flowered; carpels with recurved beaks in oblong cylindrical heads, more or less pubescent throughout. Var. **LEIOCARPUS**, Trautv. Lower leaves usually lobed or crenate; from 8'-12' high; flowers small; carpels smooth or somewhat pubescent.—*Hall & Harbour*, 15; *Vasey*, 13; *B. H. Smith*; *Porter*; *Coulter*.

Var. **CARDIOPHYLLUS**, Gr. (*R. cardiophyllus*, Hook.) Hirsutely pubescent, radical leaves round-cordate, undivided or many cleft; cauline ones palmately many-cleft; flower 1' in diameter.—*Hall & Harbour*, 16.

RANUNCULUS NUTTALLII, Gr. (*Cyrtorrhynca ranunculina*, Nutt. *Fl. N. Am.* 1, p. 26.) *Gray's En. Hall & Harbour*, p. 56. Note. Smooth, 6'-8' high; root fasciated; radical leaves biternately divided, segments 3-5 parted, lobes oblong or linear, sometimes 2-3 cleft; branches subtended by a small leaf, few-flowered; petals spatulate, yellow, a little longer than the broader sepals, which are also yellow, thickened above the base; style long, slender, incurved; carpels rather few, collected into a globose head, glabrous, cylindrical-oblong, grooved, many-nerved; stigma subulate.—*Hall & Harbour*, 13. Near Long's Peak, June 1, at 9,000 feet altitude, *Coulter*.

RANUNCULUS SCCELERATUS, L.—Platte River, *Hall*. Cherry Creek, *Dr. Smith*. Bear Creek Cañon, *Coulter*.

RANUNCULUS MULTIFIDUS, Pursh., var. **REPENS**, Hook. Creeping; leaves all round-reniform, palmately 3-5 cleft.—Wilson's Creek, July, *Brandegee*.

RANUNCULUS HYPERBOREUS, Rottb., var. **NATANS**, C. A. Meyer. Stem filiform, creeping; leaves glabrous, petioled, 3 cleft; lobes oval-oblong, divaricate, the lateral ones somewhat 2 cleft, middle one entire; sheaths bi-auriculate at base; heads of carpels globose, compact; style wanting.—Much resembles forms of the preceding, but distinguished by the absence of styles.—In swamps at middle elevations. *Hall & Harbour*, 12. Clear Creek, *Coulter*.

RANUNCULUS PYGMEUS, Wahl. Stem erect, never creeping, 1'-2' high, 1-flowered; leaves glabrous, 3-5 cleft; radical ones petioled, cauline ones sessile; calyx glabrous, longer than the somewhat reflexed petals; heads oblong; carpels subglobose, not margined at the back, pointed with a short hooked style.—Mount Evans, on dry ground, at 13,000 feet altitude, *Greene*.

RANUNCULUS NIVALIS, R. Br., var. **ESCHSCHOLTZII**, Watson. (*R. Eschscholtzii*, Schlecht.) Radical leaves 3-parted, the divisions lobed, ciliate; stem about 1-flowered; calyx hirsute, with whitish hairs, shorter than the petals; style shorter than the achenia.—*Hall & Harbour*, 14; *Vasey*, 17; *Parry*.

RANUNCULUS ADONEUS, Gr. *Gray's En. Pl. Hall & Harbour*, p. 17. Note. Low, sparsely villous, becoming glabrous; root fasciculate, fibrous; stems branching from the base, 1-3 leaved above, sometimes erect, very simple, 1-flowered, but sometimes sarmentose-decumbent, and 2-3 flowered; leaves twice pedately parted, segments narrowly linear; petioles scarious, base dilated; peduncle short; corolla golden-yellow, often ex-

ceeding 1' in diameter; petals flabelliform, twice exceeding the sub-villous oval sepals; basilar scale small, adnate; achenia crowded in an oval head, smooth, turgid; beak rather long, ensiform, scarious-winged on each side.—In the high alpine region, close to the snow, *Hall & Harbour*, 17; *Parry*. Chicago Lakes at 12,000 feet altitude, June, *Coulter*. Gray's Peak, 13,000 feet, *Redfield*.

RANUNCULUS REPENS, L.—*Meehan*; *Greene*; *Porter*.

RANUNCULUS PENNSYLVANICUS, L.—Platte River near Denver, *Dr. Smith*. Wet Mountain Valley, *Redfield*.

CALTHA LEPTOSEPALA, DC. Stem 1-leaved or naked, mostly 1-flowered, erect, 3'-1^o high; radical leaves on long petioles, ovate-cordate, obscurely crenate; sepals 8-10, oblong, white or tinged with blue; style short and recurved; stigma obtuse; carpels 8-10, oblong.—Very abundant in subalpine swamps. An excellent pot-herb. *Hall & Harbour*, 21; *Parry*; *Meehan*; *Brandege*; *Coulter*. May to September.

TROLLIUS LAXUS, Salisb.—Associated with the preceding, but less common.—*Hall & Harbour*, 22; *Brandege*; *Coulter*. Gray's Peak, *Redfield*. June and July.

AQUILEGIA VULGARIS, L., var. BREVISTYLA Gr. (*A. brevistyla*, Hook.) Stems low, 6'-8' high, spreading; leaves bi-ternate; leaflets 3-lobed, crenate, 6'-9' long, crenatures ovate, rotund; flowers small, blue, about 6' long including the spur; sepals oblong-ovate; petals a little exceeding the stamens; spurs hooked at the tip; styles shorter, included.—*Hall & Harbour*, 23. Mountains near Pike's Peak, *Canby*; *Meehan*.

AQUILEGIA CANADENSIS, L. Styles longer than the stamens.—Along subalpine rivalets. Mount Elbert near Twin Lakes, *Porter*. La Plata Mountain at 11,000 feet altitude, July, *Coulter*.

AQUILEGIA CÆRULEA, Torr. *Ann. N. Y. Lyc.* 2, p. 164. Spur straight, very slender, 1½'-2'; sepals rhomboid-ovate, acute, longer than the petals; stamens and style shorter than the corolla; stem 1^o-3^o high, glabrous, few-flowered; flowers 2'-2½' in diameter, pale blue, sometimes ochroleucous, pinkish or white. Leaves mostly radical, glaucous beneath; leaflets deeply cleft.—On shaded mountain-slopes from 7-11,000 feet altitude. A very beautiful and showy plant in flower. June to September. *Hall & Harbour*, 24; *Parry*; *Dr. Smith*; *Porter*; *Coulter*. Gray's Peak, *Redfield*.

AQUILEGIA CHRYSANTHA, Gr. *Proc. Am. Acad.* 8, p. 621, (*A. leptocera*, Nutt., var. *flava*, Gr. *Pl. Wright*, 2, p. 9.) Smaller than the former and more slender in stems and foliage; peduncles often pubescent; flowers deep yellow, spurs more slender; sepals about 9' long, lanceolate-oblong, longer but not broader than the limb of the petals.—Grand Cañon of the Arkansas, June 3, *Brandege*.

DELPHINIUM ELATUM, L., var. (?) OCCIDENTALE, Watson. *King's Rep.*, vol. 5, p. 11. Tall, 5^o high, glabrous or densely pubescent above; leaves deeply 3-5 cleft, divisions broadly embeate, somewhat 3-lobed and sparingly gashed-toothed, the teeth narrowing abruptly to a callous point; racemes many-flowered, often densely so, simple or paniced; flowers pubescent, sometimes white; spur longer than the sepals; lower petals broad, slightly notched, often erosely-dentate, more or less densely bearded, the claw spurred at base.—In *Coulter's* specimens from the Twin Lakes the spur is shorter than the sepals and the lower petals are very acute; stems very stout; flowers large, in crowded racemes.—*Hall & Harbour*, 25; *Coulter*.

DELPHINIUM SCOPULORUM, Gr. *Pl. Wright*, 2, p. 9. Puberulent or glabrous; stem leafy, simple, 1°-2° high; petioles dilated at base; leaves orbicular in outline, 3-5 parted, divisions deeply 2-3-cleft, segments many-lobed or lacinate; raceme strict; many-flowered; flowers smoothish; spur longer than the sepals; lower petals bifid, sparingly bearded within; claw spurred at base; carpels 3, erect, nearly glabrous.—Wet Mountain Valley, *Brandegee*. *Hall & Harbour*, 26.

VAR? Stems 2°-3° high, stout, panicled; racemes slender, elongated; flowers scattered, small; spur straight, ascending.—Ute Pass, *Porter*. Wet Mountain Valley, *Brandegee*.

DELPHINIUM AZUREUM, Michx.—Cañon City, June 26, *Brandegee*.

DELPHINIUM MENZIESII, DC. More or less pubescent; stems stout, 1°-2° high, leaves orbicular in outline, 5-7 parted, divisions 2-3 cleft; bracts mostly entire, lower ones 3-cleft; raceme simple, few to many-flowered; spur usually curved, longer than the sepals, ascending; capsules glabrous; root gumous. Closely resembles the eastern *D. tri-corne*.—*Hall & Harbour*, 28. In the foot-hills west of Denver, *Coulter*.

ACONITUM NASUTUM, Fisch. Petals erect, with the spur arcuate; galea conical, prone; spur descending; raceme somewhat panicled; divisions of the leaves rather broad, coarsely lacinate-toothed. Stem stout, 3°-6° high, pubescent above; flowers purple or white.—*Hall & Harbour*, 29; *Parry*. Weston's Pass, July 18, at 11,000 feet altitude, *Coulter*.

ACTÆA SPICATA, L., var. **ARGUTA**, Torr. (*A. arguta*, Nutt. *Fl. N. Am.*, p. 35.) Stoutier than *A. spicata*, var. *rubra* of Gray's Manual; leaflets larger and more serrated; petals oblong, obtuse; otherwise nearly the same.—Mountains near Denver, *Dr. Smith*. Oak Creek, Fremont County, *Brandegee*. St. Vrain Cañon, *Coulter*.

BERBERIDACEÆ.

BERBERIS ^{*repens* L.} **AQUIFOLIUM**, Pursh. Leaflets 1-6 pairs, not approximated to the base of the petiole, coriaceous, ovate-lanceolate or elliptical oblong, oblique and slightly cordate at base, margin repand with thorny or spinulose cuspidate teeth; racemes short, nearly erect, clustered; filaments 2-toothed; berries dark purple.—An under-shrub 2°-5° high, branching, the branches often procumbent. Leaflets 1½'-3' long, obscurely reticulated on both sides, the veins all rising from the midrib.—*Hall & Harbour*, 30. Head-waters of the Arkansas, *Porter*. Near Long's Peak, *Coulter*.

NYMPHÆACEÆ.

NUPHAR POLYSEPALUM, Eng. *Proc. Saint Louis Acad.*, April 17, 1865, p. 282. Leaves broadly ovate, deeply cordate, with a narrow sinus; sepals 9-12, concave, the middle ones very large; petals 12-18, spatulate, retuse; stamens very numerous; anthers truncate, appendiculate at the apex, equaling or shorter than the at-length recurved filaments; stigmatic rays of the striate, urceolate ovary 13-21, almost reaching the crenate margin of the umbilicate disk, neither constricted nor beaked toward the apex.—Leaves longer in proportion to their breadth than those of *N. advena*; sinus narrower and more closed; flowers very large; outer sepals greenish and yellowish, inner ones more or less tinged with red.—Mountain-lakes around Long's Peak, *Parry*. Cold Lake in the Sierra Madre Range, at 10,000 feet altitude, *Coulter*.

PAPAVERACEÆ.

PAPAVER ALPINUM, L. Scape one-flowered, 2'-3' high, naked, hispid as well as the calyx with brownish hairs; leaves lance-ovate in outline, deeply pinnatifid, divisions rarely incised; flower nodding in the bud, 6"-8" in diameter; petals lemon-yellow; capsule obovate, hispid. Nearest var. *flaviflorum*, Koch. *Fl. Germ.* 1, p. 25.—Alpine. *Hall; Parry, 147; Meehan.* California Gulch at 12,500 feet altitude, *Coulter.*

ARGEMONE MEXICANA, L. Most common on the plains along the foot-hills. Stout, 2^o-3^o high; flowers large, 2'-3' in diameter, white, very rarely yellow.—*Hall; Dr. Smith; B. H. Smith; Porter; Coulter.*

montana Eng. FUMARIACEÆ.

CORYDALIS AUREA, L., var. CURVISILIQUA, Eng.—Common in the mountains. *Dr. Smith; B. H. Smith; Canby; Porter; Coulter.*

CRUCIFERÆ.

NASTURTIUM OFFICINALE, R. Br.—Platte River near Denver, *Dr. Smith.* Golden City, *Greene.*

NASTURTIUM SINUATUM, Nutt.—Platte River near Denver, *Dr. Smith.*

NASTURTIUM OBTUSUM, Nutt.—*Hall & Harbour, 32; Porter.* Oro City, *Coulter.*

NASTURTIUM PALUSTRE, D. C.—*Dr. Smith; Porter; Brandegee.* Near Denver, *Coulter; Redfield.*

ARIBIS HIRSUTA, Scop.—Common everywhere in Colorado. *Dr. Smith; Meehan; Brandegee; Coulter; Redfield.*

ARABIS DRUMMONDII, Gr.—Very variable; stem strict or slender and flexuous; glabrous or covered with a stellate pubescence; pods erect and straight or spreading and arcuate. *Dr. Smith; Coulter.*

var. ALPINA, Watson. A reduced alpine or subalpine form with a few crowded purple or white flowers; glabrous or stellately pubescent.—White House Mountain, August, at 11,000 feet altitude, *Coulter.*

ARABIS RETROFRACTA, Grah. (*Streptanthus angustifolius*, Nutt.) Stems several from one root, 12'-18' high, virgate, branching near the summit; radical leaves lanceolate, linear, sparingly hirsute, lower cauline much broader, closely amplexicaul, upper ones smaller, oblong-lanceolate, smooth, erect; flowers small, pale red; petals oblong-oval, the limb exserted; sepals short, smooth, almost coriaceous.—*Hall & Harbour, 35.*

CAEDAMINE CORDIFOLIA, Gr. *Pl. Fendl.*, p. 8. Stem 1^o-3^o high, erect, simple, from a fibrous, creeping rhizoma, glabrous or pilose at base, leafy to the top; leaves all petioled, cordate, sparingly repand-dentate or angular-toothed, ciliate, 2'-4' in diameter; lowest orbicular; the upper triangular-cordate, sub-acuminate; flowers rather large, white; siliques erect, 2 to 3 times longer than the pedicels.—Common in swamps at middle elevations. *Hall & Harbour, 34; Dr. Smith; Parry; Meehan; Coulter.* Sangre de Cristo Range, *Redfield.*

CAEDAMINE HIRSUTA, L.—*Hall & Harbour, 33.*

VESICARIA STENOPHYLLA, Gr. *Pl. Lindh.*, 2, p. 149. Low, branches several, spreading from a thick, woody caudex, a span or less high; leaves linear or linear spatulate, crowded; silvery pubescent, mostly entire;

raceme densely many-flowered; flowers golden yellow; silicle membranaceous, very smooth, equaling or a little longer than the style.—Cañon City, August 13, 1872, in fruit, *Brandegee*. Bluffs at Pueblo, *Greene*.

VESICARIA LUDOVICIANA, DC. Canescent with a stellate pubescence; stem 6'-8' high, simple or somewhat branched above; radical leaves spatulate, entire, obtuse, cauline linear; flowers golden yellow; petals obovate; style slender, longer than the ovary and nearly as long as the obovate, globose, hairy silicle.—Platte River near Denver, *Dr. Smith*; *Coulter*.

VESICARIA MONTANA, Gr. *Proc. Acad. Phil., March, 1863, p. 58*. Silvery canescent; stems spreading from a perennial root, leafy; leaves spatulate; the radical subovate, petioled, sometimes 1-2 toothed; fruiting raceme elongated, silicle oval or ellipsoidal, whitish-pubescent, a little longer than the slender style, a little shorter than the upwardly curving, spreading pedicel.—Well marked by the oval or oblong silicle, in some specimens 3" long but scarcely half that breadth, hoary with a fine stellate pubescence; seeds 4 or 6 in each cell, wingless; petals spatulate, light yellow; filaments filiform.—*Hall & Harbour, 49; B. H. Smith; Meehan; Porter*. Found in the mountains at middle elevations.

PHYSARIA DIDYMOCARPA, Gr. (*Vesicaria*, Hook.) Canescent with a stellate pubescence; radical leaves broadly obovate-spatulate, occasionally lyrate, cauline spatulate-lanceolate, mostly entire; siliques large, globose-didymous, deeply emarginate above and below.—A low, decumbent, profusely branched perennial. Flower showy; petals oblong-spatulate, exceeding the oblong sepals; silicles varying in size, the lobes usually approximate, sometimes considerably divergent; septum lanceolate.—*Hall & Harbour, 47; Dr. Smith; B. H. Smith*. Long's Peak, May 27, *Coulter*.

DRABA ALPINA, L. Rather rigid; scapes naked, mostly somewhat hirsute; leaves spatulate-lanceolate, plane, more or less pilose with branching hairs; petals yellow, more than twice the length of the calyx; silicles somewhat corymb, oblong-elliptical; style very short.—Dwarf, 1'-4' high; alpine and subalpine, very variable.—Mount Lincoln at 13,000 feet altitude, July, in flower, *Coulter*. Gray's Peak at 12,000 feet, *Redfield*.

DRABA AUREA, Vahl. More or less pubescent; stem erect, leafy; leaves lanceolate or ovate-lanceolate, entire or toothed; corymbs terminal and axillary; silicles oblong lanceolate, pubescent, exceeding the pedicels; petals yellow, emarginate; style rather short. Variable.—In the mountains from 7-14,000 feet altitude. *Hall & Harbour, 44; Dr. Smith; Meehan; Brandegee; Coulter*. Gray's Peak, *Redfield*.

DRABA STREPTOCARPA, Gr. *Sill Jour. 1862, vol. 33, p. 13*. A span high; radical leaves rosulate, spatulate-lanceolate, acutish, attenuated into a large-margined petiole, $\frac{3}{4}$ "-1 $\frac{1}{2}$ " long, cauline about $\frac{1}{2}$ ", oblong or oblong-lanceolate, very entire, sessile; hairs simple or simply forked, long, rigid, shaggy, spreading; racemes often paniculate, many-flowered; petals golden yellow, twice longer than the calyx, mostly retuse or emarginate; style a little shorter than the ovary; stigma emarginate, capitate; fructiferous pedicels 3" long, more or less spreading; silicles $\frac{1}{2}$ "- $\frac{3}{4}$ " long, linear or oblong-ovate, minutely or strongly hispid-ciliate, usually much twisted, turns often 3-4; style long, $\frac{1}{2}$ "-2".—Easily distinguished

¹ *PHYSARIA*, NOLL.—Character as in *Vesicaria*, except that the silicle is didymous, much inflated, membranaceous, and the cotyledons contrary to the narrow septum.

from *D. aurea*, which it most resembles, by its lack of stellular pubescence, longer styles and the more twisted silicles.—In the mountains from 7-14,000 feet altitude. Alpine forms much dwarfed. *Hall & Harbour*, 45; *Parry, Canby*; *Brandege*; *Coulter*.

DRABA CRASSIFOLIA, Grah. Scape naked or with a single leaf, 1'-3' high; leaves lanceolate-linear, entire or somewhat serrate, ciliate with simple hairs; calyx and pedicels glabrous; flowers small, yellow or white; petals a little exceeding the calyx, retuse; silicles ovate-elliptical, glabrous.—*Hall & Harbour*, 41. Sangre de Cristo Pass, *Brandege*.

DRABA NEMOROSA, L., var. *LUTEA*, Gr. (*D. lutea*, DC.) Pubescent; stem branching, leafy, 6'-15' high, very slender, sometimes branching from the base; pubescence simple or forked; leaves oval, cauline ones lanceolate, toothed; flowers very small, yellow; petals about twice as long as the calyx; style none; silicles oblong-elliptical, rather obtuse, glabrous, about 4' long, one-third to one-half the length of the slender spreading pedicels. Alpine and subalpine.—*Hall & Harbour*, 42. Sierra Madre Range at 11-13,000 feet altitude, *Coulter*.

Var. *ALPINA*, Porter. Dwarf, 2'-3' high, branching from the base; fruiting raceme short; flowers white; pedicels shorter than the silicles; stigmas distinctly 2-lobed.—Mount Lincoln, at 13,000 feet altitude, July, *Coulter*.

DRABA CUNEIFOLIA, Nutt.—Cañon City, *Brandege*.

SISYMBRIUM CANESCENS, Nutt. Very variable in the division of the leaves and the amount of pubescence, the latter always branched.—Very common on the plains and in the mountains at all heights. *Hall & Harbour*, 40; *Dr. Smith*; *Meehan*; *Porter*; *Brandege*; *Coulter*.

SISYMBRIUM GLAUCUM, Nutt. Annual, glaucous, about 1^o high, much branched, leaves entire, radical ones small, spatulate, cauline ovate, sagittate and clasping, rather acute; flowers minute, pale purple; petals cuneate-oblong, twice as long as the sepals; silicles $\frac{3}{4}$ ' long, glabrous; style almost none; seeds in a single or partly in a double series; cotyledons decidedly incumbent.

South Park, July, 1872, *Porter*. A slender dwarf-form, 3'-4' in height, with smaller leaves and shorter siliques.

*SMELOWSKIA*¹ *CALYCINA*, Meyer. (*Hutchinsia*, Desv.) Leaves mostly radical on long petioles, deeply pinnatifid; flowers white, in dense corymbs, the limb of the petal roundish; calyx persistent; stem 4'-6' high, elongating in fruit. Alpine and subalpine.—*Hall & Harbour*, 43. Mount Lincoln at 1,300 feet altitude, July, *Coulter*.

ERYSIMUM CHEIRANTHOIDES, L.—*Hall & Harbour*, 38. Twin Lakes at 9,000 feet altitude, *Porter*.

ERYSIMUM ASPERUM, DC., var. *ARKANSANUM*, Nutt.—Variable and abundant on the plains and mountains. *Hall & Harbour*, 39; *Dr. Smith*; *Porter*; *Coulter*.

Var. *PUMILUM*, Watson. *King's Rep.*, vol. 5, p. 24. (*E. pumilum*, Nutt.) Somewhat scabrous, stems 2'-4' high; leaves linear, all entire; flowers pale yellow, conspicuous; petals longer than the calyx; stigma small, nearly entire; pedicels very short; siliques flatly 4-sided, 3' long, erect.—*Hall & Harbour*, 39. Alpine.

¹ *SMELOWSKIA*, C. A. Meyer. Sepals short, equal; silicle rather short, narrowed at each end, somewhat tetragonal or laterally compressed; valves concave, submembranous, with included filiform replum and membranous septum; style short and stigma simple. Seeds few in one row, immarginate, funiculus setaceous, free; cotyledons incumbent.—Perennial hoary, tomentose subcaespitose herbs, with 1-2 pinnatifid leaves and bractless flowers. *Benth.* and *Hook.*

HESPERIS PALLASII, Torr. & Gray. *Fl. N. Am.* 2, p. 666. Sparsely pubescent with closely appressed hairs fixed by the middle and acute at each end, minutely scabrous under the microscope; stems 3'-6' high, from a fusiform root; radical leaves numerous, linear or lanceolate-linear, sparingly toothed, 1'-1½' long, tapering into a petiole; raceme short; pedicels much shorter than the flowers; flowers large for the size of the plant; upper cauline leaves linear; sepals oblong, obtuse, with scarious margins, gibbous at base, 4" long; petals with a long, broad, pale-colored claw which exceeds the sepals; limb round-obovate, purple; anthers cordate at base; ovary hairy; stigma capitate, somewhat 2-lobed.—The blunt lobes of the capitate stigma, which do not connive, separate this plant from the genus *Hesperis*. In all its other characters it seems to accord well with the brief description of Pursh's *Cheiranthus Pallasii*. The specimens are in flower only, with no mature siliques.—Chicago Lakes at 12,000 feet altitude, June, Coulter.

STANLEYA ¹ **PINNATIFIDA**, Nutt. (*S. integrifolia*, James.) Stems 2° to 3° high, often several from one root; lower leaves lyrate-pinnatifid or nearly entire, large, sometimes minutely pubescent beneath; upper leaves entire, narrowed at the base into a slender petiole; filaments very long and slender, pubescent below with a glandular enlargement at the base; siliques 2' long, somewhat torulose, twice longer than the stipe. *Hall & Harbour*, 50; *Coulter*. Colorado City, *Porter*.

²**THELYPODIUM INTEGRIFOLIUM**, Endl. (*Pachypodium*, Nutt.) Stem terete, smooth, 3°-5° high, attenuated upward and sending out numerous branches toward the summit; leaves entire, radical ones petioled, oblong-elliptical, cauline lanceolate, sessile, uppermost nearly linear; flowers almost corymbose, crowded, pale rose-color; pedicels ½' long, almost horizontal, twice as long as the calyx; petals spatulate, obovate; siliques short, abruptly pointed, on a short stipe.—South Park, July, *Porter*. Wet Mountain Valley, *Brandegee*. *Hall & Harbour*, 51. *Wooten*

THELYPODIUM LINEARIFOLIUM, Gr. (*Streptanthus*, Gr. *Pl. Fendl.*, p. 7.) Very glabrous, 1° or more high, from an annual or biennial root often branched from the base, erect, paniculate at the top; leaves linear, or the lower lanceolate, acutish, very entire, attenuate at base, sessile, somewhat rigid, pale, 1½'-2' long; sepals turning purplish; petals obovate, rose-purple, ½' or less; claws scarcely twice longer than the lax calyx; siliques erect, on spreading pedicels, very slender, teretish, 2' to 2½' long, apiculate with a very short style; valves carinate, 1-nerved; seeds oblong, without margins.—Cañon City and Wet Mountain Valley, *Brandegee*.

THELYPODIUM WRIGHTII, Gr. *Pl. Wright* 1, p. 7. Stem 2°-3° high, from a biennial or annual root; leaves broadly or narrowly lanceolate, 2' to 4' long, repand-dentate or denticulate, all narrowed into a short petiole; flowering racemes short and dense, fruiting raceme moderate-

¹ **STANLEYA**, Nutt. Sepals long, spreading. Petals narrowed, elongated, with long claws. Anthers twisted; siliques long-stipitate, slender, nearly terete, subcompressed; valves 1-nerved; style short or none; stigma simple. Seeds in one row, oblong, pendulous; cotyledons incumbent.—Perennial, glabrous, glaucous; flowers yellow, in long, strict, many flowered, bractless racemes. *Benth. and Hook.*

²**THELYPODIUM**, Endl. Sepals elongated, equal at base, often colored. Petals long, linear, or with a plane lamina, unguiculate. Anthers linear. Siliques sessile or with a very short thick stipe, linear, sub terete or somewhat compressed, torulose, not greatly elongated; valves convex, subcarinately 1-nerved; style rather short; stigma nearly entire. Seeds in one row, oblong, somewhat compressed, immarginate or scarcely margined; cotyledons more or less incumbent.—Annual or perennial, with spicately racemed bractless white or rose-colored flowers; siliques 1 to 2½' long. *S. Watson.*

ly elongated, 4'-5' long; pedicels divaricate, 6" long; petals scarcely exceeding the calyx; siliques slender, 2' long, widely spreading; on very short stipes; seeds oblong, emarginate.—Cañon City, *Brandegee*. Webster Cañon, *Redfield*.

CAMELINA SATIVA, Crantz. *Greene*. On the road from Denver to Idaho Springs, *Porter*. Introduced.

LEPIDIUM INTERMEDIUM, Gr.—*Porter*. Weston's Pass, July 18, *Coulter*. Denver, *Redfield*.—This species shows considerable variation. Apetalous states are not uncommon; one form from the neighborhood of Denver has such slender, delicate racemes and small pods, that if the pods were oval and not orbicular, it could be safely referred to *L. rudemale*, L. Denver, *Dr Smith*. Cañon City, *Brandegee*.

LEPIDIUM ALYSSOIDES, Gr. *Pl. Fendl.*, p. 10. Annual, glabrous, 6' to 12' high; stems diffuse, corymbose-racemose; branches minutely puberulent; leaves narrowly linear, mucronulate, attenuate at base, very entire, 1½'-2' long, 1''-2'' wide, lowest often pinnately 3-5 lobed; racemes dense, corymbose; petals round-spatulate, thrice longer than the calyx; stamens 6; siliques ovate, wingless, scarcely emarginate, glabrous; style very short, but thrice the length of the minute emargination.—South Park, July, *Porter*. Near Pueblo, *Greene*; *Redfield*.

LEPIDIUM MONTANUM, Nutt. Nearly glabrous, decumbent; branches many from a long, somewhat woody root, 8' to 12', spreading in a circular manner; radical leaves usually more or less bi-pinnatifid, segments short, acute, upper leaves trifid or entire; flowers rather conspicuous, sepals oval-oblong; petals nearly twice as long as the sepals; style conspicuous; siliques 2' long, indistinctly reticulated, elliptical, slightly emarginate, wingless; pedicels 3''-4'' long; cotyledons incumbent.—South Park, *Cauby*; *Porter*.

LEPIDIUM SATIVUM, L.—Near Denver, *Dr. Smith*. Introduced. Distinguished by its larger, ovate, winged pods, slightly notched at the top.

THLASPI ALPESTRE, L. (?) Perennial, glabrous; stems ascending, 3'-12' high, simple; radical leaves petioled, ovate or obovate, entire or denticulate, cauline ovate-oblong, cordate, clasping; racemes crowded, or usually elongated and loose, ½'-6' long; flowers rather large, petals 1''-3'' long; pods 2''-4'' long, acutely margined but not winged, short-oblong, cuneate at base, emarginate, truncate or rounded at the apex, 4-8 seeded; style ½''-1'' long.—We have followed Watson (in *King's Rep.*, vol. 5, p. 31) in naming this plant, which is usually referred to *T. cochleariforme*, DC.—Alpine and subalpine; frequent. *Hall & Harbour*, 46; *Meehan*; *Brandegee*; *Coulter*. Gray's Peak at 11,500 feet, *Redfield*.

CAPPARIDACEÆ.

CLEOME¹ INTEGRIFOLIA, T. & G. Annual, somewhat glaucous, 2^o-3^o high, widely branching; leaves 3-foliolate; leaflets lanceolate (the lowermost oblong) entire, submucronate; racemes sometimes nearly 1^o long; flowers large, showy, reddish purple, rarely white; sepals united to the middle, persistent; segments triangular-acuminate; petals with very short claws; stamens equal; pods oblong-linear, compressed, much longer than the stipe.—On water-courses along the foot-hills and

¹ *CLEOME*, L. Sepals distinct or somewhat united. Stamens 6 or rarely 4. Torus minute. Pod linear or oblong, subsessile or stipitate.—Annual herbs or shrubs, with digitate or simple leaves and racemed or solitary flowers. *Benth. & Hook.*

on the plains. *Dr. Smith; B. H. Smith; Porter; Coulter; Hall & Harbour, 52.*

CLEOMELLA ¹*ANGUSTIFOLIA*, Torr. Glabrous, 1° or more high, branching above; leaflets oblong-linear, acutish, very entire; upper bracts simple; ovary many times surpassing the style, shorter than the stipe; capsule dilated-rhomboid, acute; seeds transversely rugulose.—*Hall & Harbour, 53; Parry.* This is *C. tenuifolia*, Torr., 104 of Parry's Rocky Mountain Plants, *Gray's Enumeration, Sill. Jour., vol. 33, p. 404.*

POLANISIA *UNIGLANDULOSA*, DC. (*P. trachysperma*, T. & G. *Fl. N. Am.* 1, p. 669.) Viscidly pubescent, branching; leaves 3-foliolate; leaflets and bracts oblong-lanceolate; stamens 8-16; filaments deep purple, twice or thrice the length of the petals; style about the length of the ovary; pods linear-oblong, attenuate at base; seeds turgid, rough and warty; capsule short-stipitate.—On the Platte, near Denver, *Dr Smith; Redfield.*

P. grandis *Cañon City*

VIOLACEÆ.

VIOLA *PALUSTRIS*, L.—*Parry, 110.*

VIOLA *CUCULLATA*, Ait.—Bear Creek Cañon, *Coulter.*

VIOLA *DELPHINIFOLIA*, Nutt.—Plains near Denver and on the Saint Vrain River, *Coulter.* Golden City, *Greene.*

VIOLA *BIFLORA*, L. Stem weak, about 2-leaved, 2-flowered; leaves reniform, very obtuse, crenate; stipules ovate, very entire; flowers very small, yellow, petals marked with brown striae; sepals acute or acutish; spurs short.—*Hall & Harbour, 54.*

VIOLA *CANINA*, L.—Near Mount Lincoln, July, *Coulter.*

VIOLA *CANADENSIS*, L.—Cañon City, *Brandegee.* Near Long's Peak, May, *Coulter.*

VIOLA *NUTTALLII*, Pursh. Stems numerous, short, erect; leaves ovate-lanceolate, somewhat pubescent or nearly glabrous, undivided but sometimes obscurely sinuate-toothed, attenuated into a long petiole; stipules lanceolate, entire, or obscurely ciliate-toothed; flowers small, pale yellow; spur very short; peduncle shorter than the leaves.—*Hall & Harbour, 55.* Near Denver, May, *Coulter.*

IONIDIUM ²*LINEARE*, Torr. *Am. N. Y. Lyc.* 2, p. 168. Somewhat pubescent, stem branched; leaves opposite, occasionally alternate, entire or remotely serrulate, the lower varying from lanceolate to oblong or obovate, the upper linear, obtuse or acute, usually 3-4 times the length of the stipules; stipules linear, one-third the length of the leaves; peduncles slender, 2"-6" long, articulated, bibracteolate; flowers small; capsules glabrous; seeds turning black.—*Hall & Harbour, 57.* Cañon City, *Brandegee.*

¹ *CLEOMELLA*, DC. Sepals distinct, short and spreading. Torns short, oblong. Stamens 6, incurved in activation. Pod short, obovate-rhomboidal, 4-8 seeded, with reticulate, deltoid, or boat-shaped saccate valves, and upon a filiform stipe. Seeds smooth, pitted, or variously reticulated; embryo conduplicate; radicle elongated.—Annual glabrous herbs with stipulate 3-foliolate leaves, entire leaflets and racemed, leafy-bracted yellow flowers. *Benth. & Hook.*

² *IONIDIUM*, Vent. Sepals more or less unequal, not auricled; petals very unequal, the two upper shorter, the lower one very large, unguiculate; the claw dilated, shortly gibbous or concave; stamens approximate, the anterior ones each furnished with a nectariferous gland at the base.—Low herbs or suffruticose plants, leaves alternate or opposite; peduncles axillary, solitary. *Gr. Ges. III. 1, p. 183, t. 82.*

FRANKENIACEÆ.¹

FRANKENIA JAMESII, Torr. *Gr. in Proc. Am. Acad.* v. 8, p. 622. Much branched from a woody base, 6'-10'; branchlets minutely pubescent; leaves opposite, linear, strongly revolute on the margins, somewhat mucronate, 6''-8'' long, with fascicles of shorter ones in their axils; flowers terminal, sessile; petals long-clawed, white, limb oblong-cuneate, erose-denticulate at the tip, 2½''-3'' long, nearly twice the length of the calyx-tube; stamens 6, exserted; stigmas terminal; ovules 3, oblong-linear, pendulous from the apex of a very long subbasilar funiculus.—Cañon City, *Brandegee*. Near Pueblo, *Redfield*.

CARYOPHYLLACEÆ.

SAPONARIA VACCARIA, L. (*Vaccaria vulgaris*, Host.)—*Hoopes*; *Greene*. Introduced.

SILENE ACAULIS, L. *Gray's Manual*, p. 90.—High alpine, growing in dense mats near the snow-line, at 10,000 to 14,000 feet altitude. July, August. *Hall & Harbour*, 65. *Gray's Peak*, *Dr. Smith*; *B. H. Smith*. *Pike's Peak*, *Porter*. Mount Lincoln, at 14,000 feet altitude, *Coulter*. *Gray's Peak*, 12,000 to 13,000 feet, *Redfield*.

SILENE SCOULERI, Hook. Stem erect; racemes sub-compound, narrow, few-flowered; flowers erect or nodding, longer or shorter than the pedicels; calyx oblong, clavate, somewhat dilating, teeth broad-lanceolate, acutish, slightly ciliate; petals white or pinkish, bifid, the lobes oblong, emarginate, the appendages obtuse; claws with acute auricles, woolly-ciliate as well as the filaments; capsule obovate-oblong, three to four times longer than the stipe.—*Hall & Harbour*, 61; *Hoopes*. In the mountains.

SILENE MENZIESII, Hook. Minutely glandular-pubescent; stems numerous, dichotomously branched, 6'-12' high, weak, ascending, leafy to the summit; leaves crowded, ovate-lanceolate or oblong-ovate, acuminate at both ends; peduncles axillary and terminal, 1-flowered; petals white, bifid, 3' long, exceeding the obovate, deeply 5-toothed calyx; styles thickened above, conspicuously bearded within.—*Hall & Harbour*, 64.

LYCHNIS APETALA, L. Pubescent; stems simple, 3'-4' high, 1-flowered; calyx ovoid, 10-striate, including the petals; filaments and claws of the petals naked; seeds large and margined.—*Hall & Harbour*, 63. Mount Lincoln at 13,000 feet altitude, July, *Coulter*.

LYCHNIS DRUMMONDII, Watson. (*Silene Drummondii*, Hook. ?) *King's Rep.*, vol. 5, p. 37. Glandular-pubescent and viscid; stems several, 1^o-3^o high, erect, simple; leaves remote, linear-lanceolate; raceme loose, few-flowered, with elongated pedicels, alternate or oppo-

¹ FRANKENIACEÆ. A. St. Hil. Sepals 5, united in a furrowed tube, persistent, equal; petals alternate with the sepals; stamens hypogynous, either equal in number to the petals and alternate with them, or having a tendency to double the number; anthers roundish, versatile; ovary 1-celled, with 2-3 parietal placentae; styles 2-3, filiform, united for a considerable part of their length; capsule 1-celled, included in the calyx, 2-3, or 4-valved, many seeded; seeds attached to the margins of the valves, very minute, anatropous; embryo straight; erect in the midst of albumen.—Herbaceous plants or undershrubs. Stems very much branched. Leaves opposite, exstipulate, with a membranaceous sheathing base, often revolute at the edges. Flowers sessile in the divisions of the branches, and terminal, embosomed in leaves, usually pink. *Lindl.*

FRANKENIA, L. Styles 3, united below, stigmatic along the inner surface; capsule loculicidal; many-seeded. *Torr. & Gray*.

site; flowers 3-5; calyx oblong, cylindrical, erect; petals white or purplish, the limb 2-lobed or emarginate, scarcely exceeding the calyx, minutely crowned and narrower than the obtusely, strongly auricled claw; seeds reniform, uniformly tuberculated under the microscope, emarginate.—In the mountains at middle elevations. *Hall & Harbour*, 62; *Dr. Smith*; *Canby*; *Brandegee*. South Park, *Coulter*.

CERASTIUM VULGATUM, L., var. *BEHRINGIANUM*, Gr. Flowers large, petals and capsules half longer than the calyx, shorter than the pedicels; stems few, 2-4 flowered.—*Hall & Harbour*; *Brandegee*. Mount Lincoln, *Coulter*.

CERASTIUM ARVENSE, L.—In the mountains, at all elevations. *Hall & Harbour*, 75; *Dr. Smith*; *B. H. Smith*; *Meehan*; *Porter*; *Coulter*.

STELLARIA JAMESIANA, Torr. *Ann. N. Y. Lyc.*, v. 2, p. 169. Viscidly pubescent; leaves linear-lanceolate, 4' long, acute; stems weak, 1°-2° high; leaves slightly falcate, closely sessile; cyme divaricate; few flowered; petals two-lobed, twice longer than the oblong, acute sepals; capsule as long as the calyx, deeply valved; seeds few, rugose.—*Hall & Harbour*, 78.

STELLARIA LONGIPES, Goldie.—At all elevations. *Hall & Harbour*, 71 and 76; *Canby*; *Brandegee*; *Coulter*.

STELLARIA CRASSIFOLIA, Ehrh.—*Hall & Harbour*.

STELLARIA BOREALIS, Big.—Alpine and subalpine. *Hall & Harbour*, 72; *Dr. Smith*. Mount of the Holy Cross, at 13,000 feet altitude, August, *Coulter*.

STELLARIA UMBELLATA, Turcz. Glabrous, stem 6'-1° high, weak; leaves ovate to oblong-lanceolate; peduncles axillary and terminal, divaricate, filiform and elongated, with scarious bracts; petals wanting; sepals short, 1' long, ovate, acute, nerveless or 1-nerved, (rarely 3-nerved;) capsule deeply valved, twice longer than the calyx; seeds smooth.—*Hall & Harbour*, 70. Twin Lakes, *Coulter*.

ARENARIA CONGESTA, Nutt. Cæspitose, glabrous; stem simple, 6'-1° high; leaves long; linear-subulate, pungent, over 2' long; flowers in roundish, compact heads or fascicles, with crowded membranaceous bracts; sepals ovate, membranous, obscurely 3-nerved, about half the length of the oblong petals; capsule coriaceous, equaling the calyx; seeds very small, angular, smooth.—White House Mountain, at 13,000 feet altitude, *Coulter*. North Park, *Hayden*.

ARENARIA FENDLERI, Gr. Stems numerous, from a perennial caudex, 6'-15' high, glabrous below, more or less glandular, pubescent above, imbricately many-leaved at base; leaves long, 3'-5', erect, setaceous, somewhat flattened; serrulate-scabrous, smooth except on the margins, those of the stem successively shorter; cymes strict and few-flowered; pedicels slender; sepals ovate-lanceolate, cuspidate, acuminate, green, with a broad, scarious margin, 5-nerved, nearly equaling the obovate petals, which are white and 4' long; styles exserted; capsule about equaling the calyx, 6-valved; seeds papillose-scabrous.—*Hall & Harbour*, 79; *Parry*; *Canby*; *Dr. Smith*; *B. H. Smith*; *Meehan*; *Brandegee*; *Porter*; *Coulter*.

Var. *SUBCONGESTA*, Watson. Low, 3'-6' high, smooth except the minutely puberulent short pedicels, few-flowered; petals but little exceeding the ovate, acuminate, scarious sepals; leaves short.—Hills around Cañon City, *Brandegee*.

Var. *DIFFUSA*. Branches of the cyme elongated, lax and widely spreading; flowers numerous.—Ute Pass, *Porter*.

ARENARIA VERNA, L., var. *HIRTA*, Fenzl. Cæspitose, 2'-3' high, minutely hirsute; leaves subulate, 3-nerved, erect, obtuse or acutish; cyme erect, few or many flowered; sepals ovate, acute, strongly 3-nerved, mostly exceeding the petals.—Summit of Pike's Peak, *Canby*. Clear Creek Cañon, *Coulter*. James's Peak, *Greene*.

ARENARIA ARCTICA, Stev., var. *OBTUSA*. T. & G. Cæspitose, stems 1'-3' high; leaves linear-subulate, obtuse, carinate, thickish, serrulate-ciliate, obscurely 3-nerved; peduncles glandular-pubescent, 1 (rarely 2-3) flowered; petals about half longer than the oblong sepals.—*Hall & Harbour*, 77; *Dr. Smith*; *B. H. Smith*; *Meehan*; *Brandegee*. Mount Lincoln at 13,000 feet altitude, *Coulter*. Gray's Peak, *Redfield*.

ARENARIA ALPINA, L. (*Alsine biflora*, Wahl.) Cæspitose, stems creeping, branches erect, 2'-3' high, mostly 1-flowered, minutely pubescent; leaves narrowly linear, 3"-3½" long, nerveless, subconvex beneath; sepals linear, very obtuse, cucullate at the summit, 3-nerved; petals oblong, cuneate, much longer than the capsule and calyx.—*Hall & Harbour*, 77; *Canby*.

ARENARIA (ALSINE) ROSSII, R. Br. Cæspitose; leaves subulate-triquetrous, rather obtuse, nerveless, scarcely equaling the flower or exceeding the calyx, mostly shorter than the internodes, with manifest lateral nerves; peduncles 1-flowered; petals oblong, as long as or a little exceeding the obscurely 3-nerved sepals. Flowers sometimes apetalous.—*Hall & Harbour*, 69. Clear Creek Cañon, *Coulter*.

ARENARIA LATERIFLORA, L.—*Hall & Harbour*, 74.

SAGINA LINNÆI, Presl. (*S. decumbens*, T. & G.) Mostly glabrous; stems decumbent, branched, ascending, 1'-3' long; leaves linear-subulate, very acute; peduncles much longer than the leaves; petals and sepals 5, equal, obtuse; capsule a little longer than the calyx. Almost wholly apetalous, glabrous, with narrowly linear leaves, which are mostly mucronate; sepals oblong or ovate.—*Hall & Harbour*, 68. Twin Lake Creek, *Coulter*.

PORTULACACEÆ.

PORTULACA OLERACEA, L. (*P. retusa*, Eng.)—Denver, July 31, *Dr. Smith*; *Greene*. Introduced.

TALINUM TERETIFOLIUM, Pursh. Found in the mountains with flowers fully as large as in eastern specimens.—*Hall & Harbour*, 81. *Meehan*; *Porter*; *Brandegee*. Colorado Springs and Chiann Cañon.

*CALANDRINIA*¹ *PYGMEÆ*, Gr. (*Talinum pygmaeum*, Gr.) *Proc. Am. Acad.*, v. 8, p. 623. Acanthescent, glabrous; root thick, fusiform; the linear leaves and 1-3 flowered scapes (1'-2') crowded; sepals orbicular, glandular-dentate or entire; petals rose color, 6-8, unequal; stamens, 4-7; stigmas 3-5; style short, or almost none; ovules, 16-20.—*Parry*, 143. Mount Lincoln at 13,500 feet altitude, *Coulter*. Gray's Peak, *Redfield*. Alpine.

CLAYTONIA CAROLINIANA, Mx., var. *LANCEOLATA*, Watson, (*C. lanceolata*, Pursh.) Cauline leaves ovate, lanceolate or linear, sessile or short-petioled; petals more or less emarginate or entire, rose-color or white.—Mount Lincoln at 14,000 feet altitude, July, *Coulter*.

¹ *CALANDRINIA*, H. and B. Calyx 2-parted, persistent. Petals 3-5, distinct or somewhat connate at base. Stamens 4 to 15. Style very short, 3-cleft at the apex, lobes clavate. Capsule oblong-elliptic, 3-valved. Seeds estrophiolate.

CLAYTONIA ARCTICA, Adams, var. *MEGARHIZA*, Gr. *Sill. Jour.* (N. S.) 33, p. 406. Root fusiform, very large; leaves 1'-6' long, 2"-12" wide, fleshy; radical ones petioled, cauline ones lanceolate or linear-lanceolate, opposite, sessile, racemes secund, subsessile; flowers large; petals obovate, submarginate, 2"-6" long. Flowers from June to August. —High alpine, growing in crevices of the rock, its large, purple tap-root penetrating to a great depth. Flowers profuse, white, with pinkish veins. —*Hall & Harbour*, 83; *Parry*, 142. Gray's Peak at 14,000 feet altitude, *Coulter & Redfield*.

CLAYTONIA CHAMISSONIS, Esch. & Ledeb. (*C. aquatica*, Nutt.) Stems erect or decumbent, stoloniferous and rooting at the joints, becoming 1° in length; roots bulbiferous; leaves opposite, spatulate, or oblong-obovate, attenuate below, rather obtuse, 1'-2' long; racemes apparently axillary, peduncled, simple, few-flowered; flowers white, rather large; petals obovate, entire, twice longer than the calyx. —*Hall & Harbour*, 84; *Parry & Canby*; *Meehan*; *Brandegee*; *Coulter*. Sangre de Cristo Range, *Redfield*.

ELATINACEÆ.

ELATINE AMERICANA, Arn. —On the Platte River, *Hall & Harbour*, 59.

HYPERICACEÆ.

HYPERICUM SCOULEI, Hook. Perennial, herbaceous; stems terete below, 6"-2° high; leaves oblong-obovate, closely sessile or clasping, very obtuse, $\frac{3}{4}$ ' long, not dotted, under-surface with numerous prominent veins; cyme compound; sepals broadly ovate, rather obtuse, $\frac{1}{2}$ the length of the petals; sepals, petals, and anthers dotted with black; stamens numerous; styles 3, distinct, erect; capsules tricarpeillary; placentæ united to the middle. —Common. *Hall & Harbour*, 58; *Meehan*; *Canby*; *Brandegee*; *Coulter*.

MALVACEÆ.

CALLIERHOË INVOLUCRATA, Gr. Hirsute; stem branching, procumbent, leaves deeply 3-5-parted, covered with stellate hairs, segments linear-lanceolate, laciniately 3-5-toothed; peduncles erect, 1-flowered, longer than the leaves; flowers few in a loose panicle, about 1½' in diameter, axillary, scarlet; bracteoles 3, linear-lanceolate, $\frac{2}{3}$ the length of the deeply-parted calyx; carpels numerous, hairy, not wrinkled. —Purgatory River, *Dr. Bell*. *Parry*, 148.

SIDALCEA¹ MALY-EPIFLORA, Gr. Glabrous or hispid, 1°-3° high, simple; lower leaves roundish, more or less deeply 7-9 lobed, cauline more narrowly and deeply 5-7 lobed, segments linear, somewhat toothed; raceme terminal; pedicels at first shorter, at length longer than the subulate bracts; calyx hispid or tomentose, the lobes ovate, acute or acuminate; flowers variable in size, 1'-2' in diameter, purple, occasionally white; styles 7-8, free at the summit; stigma simple; carpels 7, pointless. —Middle elevations in the mountains. North Park, *Hayden*. South Park, *Porter*; *Canby*; *Brandegee*.

¹*SIDALCEA*, Gray. Bractlets none. Calyx 5, cleft. Staminal tube double; the outer of 5, the inner of 10 narrower phalanges of stamens. Styles united below, filiform, stigmatose the whole length of the inner face. Ovaries 5-9, united in a circle around a central receptacle. Carpels membranous, beakless, reniform, 1-seeded, indehiscent, separating from the short axis. Seed reniform, ascending. —Perennial herbs, with purple, rose-colored or white flowers in paniculate racemes. *Gr., Gen. III., 2, p. 57.*

SIDALCEA CANDIDA, Gr. *Pl. Feudl.*, p. 24. Stems simple, 2°-3° high, from a perennial, creeping rhizoma, leafy, glabrous above, sparsely hairy below; lower leaves orbicular, 2'-8' in diameter, 7-lobed, smooth, ciliate, segments coarsely 3-5 toothed, or incised, rounded; upper leaves 7-lobed or parted, the floral ones 3-5, segments lanceolate, entire; stipules oval, ciliate; raceme usually short, compact, glandular, tomentose; pedicels shorter than the bracts; lobes of the tomentose calyx ovate; corolla white or cream-color; petals 8"-12" long; anthers blue; carpels 9-10, smooth, cochleate-reniform; minutely apiculate at the inner angle, mucronate.—On water-courses. Rare. *Hall & Harbour*, 85; *Parry*, 429; *Meehan*; *Brandegee*. Eagle River, *Coulter*.

MALVASTRUM COCCINEUM, Gr.—Common at low elevations, in dry soil. *Hall & Harbour*, 86; *Dr. Smith*; *B. H. Smith*; *Canby*; *Porter*; *Coulter*. Abundant along the Platte. Colorado Springs, *Redfield*.

SPHERALCEA¹ ANGUSTIFOLIA, Spach. (*S. stellata*, T. & G. *Pl. N. Am.* 1, p. 228.) Densely clothed with a grayish, stellate pubescence; stem 1°-3° high, branched; leaves oblong-lanceolate, acute, petioled, 2'-3' long, 4"-9" wide, erose-serrulate, rugose; petioles 4"-12" in length; peduncles axillary, shorter than the petioles, 2-many-flowered; flowers more or less aggregated; corolla purple; carpels 12-14, with two short, slightly recurved points; 2, rarely 3-seeded; seeds reniform, glabrous; stipules setaceous.—Cañon City, *Brandegee*. Common about Pueblo, *Greene*.

ABUTILON² PARVULUM, Gr. *Pl. Wright*, 1, p. 21. Cinereous-tomentose with a lax minute pubescence; stems slender, spreading, from a perennial woody root, paniculate above; branchlets pilose with spreading hairs; leaves small, 6"-12" broad, cordate, dentate, sometimes 3-lobed, usually obtuse, canescent, tomentose beneath; peduncles axillary, 1-flowered, longer than the leaf; flowers small, yellow; capsule ovoid, somewhat tomentose, 5-lobed at the apex, much longer than the short calyx; carpels erect, 5, rather obtuse, awnless, 2-3-seeded.—Ledges of rock near Cañon City, *Greene*.

LINACEÆ.

LINUM PERENNE, L. Perennial, glabrous; stems 1°-3° high, branching above; branches virgate; leaves alternate, scattered, linear, acute; flowers terminal and nearly opposite the leaves, large; peduncles becoming elongated and nodding in fruit; sepals oval, with membranous margins, a little shorter than the globose capsule; petals free, retuse, blue, 3-4 times the length of the calyx; styles 5, capsule 5-celled, with bearded dissepiments.—Not rare in the mountains, but more common at higher elevations. *Hall & Harbour*, 87; *Dr. Smith*. North Park, *Hayden*; *Coulter*.

LINUM RIGIDUM, Pursh. Stems 5'-15' high, angled, much-branched; branches strict, ascending; leaves alternate; linear, pungently-acute, rigid, with scabrous margins; flowers panicled or corymbose; pedicels

¹ SPHERALCEA, St. Hil. Involucrel 2-3 leaved, setaceous, often deciduous. Stigmae capitate. Ovaries many, 15-20. Carpels 1-celled, 2-ovuled, the lower ovule ascending, the other pendulous, compressed, often truncate and pointed above, membranaceous or coriaceous, 2-valved above, hardly separating from each other and from the axis. Radicle inferior, or in the upper seed centripetal-superior. *Gr., Gen. Ill.*, 2, p. 69.

² ABUTILON, Tourn., Gertu. Involucrel none. Stigmae capitate. Ovules 3 in each carpel, rarely 4-8, all or the lower spreading or resupinate-pendulous. Fruit of 5-many carpels. Carpels, 1-celled, about 2-valved, scarcely separating from the axis. Radicle ascending or centripetal. Leaves cordate. *Gray, Gen. Ill.*, 2, p. 65.

thickened at the end, and forming an exterior cup-shaped calyculus; sepals ovate-lanceolate, cuspidate, strongly 3-nerved, glandular spinulose-scabrous on the margins, longer than the globose capsule; petals sulphur-yellow.—Cañon City, *Brandegee*; *Greene*.

GERANIACEÆ.

GERANIUM RICHARDSONII, F. and M. (*G. albiflorum*, Hook.) Stem erect, 1½°-3° high, dichotomously branching, glabrous below, branches slender; leaves deeply 5-parted, lobes sharply incised, sparsely pubescent; petioles smooth; radical ones on long petioles, uppermost opposite, on short petioles, rather acuminate; pedicels and sepals glandular pilose; petals entire, white or pale rose-color, hirsute at base; filaments pilose at base, equaling the pilose styles, which are connate one-third their length; capsule glandular-pilose.—Growing in damp, shaded spots along water-courses in the mountains, frequent. Taller but less robust in all its parts and less hairy than the following, from which in some forms it can scarcely be distinguished.—*Hall & Harbour*, 88; *Porter*; *Brandegee*; *Coulter*.

GERANIUM FREMONTII, Torr. *Plant. Fendl.*, p. 26. Perennial, stems numerous, diffusely branching, 6'-1° in height, more or less pubescent throughout, with a short, close, glandular pubescence sparsely intermixed with longer, pilose hairs; upper leaves deeply 3-5-cleft, truncate at base, or the lowest cordate with a broad sinus, radical ones 7-cleft, segments 3-lobed or incised, mucronate-acute; peduncles 1'-3' long, bearing two flowers on pedicels 1'-2' long; sepals short-awned; fruiting pedicels more or less divaricate and declined; petals obovate, emarginate, light or deep purple, villose at the base, sparingly villose-bearded on the veins; filaments pilose-ciliate, equaling the naked styles which are connate below; seeds delicately reticulated; stems numerous and spreading, divaricately branched above, growing in dense tufts, with large purple flowers 1' in diameter.—Very common on dry, open hill-sides, on the plains and in the mountains. *Dr. Smith*; *B. H. Smith*; *Porter*; *Coulter*. The degree of pubescence is variable, some forms being nearly smooth.

OXALIS VIOLACEA, L.—Glen Eyrie. *Porter*.

OXALIS STRICTA, L.—In the lower foot-hills. *Dr. Smith*; *Brandegee*; *Coulter*.

ZYGOPHYLLACEÆ.

KALLSTROEMIA MAXIMA, T. & G. (*Tribulus maximus*, L.) Stems diffusely procumbent, 1°-2° long leaves opposite, abruptly pinnate; leaflets in three, or, rarely, four pairs, oblong or oval; mucronate, slightly falcate, pubescent beneath, terminal ones largest; peduncles 1' long, solitary, axillary, 1-flowered; flowers yellow; petals marcescent; cocci gibbous below, tuberculate.—Fremont County, *Brandegee*.

¹ZYGOPHYLLACEÆ, R. Br. Flowers perfect, regular, sepals 4-6. Estivation usually convolute. Petals 4-6, alternate with the sepals, clawed; at first short and scale-like; at length equal to the sepals. Stamens twice as many, hypogynous. Filaments distinct, dilated at base, sometimes placed on the back of a small scale. Anthers fixed near the middle, introrse. Ovary of 4-5 united carpels, opposite the petals, with five scales or glands at base, or surrounded by a sinuate disk. Ovules two or more, attached to the inner angle of the carpel, pendulous or rarely erect. Styles and stigmas united. Fruit capsular, carpels 4-5, which sometimes in fruit split into ten 1-seeded cocci without transverse partitions.—Herbs, shrubs, or trees. Leaves opposite, stipulate, not dotted, rarely simple.

KALLSTROEMIA, Scop. Sepals 5-6, persistent, lanceolate or subulate. Petals 5, obovate. Filaments 10-12, naked. Ovaries 10-12-celled, cells 1-ovuled. Berries separating from the persistent styliiferous axis, 1-seeded, indehiscent. Style conical, 10-furrowed. Stigma capitate, 10-ribbed.

RUTACEÆ.

PTELEA ANGUSTIFOLIA, Benth. Distinguished from *P. trifoliata*, L., (*Gray's Manual*, p. 110,) by its much smaller and more emarginate fruit, and its oblong or lanceolate leaves, pubescent or villous, becoming smooth and shining with age.—Fifteen miles west of Cañon City, *Porter*; *Redfield*.

VITACEÆ.

VITIS RIPARIA, Mx. (*V. cordifolia*, Mx., var. *riparia*., Gr.)—Cañon City. *Brandegee*.

AMPELOPSIS QUINQUEFOLIA, Mx.—*Mechan*.

CELASTRINEÆ.

*PACHYSTIMA*¹ *MYRSINITES*, Raf. (*Oreophila myrtifolia*, Nutt.) Stems 1°-2° high, densely branched, very leafy; leaves roundish-oval, or oblong, $\frac{3}{8}$ "-9" long; flowers somewhat fasciated on short peduncles, small, green or brownish, apparently always perfect (monœcious, *Nuttall*).—In dense clumps on wooded slopes. *Hall & Harbour*, 92; *Parry*. At middle elevations, rare.

RHAMNACEÆ.

CEANOTHUS VELUTINUS, Dougl., var. *LEVIGATUS*, T. & G. A densely-branched shrub, usually 2°-4° high; leaves round or ovate-elliptical, 2'-3' long, rather obtuse, sub-cordate, glandularly crenate-serrate, coriaceous, glabrous and shining above, smooth or very slightly pubescent and strongly 3-ribbed beneath; petioles $\frac{1}{2}$ ' in length; panicles axillary, compound, on rather long peduncles; flowers white.—*Parry*. Mountains west of Denver, *Greene*.

CEANOTHUS FENDLERI, Gr. Shrub, 1½° high, widely and intricately branched; branches and branchlets terete, slender, often spinescent, whitish, puberulent, at length glabrous, smooth; leaves small, $\frac{1}{2}$ '-1' long, oval or elliptic, obtuse, very entire, not glandular, 3-nerved, silky-canescens beneath, smoothish and green above; flowers in clusters, dense, sessile, glabrous, white.—*Hall & Harbour*, 90. Wet Mountain Valley, *Brandegee*. In the mountains, on the road from Denver to Idaho Springs, *Porter*. Sangre de Cristo Range, *Redfield*.

CEANOTHUS OVALIS, Big.—Foot-hills along the Platte, *June*, *Coulter*.

CEANOTHUS OVATUS, Desf., *DC. Prod.*, 2, p. 31. (*C. Americanus*, L., var. *herbaceus*, T. & G. *Fl. N. Am.* 1, p. 264.) Leaves ovate or oval, serrate, 3-nerved, glabrous; thyrsus shortened; fruit sub-globose, 6-ribbed.—*Hall & Harbour*, 91. This plant we have not seen.

SAPINDACEÆ.

ACER GLABRUM, Torr. (*A. tripartitum*, Nutt.) Shrub, 6°-10° high; leaves sub-reniform, orbicular in outline, 3-lobed or more usually 3-parted; segments short and broad, acutely incised and toothed, somewhat 3-lobed, middle one cuneate; corymb unbeled, pedunculate, few-

¹ *PACHYSTIMA*, Raf. Petals and stamens 4, inserted on or below the margin of the broad, flat, quadrangular disk that covers the small pyramidal ovary, and adheres to the throat of the short, obconic, 4-lobed calyx. Style very short; stigma obsolete 2-lobed. Capsule coriaceous, oblong, acute, 2-celled, loculicidally 2-valved; cells 1-2 seeded. Seeds inclosed in a white, membranous, dissected axil.—A low, branched, leafy, glabrous shrub, with opposite, short-petioled, mostly serrate, evergreen leaves and axillary flowers. *Benth. & Hook.*

flowered; sepals about 8, linear-oblong; petals wanting; fruit glabrous, wings broad, diverging.—Along water-courses among the mountains. *Dr. Smith; Coulter.*

NEGUNDO ACEROIDES, Mœnch.—Cañon City, *Brandegee.* Along the Platte, *Coulter.*

ANACARDIACEÆ.

RHUS GLABRA, L.—Golden City, *Greene.*

RHUS TOXICODENDRON, L.—Grows on dry slopes. Poisonous. Turkey Creek, *Coulter.*

RHUS AROMATICA, Ait., var. TRILOBATA, Gr. (*R. trilobata* Nutt.) A much-branched shrub, 3^o-6^o high, smooth or with the leaves and young branches minutely pubescent; leaves trifoliate, paler beneath, lateral leaflets obovate, obtuse, 3-lobed at the apex, or nearly entire; terminal leaflet larger, cuneiform, 3-lobed at the summit, 1'-1½' in length.—Emitting a heavy, disagreeable odor when bruised. Distinguished from the eastern form by its greater size, smaller leaves, and smoother drupes.—*Dr. Smith; B. H. Smith.* Common on the mesas near Colorado Springs, *Porter.* Clear Creek Cañon, *Coulter.*

POLYGALACEÆ.

POLYGALA VERTICILLATA, L.—Dudley's Ranch, on Clear Creek, *Greene.*

LEGUMINOSÆ.

THERMOPSIS¹ RHOMBIFOLIA, Nutt. Perennial; stems erect, 8'-12' high, angular, nearly smooth; leaves petioled; leaflets obovate-cuneiform, silky-puberulent, at length nearly glabrous; stipules ovate or cordate, acute, as long as the petioles; flowers yellow, alternate or in pairs, lance-oval, shorter than the pedicels; calyx-short, teeth triangular, acute, the upper lip 2-toothed; legumes elongated, falcate, pendulous, glabrous, about 3' long.—*Hall & Harbour, 107; Canby.*

THERMOPSIS FABACEA, DC., var. MONTANA, Gr. Somewhat pubescent; stems numerous, branched; leaflets 1'-3' long, oblanceolate, obtuse; stipules oblong-ovate, exceeding the petioles; legumes downy, 2'-3' long, linear-oblong, erect, nearly straight, about 10 seeded.—Middle elevations in the mountains and on the plains. *Canby.* Four miles from Denver on Clear Creek, *Coulter.* South Park, *Porter.*

LUPINUS ORNATUS, Dougl. *Watson's Revision*, in *Proc. Amer. Acad.* v. 8, p. 528. Stems decumbent or ascending; pubescence usually short, more or less silky, mostly appressed; stipules setaceous; leaflets 5-7, oblanceolate or cuneate-oblong; ¾'-2' long, acute or acutish; raceme 3'-8' long, usually short-peduncled; bracts short, subulate or ovate; pedicels 2'-3' long; bractlets setaceous; calyx-lips nearly equal, the upper rather shortly toothed or bifid, the lower subentire; petals blue, equal, 5'-7' long, the banner acutish sub-silky on the back, keel ciliate; ovules 5-8; pod 1½' long, 3'-4' wide.

VAR. GLABRATUS, Watson. Leaflets glabrous above, cuneate-oblong, acutish or obtuse; flowers nearly white, with a dark purple spot upon the banner. "Common in the mountains of Colorado."—*Hall & Harbour, 95.*

¹ THERMOPSIS, R. Br. Like *Baptisia* (*Gray's Manual*, p. 142,) but with large, foliaceous stipules, and long, flat legumes.

LUPINUS PARVIFLORUS, Nutt. *Watson's Rev.*, l. c., p. 531. Strict, erect, slender, 2°-3° high, at length branching; pubescence scanty, short, appressed, the calyx and pedicels silky; stipules setaceous; leaves rather distant; leaflets 5-11, oblanceolate to obovate, 1'-2' long, acute or obtuse and mucronulate, glabrous above, the lower leaves shorter than the petioles; raceme $\frac{1}{2}$ °-1° long, slender, bracts linear-subulate, equaling the calyx; flowers subverticillate or scattered, the slender pedicels 1''-2'' long; calyx-lips nearly equal, the upper 2-toothed; petals light-blue, equal, 3''-4'' long, keel ciliate or naked; pod $\frac{3}{4}$ ' long, 2-4-seeded, pubescent.—Very abundant near the Twin Lakes, *Porter and Coulter*.

LUPINUS ARGENTEUS, Pursh. *Watson's Rev.*, l. c., p. 532. Erect or ascending, 1°-2° high, slender; pubescence minute, silky, appressed; stipules small; leaflets 5-8, linear lanceolate, $\frac{3}{4}$ '-1 $\frac{1}{2}$ ' long, acute, smooth above or nearly so, about equaling the petioles; racemes 3'-6' long, nearly sessile; flowers subverticillate or scattered, pedicels $\frac{1}{2}$ '-2'' long; calyx campanulate, gibbous but not spurred at base, minutely bracteolate, upper lip broad, 2-toothed, the lower subentire slightly longer; petals blue or cream-colored, equal, 3''-4'' long, the banner very broad, naked or subhairy, keel naked or subciliate; ovules 5-3; pod $\frac{3}{4}$ '-1' long.

Var. **DECUMBENS**, Watson. (*L. decumbens*, Torr.) Raceme dense and many-flowered; stem usually stouter and more leafy.—*Dr. Smith; Brandegee; Canby; Coulter; Porter*.

Var. **ARGOPHYLLUS**, Watson. With the habit of var. *decumbens*, but more copiously silky-pubescent, the leaflets nearly or quite equally so upon both sides, longer than the petioles; flowers larger, 5''-6'' long, blue or ochroleucous, the calyx decidedly spurred. Approaching nearly to *D. laxiflorus*.—*Brandegee*.

LUPINUS CAESPITOSUS, Nutt. *Watson's Rev.*, l. c., p. 533. Caespitose dwarf, 2'-4' high, nearly stemless, silky-hirsute; leaflets 5-7, oblong-lanceolate, attenuate at base, much shorter than the petiole; stipules adnate, subulate; spikes sessile; densely flowered, shorter than the leaves; bracts setaceous, deciduous; calyx bracteolate, the upper lip 2-parted, lower obscurely 3-toothed; petals pale-blue, equal, 3''-4'' long; legume villous, 3-4-seeded.—“West of the Snowy Range on Blue River.” *Hall & Harbour*, 96. In the Sierra Madre Range, *Coulter*.

LUPINUS PUSILLUS, Pursh. *Watson's Rev.*, l. c., p. 539. Annual, low, very hirsute with long spreading hairs; stems 3'-10' high, branching from the base; leaflets 3-7, more usually 5, cuneate-oblong or oblanceolate, $\frac{3}{4}$ '-1 $\frac{1}{4}$ ' long, narrowed at the base, acute or obtuse, smoother above, about half as long as the petioles; raceme spicate, usually short-peduncled, 2'-3' long; flowers alternate, wings equaling the keel; bracts persistent; calyx ebracteolate, upper lip 2-cleft, shorter than the subentire lower one; petals purple or rose-color, 4'' long, equal; legumes over $\frac{1}{2}$ ' long, very hirsute, about 2-seeded; seeds orbicular, flattened.—*Hall & Harbour*, 94; *B. H. Smith; Brandegee*. Near Denver, *Coulter; Porter*.

TRIFOLIUM LONGIPES, Nutt. Somewhat pubescent; root creeping; stems erect or ascending, simple, 3'-1° high; petioles slender; leaflets linear-lanceolate, serrulate, silky-pubescent beneath; radical ones often oval or oblong; stipules semi-lanceolate, acuminate; heads of flowers sub-globose, ebracteate, on long peduncles; flowers ochroleucous, rarely purple, frequently deflexed in fruit; calyx-teeth setaceous, longer than the tube, nearly equal; petals lanceolate; ovary 4-5 ovuled.—*Parry*. Mount Lincoln at 12,000 feet altitude, *Coulter*.

TRIFOLIUM NANUM, Torr. Glabrous, caespitose, caudex short and thick, branching, 1'-2' high; leaflets ovate-oblong, somewhat acuminate, denticulate, strongly veined, on rather long petioles; stipules membranaceous, ovate, cuspidate; peduncles very short, radical; umbellately about 3-flowered; flowers large, $\frac{3}{4}$ ' long, dark purple, scarcely unfolding; calyx tubular-campanulate, glabrous, teeth nearly equal, triangular-subulate, shorter than the tube; vexillum broadly obovate, 3-times the length of the calyx; legume 4-5-seeded.—Alpine. *Hall & Harbour*, 99; *Parry*; *Brandegee*. Mount Lincoln at 14,000 feet altitude, *Coulter*.

TRIFOLIUM DASYPHYLLUM, T. & G. Densely caespitose; caudex short and thick, branching, 2'-4' high; leaves, peduncles, and calyx more or less canescently silky; leaflets linear, oblong-lanceolate, acute or acuminate, entire; stipules membranaceous, lanceolate, subulate-acuminate; head globose, on a long radical peduncle, bracteate, 1' in diameter; bracts lanceolate, scarious-margined, unequal; teeth of the calyx setaceous, nearly equal, exceeding the tube and a little shorter than the corolla; corolla 4'-6' long, scarcely unfolding; legume 3-4-seeded.—Alpine. *Hall & Harbour*, 97; *Parry*, *Meehan*. Sangre de Cristo Pass, *Brandegee*. Mount Lincoln, Mount La Plata and Gray's Peak at 12,000 feet altitude, *Coulter*.

TRIFOLIUM PARRYI, Gr. *Sill. Jour. (N. S.)* 33, p. 409. Glabrous, circulose, subcaulescent; scape 3'-4' high, leafy at base; stipules ovate, scarious; leaflets oblong, ($\frac{1}{2}$ -1 $\frac{1}{2}$ ') sharply dentate; involucre scarious, 5-7-parted, much shorter than the many-flowered head; segments ovate, obtuse; calyx about thrice shorter than the persistent, rose-purple (6'-9') corolla, teeth broadly-subulate, about equaling the campanulate tube; flowers 20 or more in a head; legumes sessile, 3-4-seeded.—Alpine. *Hall & Harbour*, 98; *Parry*; *Meehan*. Common on the higher mountains, *Coulter*. Gray's Peak at 11,000 feet, *Redfield*.

TRIFOLIUM INVOLUCRATUM, Willd. Nearly erect, glabrous; slender, branching from the base, 10'-18' high; leaflets linear-lanceolate, mucronate, spinulosely-serrulate, 1'-1 $\frac{1}{2}$ ' long; stipules membranaceous, oblong-ovate, aristate, the upper ones pectinately dentate with setaceous teeth; the lowermost narrower and nearly entire; involucre laciniately many-cleft, a little shorter than the rather loose subhemispherical heads; heads 1' or more in diameter; flowers purple, tipped with white; teeth of the calyx longer than the tube and much shorter than the corolla, subulate from a very broad base; legume stipitate, 5-6-seeded.—Fremont County, *Brandegee*.

HOSACKIA¹ PURSHIANA, Benth. Much-branched, 6'-20' high, annual, erect, more or less hairy, sometimes softly villous; leaflets 3, (rarely 4,) ovate to lanceolate, rather acute; stipules minute, blackish; peduncles longer than the leaves, 1-flowered; bract simple; calyx deeply parted; corolla 3'-4' long, scarce exceeding the calyx, keel attenuated upward, falcate; petals rose-colored, the vexillum with deeper minute stripes; legume 1' or more long, straight, not attenuate above.—*Hall & Harbour*, 108.

PSORALEA LANCEOLATA, Pursh. Nearly glabrous, with a few scattered hairs and numerous dark-colored glands, erect, 10' high, much

¹ **HOSACKIA**, Dougl. Calyx tubular or somewhat campanulate, 5-cleft or toothed. Vexillum as long as the spreading wings, often distant from those of the other petals. Keel as long as the vexillum. Style subulate, usually somewhat straight. Stigma capitate. Legume somewhat compressed, wingless.—Herbs or suffrutescens plants (all American.) Stipules very minute, sometimes foliaceous. Peduncles axillary or umbellately 1-3 many-flowered; commonly with a 1-3-foliate bract below the flowers. *Torr. & Gr. Fl. N. Am.*

branched; leaves palmately 3-foliolate; leaflets $\frac{1}{2}$ '-1' long, linear-lanceolate or elliptical-oblong, rather obtuse, slightly mucronate, sessile; peduncles longer than the leaves; raceme short, 6-15-flowered; calyx-teeth minute, acute; corolla 3" long, bluish; legumes globose, sparingly hirsute, covered with larger dark-brown glands.—*Hall & Harbour*, 101; *Dr. Smith*; *B. H. Smith*. Very abundant on the plains around Denver and Colorado Springs, *Porter*.

PSORALEA DIGITATA, Nutt. Canescent, diffusely branched, branches slender; leaves 5-foliolate; leaflets cuneate-oblong and oblong-linear with an abrupt, rigid point, 1' long, 2"-4" wide, smooth and minutely dotted above, hirsute beneath, longer than the petioles; stipules lanceolate, reflexed; spikes short, interrupted, on very long peduncles, the clusters 3-6 flowered; flowers sessile; bracts obovate or reniform; calyx villous, half as long as the corolla, segments ovate, acuminate, the lowest one produced; vexillum roundish-obovate; legume orbicular-ovate, compressed, hirsute, not wrinkled; seeds ovate.—*Purgatory River*, *Dr. Bell*.

PSORALEA FLORIBUNDA, Nutt.—*Dr. Smith*; *B. H. Smith*; *Porter*. Abundant on the plains of the Platte, *Coulter*. *Hall & Harbour*, 102.

PSORALEA ARGYOPHYLLA, Pursh.—*Hall & Harbour*, 103; *Porter*.

PSORALEA CUSPIDATA, Pursh. (*P. cryptocarpa*, T. & G.) Stem 1^o-2^o high, terete, branched, canescent with appressed pubescence; leaves 5-foliolate; leaflets obovate or elliptical-oblong, 1'-1 $\frac{1}{2}$ ' long, obtuse or acutish, mucronate, about as long as the petiole, minutely dotted, pubescent; stipules subulate; peduncles much longer than the leaves; spikes ovate or oblong, flower-clusters crowded; flowers blue; bracts lanceolate, cuspidate, shorter than the flower; calyx large, somewhat inflated, gibbous at the base, conspicuously dotted, teeth triangular lanceolate, acuminate, two upper ones united to the middle, the lower one produced; legume ovate, membranaceous, scarcely pointed, not wrinkled, hid in the large calyx.—*Purgatory River*, *Dr. Bell*.

PSORALEA HYPOGÆA, Nutt. Acaulescent; root tuberous, oblong, edible, about 1' long; stemless, hirsute with whitish appressed hairs; leaves 5-7 foliolate; leaflets linear-lanceolate or linear-oblong, usually acute, 1'-1 $\frac{1}{2}$ ' long, 2"-3" wide, nearly glabrous above; spikes capitate, on peduncles much shorter than the petioles; bracts lanceolate; calyx cleft below the middle, segments linear, acuminate, the lowest lanceolate, elongated; corolla pale-blue; banner oblong, of the length of the wings and twice as long as the keel.—*Sandy plains of Northern Colorado*. Rare. *Greene*.

DALEA ALOPECUROIDES, Willd.—*Hall & Harbour*, 104; *Dr. Smith*; *Brandegee*.

DALEA LAXIFLORA, Pursh. Glabrous, 3^o-4^o high, erect, branched above; branches slender and spreading; leaflets 4-5 pairs, linear-oblong, 2"-3" long, $\frac{1}{2}$ " wide, strongly dotted; spikes paniced, few-flowered; flowers distant; bracts very broad, almost orbicular, glandular, coriaceous, glabrous, slightly cuspidate, embracing the flower; calyx deeply cleft, teeth long, setaceous, beautifully plumose; corolla white, keel twice as long as the wings, vexillum cordate, very small, sometimes with 4 approximated glands near the middle.—*Hall & Harbour*, 100.

DALEA NANA, Torr., var. *ELATIOR* Torr. *Pl. Wright*, 1, p. 46. Stems about 1^o high, canescent with appressed pubescence, branching; branches leafy to the top; leaves remote; leaflets 2-3 pairs, oblong and obovate, slightly apiculate, clothed with silky, canescent hairs, not dotted, 1 $\frac{1}{2}$ "-4" long; spikes ovate, loosely-flowered, elongated and cylindrical in

fruit, 1' long, on short peduncles or sessile on the ends of the leafy branches; bracts obovate, apiculate, about the length of the yellow flowers; calyx deeply cleft, teeth setaceous, plumose.—Purgatory River, *Dr. Bell*.—Closely allied to *D. aurea*, from which it differs in its diffusely spreading, slender stems, repeatedly branched and leafy to the spikes, which are smaller and much less dense.

DALEA JAMESII, Torr. Stems several from one root, 4'-9' high, somewhat woody at the base; whole plant silky-pubescent; leaves palmately tri-foliolate, not dotted with glands; leaflets obovate, very obtuse; stipules setaceous, erect, rigid, 4" long; petioles 6"-9" long; spikes oblong, sessile, dense and broad, about 1' long; bracts ovate, acuminate, longer than the calyx; calyx deeply cleft, segments setaceous, plumose, longer or shorter than the vexillum; flowers golden-yellow.—Cañon City, *Brandegee*.

PETALOSTEMON VIOLACEUS, Mx.—*B. H. Smith*. Colorado Springs *Porter*. Plains of the Platte, not as common as the following, *Coulter*.

PETALOSTEMON CANDIDUS, Mx.—Common on the plains. *Dr. Smith*; *Coulter*; *Porter*.

PETALOSTEMON MACROSTACHYUS, Torr. *Ann. N. Y. Lyc.*, 2, p. 176. Glabrous, stem 1^o-2^o high, branched, dotted, leaflets 2-3 pairs, lanceolate-oblong, obtuse, dotted beneath, $\frac{3}{4}$ " long, upper surface becoming deep verdigris-green in drying; spike cylindrical, elongated, 6 and more when old, the rachis villous; bracts lanceolate, as long as the flower; calyx silky-villous, teeth lanceolate; vexillum cordate; petals linear-oblong, narrowed at the base and nearly white; legume inclosed in the persistent calyx, gibbous, compressed, hairy.—*Hall & Harbour*, 105.

AMORPHA FRUTICOSA, L.—On the plains, along the Platte, *Coulter*. Pueblo County, *Redfield*.

AMORPHA CANESCENS, Nutt.—Plains, *Porter*.

ROBINIA NEO-MEXICANA, Gr. *Pl. Thurb.*, p. 314. Shrub 4^o-6^o high; stipular prickles subrecurved, sharp and stout; leaflets elliptical or oblong, $\frac{1}{2}$ '-1' long; peduncles and the short, crowded racemes hispid with straight glanduliferous hairs; calyx finely hispid, teeth subulate-lanceolate; corolla rose-color; pods glandular-hispid. Resembles in its flowers *R. viscosa*.—Cucharas River, Huerfano County, *Greene*.

ASTRAGALUS CARYOCARPUS, Ker.—*Hall & Harbour*, 132 and 133. *Brandegee*. On the plains and in South Park, *Porter*.

ASTRAGALUS MEXICANUS, A. DC.

ASTRAGALUS PLATTENSIS, Nutt. We have seen no specimens of this nor of the preceding species from Colorado, but from the range ascribed to them by *Dr. Gray* in his Revision, *Proc. Am. Acad.*, vol. 6, p. 193, they doubtless exist there.

ASTRAGALUS MOLLISSIMUS, Torr. *Ann. N. Y. Lyc.*, 2, p. 178. Perennial, subcaulescent, shining with a soft silky-villous, often yellow, pubescence; peduncles long, scape like; spikes dense; flowers rather large, violet; calyx tubular; pod cartilaginous, oblong, turgid, 5"-9" long, very smooth, subdidymous, ovary also glabrous; stipules lanceolate, free, cohering below the petiole; leaflets 11-14 pairs, ovate-oblong or oval, 1" long, obtuse, but slightly mucronate.—*Hall & Harbour*, 122. On the plains, scarce, *Dr. Bell*.

ASTRAGALUS CANADENSIS, L.—At the base of the foot-hills and along water-courses of the plains. *B. H. Smith*; *Porter*; *Brandegee*.

ASTRAGALUS ADSURGENS, Pall. (*A. striatus*, Nutt.) *Gray's Rev.*

Proc. Am. Acad., 7, p. 197. Perennial, cinereous with minute appressed pubescence, or glabrate; stems rather stout, 4'-18' high, ascending or decumbent, sulcate as well as the peduncles; stipules scarious, mostly united at base; leaflets 10 pairs, 6''-9'' long, oblong, or linear-oblong; peduncles long, stout, strict, strongly sulcate, often nearly equaling the leaves; spike dense, at length oblong or cylindrical; flowers purplish, medium-sized, ascending; calyx-tube rather long, campanulate, twice longer than the setaceous teeth, subvillous with light or dark hairs; pod coriaceous, pubescent, sessile, ascending, ovate-oblong, 4''-5'' long, straight, usually triangular-compressed, with a dorsal sulcus and two-celled by the intruded dorsal suture, many-ovuled.—*Hall & Harbour*, 135; *Canby*; *Brandegee*; *Porter*. Plains of the Platte, *Coulter*. Wet Mountain Valley, *Redfield*.

ASTRAGALUS HYPOGLOTTIS, L. *Gray's Rev. l. c.*, p. 197. Perennial, with a rather loose pubescence; stems 6'-2° long, slender, diffusely procumbent or ascending; stipules subfiliaceous, and more or less sheathing; leaflets 7-10 pairs, oblong, obtuse or retuse; heads few to many-flowered; corolla violet, $\frac{1}{2}$ ' long; legume ovate-triangular, softly, silky-villous with white hairs, very shortly stipitate and but 2-8 seeded.—*Hall & Harbour*, 139; *Canby*; *B. H. Smith*; *Porter*; *Brandegee*. Common on the plains and in the mountains, *Coulter*.

ASTRAGALUS BRANDEGEL, *Porter (n. sp.)* Canescent with minute appressed hairs; branching from a somewhat woody base, branches assurgent, 6' high; leaflets in 5 rather distant pairs, linear, obtuse, involute, glabrous above, 6''-8'' long; stipules lanceolate, acuminate, slightly adnate to the petioles; peduncles much longer than the leaves, slender, erect; flowers about 5, in a loose raceme, very small, $1\frac{1}{2}$ ''-2'' long; calyx turbinate, hairy, tube a little shorter than the subulate teeth; corolla white or cream-color, tinged with purple, banner exceeding the keel, reflexed; pod hairy, turgid, obovoid, with a shallow dorsal sulcus, 4''-7'' long, coriaceous, abruptly-pointed, short-stipitate, straight, ascending, twice the length of the slender pedicel, 2-celled or nearly so, many-seeded.

This new *Astragalus*, which belongs to Section 9, *Micranthi*, of Gray's Revision, is allied to *A. atratus*, Watson. I have named it in honor of the zealous collector from whom it was received.—Banks of the Arkansas, near Cañon City, *T. S. Brandegee*, June 26, 1873.

ASTRAGALUS DRUMMONDII, Dougl. *Gr. Rev. l. c.*, p. 200. Perennial, softly-villous; stem erect, 1°-2° high, stout, sulcate, very leafy; leaflets 10-15 pairs, oblong and linear-oblong, obtuse, narrowed at the base; stipules distinct, free, ovate, acuminate; peduncles longer than the leaves, erect, spikes loosely-flowered; flowers rather large, white or ochroleucous, with the point of the keel purple-tinged, pendulous and somewhat secund; calyx-teeth subulate, shorter than the tube, scarcely gibbous at base, pilose with blackish hairs; pod very smooth, stipitate, exerted from the calyx, pendulous, linear-oblong, coriaceous, straight, terete-biventricose, with a narrow, very deep sulcus, completely or incompletely divided by the intrusion of the dorsal suture.—*Hall & Harbour*, 124. Near Colorado Springs, *Porter*. Wet Mountain Valley, *Brandegee*. Plains near Denver, *Coulter*. Ula, Wet Mountain Valley, *Redfield*.

ASTRAGALUS SCOPULORUM, *Porter (n. sp.)* Pubescent with appressed hairs; stems ascending, about 1° high, angled, branching; stipules (especially the lower ones) somewhat coherent; leaflets 9-13 pairs, obovate or oblong, abruptly short-pointed, glabrous above; peduncles

strict, erect, longer than the leaves, loosely many-flowered; bracts scarious, subulate, longer than the pedicels; flowers yellow or ochroleucous, reflexed; corolla rather large, 9" long; calyx gibbous at base, pilose with blackish hairs, the subulate teeth scarce half as long as the cylindrical tube; pod over 1' in length, stipitate, exserted from the calyx, pendulous, oblong, becoming arcuate with age, sharply 3-angled, chartaceous, the dorsal suture salient, with an acute sulcus on each side, intruded half way to the ventral. This species must be referred to Sect. 11, *Galegiformes*, of Gray's Revision, and seems in many respects to fill an intermediate position between *A. Drummondii* and *A. racemosus*.—South Park, July 24, 1872, *Porter*. Wet Mountain Valley, 1873, *Brandegee*, in flower and fruit.

ASTRAGALUS RACEMOSUS, Pursh. *Gr. Rev. l. c.*, p. 200. Appressed-pubescent or glabrate; stem 1^o-2^o high, rather stout, somewhat sulcate, very leafy; stipules distinct, free; leaflets in about 10 pairs, elliptical-oblong or oval, obtuse, mucronate, 6"-8" long; peduncles about the length of the leaves, loosely many-flowered; flowers nodding and somewhat secund; calyx strongly gibbous at base, whitish-puberulent, the setaceous teeth slightly shorter than the tube, equaling the stipe; pod lance-oblong, 1' long, three-angled, not 2-celled, cross section somewhat equally tri-radiate, very smooth. Leaflets glabrous above.—*Hall & Harbour*, 113. Wet Mountain Valley, *Brandegee*.

ASTRAGALUS GRACILIS, Nutt. *Gr. Rev. l. c.*, p. 202. Erect, slender, pubescent; stems virgate, 1^o high or more from a very long, sweet root; leaflets very narrowly linear, almost filiform, 7"-10" long, obtuse or retuse, 5 to 8 pairs; lower stipules somewhat united, the rest distinct; raceme spike-like, many-flowered, long-peduncled, virgate; flowers 3" long, pale purple, recurved-spreading; pods spreading, 2"-3" long, coriaceous, strongly concave on the back, white hairy, at length glabrous, transversely rugose-veined, elliptic-ovate, 1-celled, ventral suture thick and subacute.—Plains of Eastern Colorado, *Dr. Bell*.

ASTRAGALUS MICROLOBUS, Gr. *Rev. l. c.*, p. 203. (*A. gracilis*, Torr. in *Ann. N. Y. Lyc.*, p. 179.) Cinereous-pubescent; stems erect and ascending, about 1^o high; leaflets linear or oblong-linear, emarginate, 4"-6" long; racemes rather short and usually loosely flowered; flowers deep purple, 4" long; pods reflexed, thick, cartilaginous, puberulent, finely rugulose, turgid, a little flattened on the back, the ventral suture very thick.—*Hall & Harbour*, 119; *Brandegee*.

ASTRAGALUS ABORIGINUM, Richards. *Gr. Rev. l. c.*, p. 208. Perennial hoary-pubescent or subvillosa; stems numerous, rigid, ascending, $\frac{1}{2}$ ^o-1^o high; stipules triangular, for the most part free; leaflets 3-6 pairs, linear or oblong-lanceolate, acute; peduncles exceeding the leaves; flowers small (3"-5" long) in a compact raceme, white or tinged with violet; calyx-teeth filiform-subulate, a little shorter than the tube; legume long-stipitate, reflexed, somewhat membranous, glabrous, laterally subcompressed, (cross-section oval,) straight dorsally, the ventral suture arcuate, 1-celled with a very narrow rudimentary septum on the dorsal side, 10-15-ovuled.—Not seen by us, but reported from the Rocky Mountains of Colorado by *Watson* in *King's Rep.*, vol. 5, p. 70.

ASTRAGALUS IODANTHUS, Watson. *King's Rep.*, v. 5, p. 70. Perennial, canescent with an appressed hairy pubescence, or nearly glabrous; stems decumbent, 6'-10' long; stipules ovate-lanceolate, free or somewhat adnate to the petiole; leaflets 6-10 pairs, 2"-5" long, obovate or orbicular, obtuse; peduncles equaling or shorter than the leaves; spikes

short, dense; flowers on short pedicels, deep violet-purple, or ochroleucous tinged with purple, the wings and banner (6'-8' long) exceeding the obtuse keel, the somewhat nigrescent campanulate calyx-tube twice longer than the subulate teeth; legume 1½' long, 3" broad, linear-oblong, acuminate, strongly arcuate or hamate, sessile, nearly glabrous with a very sparse pubescence, mottled, chartaceous, irregularly forked but usually with a deep dorsal sulcus approximating the suture to the prominent ventral one, dorsal septum none, many-seeded.—Clear Creek Cañon, *Coulter*.

ASTRAGALUS GALBRIUSCULUS, Gr. *Rev. l. c.*, p. 204. Glabrous or slightly hairy; stem erect, nearly simple, striate; leaflets 5-6 pairs, narrower than the preceding, green, linear-lanceolate, subacute, or oblong and obtuse at both ends; ovary very smooth; pod lanceolate, subfalcate, attenuate into a stipe 2-3 times exceeding the calyx; otherwise like the last, of which it is probably only a variety.—*Hall & Harbour*, 116. South Park, *Porter*. Rare.

ASTRAGALUS OROBOIDES, Hornem., var. *AMERICANUS*, Gr. *Rev. l. c.*, p. 205. Subcinereous-puberulent; stems suberect, 1^o-1½^o high; leaflets 5-7 pairs, oblong and oval, or often linear-oblong, scarcely retuse; flowers 3'-4' long, violet or deep purple, the wings exceeding the keel; pod 5'-6' long, 3 or 4 times longer than the calyx, moderately sulcate, few-seeded; stipe very short.—*Hall & Harbour*, 117. "Along the bank of streams, at middle elevations and subalpine." Mt. Lincoln at 12,000 feet altitude, *Coulter*.

ASTRAGALUS ALPINUS, L.—Alpine and subalpine.—*Hall & Harbour* 125; *Dr. Smith*; *Brandege*. South Park, *Porter*. Mt. Lincoln at 13,000 feet altitude, *Coulter*.

ASTRAGALUS SPARSIFLORUS, Gr. *Rev. l. c.*, p. 205. Slightly appressed-pilose or glabrate; stems 1^o or more in length with many slender branches, diffuse; stipules triangular-subulate, distinct; leaflets 4-6 pairs, obovate or subrounded, often emarginate, 2"-3" long; peduncles scarcely exceeding the leaves, 3-10 flowered; flowers 3" long, bluish-white, the emarginate or bifid banner and the wings much exceeding the incurved keel; calyx-teeth equaling the tube; ovary 8-12-ovuled, short-stipitate; pod 3"-6" long, coriaceous, oblong, incurved, pubescent with short hairs, mottled, 2-celled to the middle, very short stipitate, ventral suture acute.—*Hall & Harbour*, 128. Oak Creek, Fremont County, *Brandege*.

ASTRAGALUS LOTIFLORUS, Hook. *Gr. Rev. l. c.*, p. 208. Hoary or cinereous with appressed hairs; stems very short; leaves lance-oblong; peduncles exceeding the leaves or very short; heads few-flowered; flowers yellowish; calyx-teeth subulate, exceeding the tube; pod about 1' long, oblong-ovate, inflated, sub-canescens, the cross-section obovate, retuse or usually broadly orbicordate toward the base.—*Hall & Harbour*, 131. Near Denver, *Coulter*.

ASTRAGALUS PUBENTISSIMUS, T. & G. *Gr. Rev. l. c.*, p. 209. Dwarf, hirsute-canescens with a loose pubescence, many-stemmed from an annual or biennial root; leaflets oblong or obovate; flowers few, rather small, purplish-white, subracemose upon a short peduncle, calyx-teeth equaling the campanulate tube; pod villous, 9'-10' long, inflated, membranaceous, ovate-lunate, strongly incurved, sulcate on the back with a slight inflexion of the suture. "Colorado Territory, near the sources of the Colorado of the West. Found only by Nuttall."

ASTRAGALUS MISSOURIENSIS, Nutt. *Gr. Rev. l. c.*, p. 210. Subcanescent, hoary-silky with a short, very closely appressed pubescence; usu-

ally prostrate or matted; peduncles scape-like, capitate few-flowered or spicately 8-14 flowered; calyx-teeth about half shorter than the cylindrical tube; leaflets 5-10 pairs, elliptical and obovate-elliptical; corolla bright violet (or rarely white;) pod thick, coriaceous, obcompressed, nearly straight, about 1' long, blackish, elliptic, transversely rugulose.—*Hall & Harbour*, 127. Purgatory River, *Dr. Bell*. Cañon City, *Brandegee*.

ASTRAGALUS SHORTIANUS, Nutt. *Gr. Rec. l. c.*, p. 210. Usually subcaulescent, silky-canescens with a very closely appressed pubescence; leaflets obovate or ovate, 7"-10" long; peduncles scape-like few-many flowered, commonly shorter than the leaves; calyx 6" long, cylindrical, teeth shorter than the tube; corolla violet or blue, rather large and showy; pod 1'-2' long, ovate or ovate lanceolate, thick, coriaceous, obcompressed, intruded dorsal suture approaching the ventral, not 2-celled, transversely rugulose, pointed and strongly arcuate, thick, more or less pubescent.—*Hall & Harbour*, 126 (*A. cyanus*, Gr.) *Brandegee*. Clear Creek Cañon, *Coulter*.

ASTRAGALUS PARRYI, Gr. *Rec. l. c.*, p. 211. Stem short, prostrate, villous with loose spreading hairs; leaflets 7-13 pairs, obovate or oblong, 3"-9" long; peduncles rather short; flowers 6-10, loosely subcapitate, 6"-10" long, whitish or yellowish, the keel tinged with purple; calyx-teeth half shorter than the cylindrical tube; pod pubescent, oblong-lanceolate, 1' longer or more, arched or at length circinate, obcompressed, rugulose, both sutures sulcately impressed, contiguous, —*Hall & Harbour*, 123; *Brandegee*. Near Denver, *Coulter*. Specimens from *Brandegee* have the assurgent stems from 8'-10' long, with 2-3 peduncles from the axils of the leaves.

ASTRAGALUS TRIFLORUS, Gr. *Rec. l. c.*, p. 214. Annual, cinereous-pubescent, very much branched from the base, branches ascending, 6"-12' high; stipules acuminate, slightly adhering at base; leaflets 5-7 pairs, oblong or linear-oblong often truncate at the apex and retuse, 4"-8" long; peduncles in fruit, exceeding the leaves; flowers 3-15, ochroleucous, tinged with purple, small, about 3" long; calyx-teeth subulate, equaling the tube; pod sessile or on a short pedicel, membranous, inflated, oval, obtuse or acutish 7"-12" long, finely reticulated, pubescent, neither suture inflexed, dorsal sulcus deep and narrow, many-seeded.—*Cañon City*, *Brandegee*.

ASTRAGALUS PICTUS, Gr. *Rec. l. c.*, p. 214. Root filiform; hoary with a loose silky pubescence; stipules rigid, persistent, connate; leaflets 3-7 pairs, narrowly linear or filiform, 6"-18" long, most of them usually abortive; flowers few, rather small; keel with the inflexed apex somewhat produced, pale rose-colored; pod 6"-18" long, mottled with purple blotches, ovoid, short stipitate, stipe equaling the calyx, scarcely pointed, pendent.

Var. **FILIFOLIUS**, Gr. *l. c.*, p. 215. (*A. filifolius*, Gr.) Leaves usually imperfect; leaflets very few, mostly attenuated, 1'-1½' long, terminal one, or the filiform rachis produced, persistent; legume 1'-1½'.—On the plains. *Hall & Harbour*, 138. Denver and Colorado Springs, *Porter*.

ASTRAGALUS FRIGIDUS, Gr. *Rec. l. c.*, p. 219. Subglabrous, erect, 10-20" high; stipules ovate-oblong, membranous, hairy; leaflets 7-9 pairs, ovate-oblong or elliptic-oblong, green; peduncles equaling the leaves; calyx-teeth short; corolla white; pod oblong, acute at each end, black-hairy or glabrous, 1-celled, the stipe equaling or exceeding the calyx.—"Subalpine, in wet pine woods." *Hall & Harbour*, 137.

ASTRAGALUS LONCHOCARPUS, T. & G. *Gr. Rec. l. c.*, p. 219. (*Phaca*

macrocarpa, Gr. *Pl. Fendl.*, p. 36.) Ashy-puberulent, glabrate, perennial; stem fistulous, sulcate, branched, 2° long; stipules distinct, small; leaflets 1-5, linear or filiform-linear, remote, the leaf sometimes reduced to the flattened filiform rachis; racemes loosely many-flowered, on long, strict, stoutish peduncles; bracts one-half shorter than the pedicels; flowers white, pendent; calyx-teeth broad-subulate, much shorter than the tube; pod membranous, lanceolate-cylindrical, straight, 1'-1½' long, very sharply acuminate at each end, exsertly stipitate, glabrous, neither suture intruded.—Wet Mountain Valley, *Brandegee*.

ASTRAGALUS LEPTALEUS, Gr. *Rev. l. c.*, p. 220. Nearly glabrous, stem slender, ascending, a span high; stipules long-subulate, subconnate at base; leaflets 7-11 pairs, lance-linear or oblong, often acute; peduncles 2-4 flowered, shorter than the leaves; calyx with short, black hairs, the campanulate tube slightly exceeding the subulate teeth, about equaling the pedicel and subulate bract; corolla 4" long, white, the emarginate banner a third longer than the violet-tipped keel; pod ovate or oval, 4" long, puberulent, chartaceous.—*Hall & Harbour*, 141; *Brandegee*. Sierra Madre Range, *Coulter*.

ASTRAGALUS BISULCATUS, Gr. *Rev. l. c.*, p. 221. Perennial, strigulose-puberulent; stem erect, over 1° high, stout; stipules distinct, free; leaflets oblong, often narrow, the lowest near the stem; flowers violet, in dense, spike-like racemes, middle sized, pendent or spreading, keel nearly straight; calyx-teeth setaceous, scarcely shorter than the campanulate tube; pod coriaceous, ½' long, shortly exsert-stipitate, straight, oblong, semi-cylindric, the deeply concave ventral surface divided by the salient, obtuse suture.—*Hall & Harbour*, 130. Platte River, *Coulter*.

ASTRAGALUS PECTINATUS, Dougl. *Gr. Rev. l. c.*, p. 221. Perennial, 1° high; stem and leaves rather rigid, ashy-puberulent, glabrate; branches striate, angled; leaflets 4-10 pairs, nearly filiform, not jointed to the rachis, persistent; lower stipules connate; flowers nearly 1' long, white, many, in a rather short raceme; keel nearly straight, banner elongated; pod thick, cartilaginous, subovate or oblong, turgid, sessile or short-pedicelled, neither suture intruded, but both thick and prominent, 6" long, pendulous, glabrous, cuspidate.—*Hall & Harbour*, 134; *Canby*; *Dr. Bell*.

ASTRAGALUS FENDLERI, Gr. *Rev. l. c.*, p. 224. Perennial, glabrous, or appressed-puberulent, erect, over 1° high; leaflets oblong or linear-oblong; racemes long-peduncled, loosely flowered; flowers purple; pod oval, inflated, chartaceous-coriaceous, about 1' long, straight, pointed, minutely puberulent, very shortly stipitate.—In New Mexico and Colorado according to Gray's Revision, but not seen by us.

ASTRAGALUS HALLII, Gr. *Rev. l. c.*, p. 224. Subcinereous-pubescent, glabrate; stems rather stout, ascending; stipules subulate; leaflets 9-12 pairs, narrow, oblong, 4"-7" long, subcuneate, retuse; peduncles exceeding the leaves; flowers violet, 20 or more in a dense head-like raceme; calyx dark-pubescent, broad-campanulate, very gibbous at base, 3" long, the rather obtuse, broad teeth, 3-4 times shorter than the tube; pod oblong, inflated, 7"-10" long, glabrous, straight, pointed, chartaceous-coriaceous; stipe, 1" long.—*Hall & Harbour*, 121; *Canby*. Twin Lakes, *Coulter*. South Park, *Porter*.

ASTRAGALUS FLEXUOSUS, Dougl. *Gr. Rev. l. c.*, p. 224. Ashy-puberulent; stems ascending, 1° high, flexuose; leaflets oblong or cuneate-linear, obtuse or retuse; peduncles exceeding the leaves; racemes mostly elongated, loose; flowers 4" long, white or purplish; calyx hoary-

pubescent, teeth 3 times shorter than the tube; pod cylindrical, 8'-11' long, 2' broad, puberulent, thinly coriaceous, straight or sub-incurved; stipe very short but evident.—Common at middle elevations. *Hall & Harbour*, 118; *Dr. Smith*; *Canby*; *Porter*; *B. H. Smith*; *Brandege*; *Meek*; *Coulter*.

ASTRAGALUS MULTIFLORUS, Gr. *Rev. l. c.*, p. 226. (*A. nigrescens*, Gr.) Perennial, somewhat glabrous; stems 1° high, numerous, ascending, branched; stipules dark-colored, the lower ones at least sheathing; leaflets 6-10 pairs, 3'-6' long, linear or narrowly oblong, acute or obtuse; peduncles not exceeding the leaves, loosely few-flowered; flowers ochroleucous, tinged with purple, small, 2'-3' long, the campanulate calyx-tube rather longer than the setaceous teeth, and about equaling the stipe; pod vetch-shaped, flattened or compressed, straight, margined by the nerve-like sutures, 4'-6' long, reflexed, 1-celled, 2-4-seeded.—*Hall & Harbour*, 115. South Park, *Porter*. Sierra Madre Range, *Coulter*.

ASTRAGALUS CAMPESTRIS, Gr. *Rev. l. c.*, p. 229. Perennial, minutely pubescent or glabrate; stems 3'-15' high, numerous, ascending, slender, simple; stipules, at least the lower ones, membranous and sheathing, large, acuminate; leaflets 5-9 pairs, 3'-15' long, linear, linear-lanceolate or oblong, usually acute; peduncles slender, exceeding the leaves, 5-10-flowered, flowers sub-capitate or scattered, 4' long, ochroleucous, tinged with purple, the keel with a purple, long and narrow inflexed tip; pod 6'-12' long, chartaceous, not stipitate, sub-puberulent, subcompressed, oblong-linear, nearly straight, valves sub-turgid, the pedicels at length reflexed, 1-celled, 10-15-ovuled.—*Meek*, Ute Pass, and on the Upper Arkansas, *Porter*. Mount Lincoln, *Coulter*.

ASTRAGALUS DECUMBENS, Gr. *Rev. l. c.*, p. 229. (*Homalobus decumbens*, Nutt.)—Cinereous or silky-pubescent; stems diffuse or ascending, 6'-10' high; petioles sometimes somewhat flattened, mostly with 7-13 linear-lanceolate, acute leaflets; racemes 5-10-flowered; calyx-teeth attenuate, a little shorter than the tube; corolla 4'-4½' long, ochroleucous or purplish; keel with a short, inflexed tip; pod broad-linear, straight or falcate, about 1' long, hoary-puberulent.—*Hall & Harbour*, 142. Idaho Springs, *Redfield*.

ASTRAGALUS DIVERSIFOLIUS, Gr. *Rev. l. c.*, p. 230. Ashy-strigulose; stems diffuse, decumbent, elongated, about 1° high; petioles short, flattened, 1-3 foliolate; terminal leaflet or simple leaf linear, elongated, 1'-2', attenuated at each end; peduncle 1-5-flowered; calyx-teeth half shorter than the tube; corolla ochroleucous or lurid, keel falcate-incurved; legume oblong-linear, straight or subfalcate, ¾' long, canescent-puberulent.—"Gravelly plains of Colorado on both sides of the Rocky Mountains," *Gray's Revision*.

ASTRAGALUS JUNCEUS, Gr. *Rev. l. c.*, p. 230. Perennial, minutely pubescent or subglabrous; stems usually solitary, erect, paniculately-branched, slender; stipules small; petioles slender, sometimes 6' long, usually naked or with 1-5 pairs of linear leaflets; peduncles longer than the leaves, 3-7-flowered; flowers 4' long, distant, ochroleucous or tinged with violet; calyx teeth usually small and obtuse, shorter than the campanulate tube; pod 1'-1½' long, as in the last species, with which it is probably identical.—"On the head-waters of the Colorado of the West," *Parry*.

ASTRAGALUS SIMPLICIFOLIUS, Gr. *Rev. l. c.*, p. 231. (*Phaca simplicifolia*, Nutt.) Perennial, caespitose, in dense, cushioned mats; leaves 4'-5' long, hoary with an appressed silky pubescence, simple, linear or

spatulate-lanceolate, acute, frequently involute, crowding the extremities of the usually short ($\frac{1}{2}$) branches; scapes scarcely exceeding the leaves, 2-3-flowered; flowers 3" long, purple, the banner and the wings longer than the strongly arched keel; calyx-teeth nearly equaling the obconical tube; legume 4" long, half included in the calyx, oblong, acute, sub-compressed, glabrous, thick and coriaceous, 1-celled, the ventral suture straight and very acute, the dorsal gibbous, about 12-ovuled.—"Found by Nuttall near the sources of the Platte."

ASTRAGALUS KENTROPHYTA, Gr. *Rec. l. c.*, p. 231. Perennial, intricately branched from a long root, broadly-depressed-caespitose, hoary with a short, silky pubescence; stems 2'-4' long; stipules membranous, mostly connate, often setaceous or spinosely acuminate; leaflets 2-3 pairs, 2'-4" long, linear-subulate, usually rigid and divaricate, pungent, not jointed with the rachis; flowers 1-3, on short pedicels in the axils of the leaves, 2" long, ochroleucous or tinged with violet; calyx-teeth setaceous, equaling the campanulate tube; pods 2'-3" long, sub-chartaceous, compressed, sessile, pubescent, ovate, acuminate, somewhat incurved, 1-celled, 3-4-ovuled, 1-2-seeded, the valves separating at maturity.—*Hall & Harbour*, 106; *Canby*; *B. H. Smith*, South Park, *Porter*; *Brandege*.

ASTRAGALUS TRIDACTYLICUS, Gr. *Proc. Am. Acad.*, v. 6, p. 527. Perennial, caespitose from a short woody caudex, dwarf, 2'-3' high, silvery-silky; leaves pinnately 3-foliate, long-petioled, exceeding the sessile, crowded flowers; leaflets oblanceolate, 6" long, acute; flowers 5" long, pale purple; calyx-teeth equaling the tube; pod globose, ovoid, 3'-4" long, very turgid, puberulent, 12-ovuled, 3-4-seeded; calyx deciduous, exposing the pod.—*St. Vrain Cañon*, May 26, *Coulter*.

ASTRAGALUS SERICOLEUCUS, Gr. *Rec. l. c.*, p. 232. Very broadly caespitose, silky-hoary; stems branched, prostrate; branches covered with the villous stipules; leaves all 3-foliate, not equaling the 2-6-flowered, filiform peduncles; leaflets 3" long, oblanceolate or cuneate-oblong; calyx-teeth about equaling the campanulate tube; corolla purple, 3'-4" long; pod ovate-oblong, 3" long, hoary, half included in the calyx.—*Sand-hills along the Platte*, *Hall & Harbour*, 145.

OXYTROPIS MULTICEPS, Nutt. Canescently-silky, 1'-3'-high; stems matted-caespitose, from a branching caudex; leaflets 3-4 pairs, oval, 3" long; flowers purple, 6" long; fruiting calyx inflated, globose, including the ovate, chartaceous-membranous pod; pod short-stipitate, sometimes half 2-celled by the intrusion of the ventral suture.—"Subalpine and lower." *Hall & Harbour*, 144; *Parry*, 191. *Boulder Cañon*, *Coulter*.

OXYTROPIS URALENSIS, L., var. *PUMILA*, Ledeb. Acaulescent, silky-villous; leaflets 4-5 pairs, conjugate, 3" long, oblong-linear, revolute; stipules long-adsate; scapes 1'-2' long, 2-5-flowered; flowers violet-blue; pod oval-oblong or long-oblong, ventral septum extending to the dorsal suture.—*High alpine*. (*O. arctica*, *R. Br.*,) *Hall & Harbour*, 143. *Mount Lincoln* at 14,000 feet elevation, *Coulter*.

OXYTROPIS CAMPESTRIS, L.—*Parry*.

OXYTROPIS LAMBERTI, Pursh.—Very abundant on the plains and in the mountains. *Hall & Harbour*, 140; *Dr. Smith*; *B. H. Smith*; *Canby*; *Meehan*; *Porter*; *Brandege*; *Coulter*.

OXYTROPIS NANA, Nutt. *Gr. Proc. Am. Acad.* 6, p. 236. Caespitose, much divided, silky-canescens with a very close, appressed pubescence; leaves very crowded; leaflets 3-4 pairs, obovate, 3" long; scapes 2'-3' high, scarcely exceeding the leaves, 3-12-flowered; flowers capitate,

rather large, blue; pod oblong, somewhat falcate, hairy, the ventral septum extending to the dorsal suture, 6-8-seeded.—Northern Colorado, on the authority of Nuttall. The characters of the fruit are drawn from specimens collected by Mr. Coulter in 1872 on Henry's Fork of Snake River.

OXYTROPIS SPLENDENS, Dougl. Acaulescent, silvery, silky-villous throughout, 6'-12' high; leaflets somewhat verticillate, 3-6 together, very numerous, lanceolate, very acute, usually 5"-10" long; flowers in an oblong spike, erect, spreading, usually deep blue; peduncles exceeding the leaves; flowers not much surpassing the calyx; pod ovate, erect.—*Hall & Harbour*, 135; *Parry*; *Canby*; *Porter*; *Brandege*. St. Vrain Cañon and South Park, *Coulter*.

OXYTROPIS DEFLEXA, DC. Caulescent or subcaulescent; more or less silky-villous; stems ascending, 6'-9' long, leaflets ovate-lanceolate, 14-17 pairs; peduncles very much elongated, scape-like; upper stipules, at least, adnate at the base, large, lanceolate, acuminate; flowers bright blue, about 4" long, rather small, with a short calyx-tube, spreading, spicate or capitate; pods oblong, straight, pointed, 6"-9" long, pubescent, usually reflexed.—Middle elevations. *Hall & Harbour*, 120; *Parry*, 433; *Canby*; *Meehan*. South Park, *Porter*; *Brandege*. Twin Lakes and Sierra Madre Range, *Coulter*.

Var. (†) Villous with spreading hairs, dwarf, acaulescent; leaves, including the petiole, 1½'; leaflets in about 11 pairs, ovate, 2"-3" long; peduncles 2' long; flowers 6-8, capitate; fruit not seen.—Horse Shoe Mountains, at 11,000 feet altitude, *Coulter*.

SOPHORA¹ SERICEA, Pursh. Herbaceous, low, 6'-12' high, more or less silky-canescenscent; stems ascending or decumbent, branching from the base; leaflets about 21, elliptic or cuneate-oval, 2"-3" long; racemes terminal, short, at first scarce exerted beyond the leaves, short, 1½'-2' long, peduncled; calyx gibbous at base, longer than the pedicels, campanulate, 5-toothed, teeth obtuse half the length of the tube; corolla 4" long, banner reflexed, petals of the keel nearly distinct, acuminate, mucronate.—*Hall & Harbour*, 146; *Dr. Smith*. Abundant on the plains around Denver, *Porter*. Ute Pass and Clear Creek Cañon, *Coulter*. Lower branches elongated and far exceeding the fruiting racemes. Colorado Springs, *Redfield*.

GLYCYRRHIZA LEPIDOTA, Nutt.—*Hall & Harbour*, 147; *B. H. Smith*; *Porter*. Plains of the Platte, *Coulter*.

HEDYSARUM MACKENZII, Richards. Stems 2° high, sub-erect, minutely pubescent, simple or branched; stipules, at least the lower ones, connate; leaflets 5-8 (usually 5) pairs, canescenscently pubescent, oblong or lanceolate, nearly glabrous above; racemes loosely 7-30-flowered, elongating in fruit; flowers large, 6"-9" long, light purple, keel exceeding the banner and wings; calyx-teeth subulate, about the length of the tube; legume 2-4-jointed, minutely pubescent.—Cañon City, *Brandege*. Sierra Madre Range, *Coulter*.

¹ **SOPHORA**, Linn. Calyx broadly-campanulate, obliquely truncate or somewhat 5-toothed at the summit, often somewhat turbinate or obconic at the base. Vexillum obovate or roundish, about the length of the other petals; keel obtuse, nearly straight, the petals somewhat united below the apex. Ovary nearly sessile, linear; ovules numerous; style nearly straight or incurved; stigma minute. Legume moniliform, indehiscent, (dry or fleshy,) not winged. Radicle usually inflexed or incurved.—Trees, shrubs, or sometimes herbaceous plants, with unequally pinnate leaves. Stipules subulate or none. Racemes axillary or terminal, sometimes paniculate. Bracts subulate, minute, often caducous. *T. & G. Fl. N. Am.*

VICIA AMERICANA, Muhl.—Common along mountain streams. *Porter & Coulter*.

VICIA TRUNCATA, Nutt. *T. & G. Fl. N. Am.* 1, p. 270. Somewhat pubescent. Stem 1^o-2^o high; leaflets 5-6 pairs, oblong-linear, usually truncate-serrate or tridentate at the apex, apiculate, about 1' long, 1'-2" wide; stipules lunate, incisedly-serrate; peduncles 4-7-flowered, rather shorter than the leaves; lower teeth of the calyx lanceolate, acuminate, upper ones very short; style villous at the apex; legume 1' or more long. Our plant varies from Nuttall's description only in the shorter and broader leaflets; flowers 9" long.—Cañon City, *Brandegee*.

VICIA MICRANTHA, Nutt. Glabrous, stem 2^o-3^o long, strongly angled, climbing; leaflets 6-12, 6'-9" long, 2" wide, oblong-elliptical, obovate or linear-oblong, obtuse or emarginate, mucronate; stipules subulate and simple or semi-sagittate, small; peduncle about 2-flowered, at first much shorter than the leaves; flowers small, rarely solitary, pale, blue at the tip; calyx hairy, teeth subulate, shorter than the tube; legume $\frac{3}{4}$ ' long, 3" wide, saber-shaped, glabrous, 5-6-seeded; seeds compressed, dark brown.—Cañon City, *Brandegee*. Golden City, *Greene*.

LATHYRUS ORNATUS, Nutt. Erect, glabrous, often glaucous; stem 6'-1^o high, sometimes branched, quadrangular; leaflets 3-4 pairs, lanceolate-linear, acute, mucronate, rigid and strongly veined, tendrils scarcely any; stipules linear-lanceolate and slender, semi-sagittate, entire; peduncles about 4-flowered, longer than the leaves; flowers large, purple, 1' long, very showy; calyx-teeth subulate, slightly unequal, rather shorter than the tube; pod smooth, flat, acuminate at each end.—*Hall & Harbour*, 109. On the plains.

LATHYRUS LINEARIS, Nutt. Nearly glabrous, low; stem decumbent, slender, angled; leaves nearly sessile; leaflets 5-6 pairs, narrowly-linear, 8'-12" long, $\frac{1}{2}$ "-1" wide, mostly obtuse, apiculate, rigid; tendril short, simple or bifid; stipules small, lanceolate, semi-sagittate, lacinate with 2-5 very sharp, slender teeth; peduncles 3-4-flowered, shorter than the leaves; flowers rather large, pale-purple; segments of the calyx triangular, shorter than the tubes; legume attenuate at each end.—*Hall & Harbour*, 110. Near Denver, *Dr. Smith*.

LATHYRUS POLYMORPHUS, Nutt. Mostly glabrous; stem erect, a little woody at the base, much branched, a little quadrangular, about 1^o high; leaflets 2-5 pairs, elliptical-lanceolate, somewhat glaucous, rigid, strongly veined, petioles terminated by a small bristle; stipules lanceolate, subfalcate, semi-sagittate at base; peduncles 3-5-flowered, rather shorter than the leaves; flowers large, purple; segments of the calyx broadly or narrowly subulate, somewhat unequal, shorter than the tube; legume large, glabrous.—*Hall & Harbour*, 111. Sierra Madre Range, *Coulter*.

LATHYRUS PUBESCENS, Nutt. (?) (*L. venosus*, Muhl., var. *?* *Torr. & Gr. Fl. N. Am.* 2, p. 174.—"Smaller, finely pubescent; leaflets 3-5 pairs, ovate-elliptical, smaller; stipules linear-lanceolate; peduncles 5-7-flowered.")—A *Lathyrus* collected by Mr. Brandegee, on Newlan Creek, S. Colorado, June 13, 1873, accords in the main with the variety or species described above. Its characters are: Erect, 1^o-2^o high, softly and finely pubescent throughout; leaflets 3-5 pairs, ovate, mucronate, strongly veined; tendrils simple or bifid; stipules semi-sagittate, much smaller than the leaflets; peduncles shorter than the leaves, and bearing 2 rather small, white flowers. Legumes not seen.

LATHYRUS PALUSTRIS, L. *Gray's Manual*, p. 139.—*Hall & Harbour*, 112. Plains of the Platte, *Coulter*. Cañon City, *Brandegee*.

HOFFMANSEGGIA¹ JAMESII, T. & G. *Fl. N. Am.*, p. 393. Canescently-pubescent; low, much branched from a shrubby base; stipules subulate, entire; pinnae 5, abruptly 10-16 foliolate; leaflets oval, obtuse at both ends, nearly glabrous above; racemes elongated, opposite the leaves; flowers nodding or reflexed, rather large; calyx a little oblique, the four upper segments lanceolate, acute, all membranaceous, at length deciduous from the persistent base; petals not glandular at the base, the upper one smallest, marked with reddish spots; filaments declined, hairy below, all fertile; style subulate, dilated above and somewhat gibbous at the apex; legumes about 1' long, broadly oblong, more or less lunate, scabrous, flat, 2-3 seeded, sprinkled, as well as the leaves, calyx, and petals, with sessile black glands.—On the plains of Eastern Colorado, *Dr. Bell*.

HOFFMANSEGGIA DREPANOCARPA, Gr. *Pl. Wright.*, 1, p. 58. Minutely cinereous-puberulent, wholly destitute of glands; stems numerous, 1'-8' high, springing from a thick, ligneous root 6'-8' deep; stipules and bracts ovate-acute, caducous; pinnae 3-5 pairs, besides the terminal one; leaflets 7-10 pairs, about 3' long, crowded, subfalcate, nerveless; racemes loose-flowered, elongated, on long, slender, axillary peduncles; calyx 3' long, persistent, its divisions oblong-lanceolate, obtuse or acutish; petals yellow, a little longer than the calyx, broadly obovate, very obtuse, nearly alike, without claws, naked and glabrous; filaments equal, antheriferous, villous-barbate below the middle; ovary smooth; pod broad-linear or oblong, very obtuse at each end, strongly falcate, flat, 1½'-2' long, following the strong curvature, 3'-5' wide, of exactly the same width throughout, glabrous or minutely puberulent under a lens, 9-10-seeded; valves chartaceous, finely reticulated, transversely impressed between the seeds.—Cañon City, *Brandegee*.

CASSIA CHAMÆCRISTA, L.—Near Denver, *Porter*.

SCHRANKIA UNCINATA, Willd.—On the plains, *Porter*.

ROSACEÆ.

PRUNUS AMERICANA, Marsh.—Near Denver, *Dr. Smith*.

PRUNUS CHICASA, Mx. ?—Cañon City, *Brandegee*.

PRUNUS PENNSYLVANICA, L.—*Hall & Harbour*, 148; *Porter*.

PRUNUS VIRGINIANA, L.—*Hall & Harbour*; *Brandegee*; *B. H. Smith*.
South Park and Mountain of the Holy Cross, *Coulter*.

SPIRÆA OPULIFOLIA, L.—*Meehan*. Platte River, *Coulter*.

VAR. PARVIFOLIA, Gr. Much smaller in all its parts.—*Hall & Harbour*, 150; *Brandegee*.

SPIRÆA DUMOSA, Nutt. (*S. arifolia*, Smith, var. *discolor*, T. & G.) A branching shrub, 2°-5° high; leaves broadly ovate, cuneate and petioled, obtuse, sublobate and dentate, scarcely mucronate, paler and sericeous beneath, smoother or nearly glabrous above, 6'-12' long; flowers numerous, in more or less branched terminal panicles; branches

¹HOFFMANSEGGIA, CRY. Sepals 5, united into a short, obconic base, somewhat equal. Petals 5, obovate, on short claws, somewhat unequal, spreading, the upper one concave, one or more of them often glandular at base. Stamens 10; filaments mostly hairy or glandular, and thickened or dilated towards the base, nearly equal; anthers oval, nearly uniform. Style as long as the stamens, somewhat thickened towards the apex. Legume oblong or linear, often falcate, compressed, dry, 2-valved, 2-10-seeded.—Low, perennial herbs, or suffruticose plants, often dotted with black glands. Leaves abruptly or unequally bipinnate. Racemes opposite the leaves; flowers yellow. Glands either sessile or pedicellate. T. & G. *Fl. N. Am.*

and calyx tomentose-pubescent; calyx-segments ovate, spreading; carpels hirsute.—Abundant in mountain ravines at middle elevations. *Hall & Harbour*, 149; *Parry*; *Canby*; *B. H. Smith*; *Meehan*. Ute Pass, *Coulter*.

RUBUS NUTKANUS, Moq.—Rare, *Parry*. Near Long's Peak, *Coulter*.

RUBUS DELICIOSUS, Torr. *Ann. N. Y. Lyc.*, 2, p. 196. Shrub, 3°-4° high, branched; branches, young leaves and calyx tomentose-pubescent or puberulent, not glandular; leaves reniform-orbicular, rugose, 1½'-2' in diameter, more or less 3-5 lobed, finely serrate-toothed; stipules lanceolate, scarious, persistent; peduncle 1-½' flowered; flowers 2' in diameter; sepals oval-oblong, with a dilated acumination, shorter than the oblong, white petals; fruit large, smooth, purplish, flavor not agreeable to the human palate, but prized by bears.—*Hall & Harbour*, 163; *Parry*, 210. Chiann Cañon and Glen Eyrie, *Porter*. Clear Creek Cañon, *Coulter*.

RUBUS TRIFLORUS, Richards.—*Hall & Harbour*, 164. Bear Creek, *Coulter*.

RUBUS STRIGOSUS, Michx.—Near Denver, *Dr. Smith*. Chiann Cañon, *Porter*. *Clear Creek Valley etc.*

PURSHIA¹ **TRIDENTATA**, DC.—Shrub, 2°-4° high; stipules minute; leaves 3"-12" long; calyx-lobes ovate, obtuse; petals obovate, exceeding the calyx, 3"-5" long; fruit 6" long, tardily deliscent, 2-valved.—Rare. *Parry*; *Meehan*. Mountain of the Holy Cross, *Coulter*.

CERCOCARPUS² **PARVIFOLIUS**, Nutt. Shrub 2°-10° high, branching from the ground; leaves 6'-8" long, cuneiform-obovate, silky-pubescent or nearly glabrous above, tomentose-canescens beneath, serrately-toothed towards the apex, strongly nerved; flowers solitary or 2-4 together on slender pedicels; calyx-tube becoming ½' in length; tail of the fruit 4" long, densely plumose.—*Hall & Harbour*, 165; *Dr. Smith*; *B. H. Smith*. At the base of the foot-hills and extending into the mountains, *Porter*.

AGRIMONIA EUPATORIA, L.—Colorado Springs, *Redfield*.

DRYAS OCTOPETALA, L. Low, suffrutescens; leaves oblong-ovate, coarsely crenate-toothed, obtuse at each end, clothed with a white tomentum beneath, the veins prominent, the margins revolute; stipules adnate to the petiole; peduncles terminal, 1-flowered; sepals linear; flowers white or yellowish. Alpine.—*Hall & Harbour*, 153; *Hoopes*.

¹ **PURSHIA**, DC. Calyx persistent, tubular-infundibuliform, imbricately 5-lobed. Petals white, unguiculate. Stamens 19-25, in one series, with free filiform filaments and large anthers. Carpels 1-3, free; style short, curved, persistent, stigmatose at the top and on one side; ovule solitary, erect. Fruit coriaceous, ovate-oblong, pubescent, sessile, exceeding the calyx. Seed with a membranous double testa, the two coatings separated from one another by a layer of deep purple, intensely bitter, granular matter; cotyledons flat, obovate; radicle short, inferior.—A diffusely-branched, leafy shrub, tomentose and somewhat glandular-pubescent upon the leaves, calyx, and fruit; leaves small, alternate and fascicled, sub-cuneiform, 3-cleft, the lobes short linear with revolute margins, canescens beneath; flowers yellow, subsessile, solitary, axillary and terminal. *Watson in Cl. King's Rep.*, Vol. V.

² **CERCOCARPUS**, H. B. K. Calyx-tube persistent, cylindrical, long and pedicelliform, terete; lobes of the hemispheric deciduous limb 5, small, valvate. Petals none. Stamens 15-25, in 2-3 series, seated on the limb of the calyx, with short free incurved filaments, and anthers often pubescent. Ovary solitary, with a single sub-erect ovule; style filiform, villous. Achenium linear-oblong, coriaceous, included in the calyx, caudate with the persistent long plumose style; seed linear, with a membranous testa, elongated cotyledons, and inferior radicle.—Shrubs or trees, with alternate simple leaves and axillary or terminal flowers. *Benth. & Hook.*

GEUM MACROPHYLLUM, Willd. *Gray's Manual*, p. 152.—Weston's Pass, *Coulter*. Twin Lakes, *Porter*.

GEUM STRICTUM, Ait.—Colorado Springs, *Redfield*.

GEUM RIVALE, L.—*Hall & Harbour*; *Parry*. Mountains west of Denver, *Greene*.

GEUM TRIFLORUM, Pursh.—*Hall & Harbour*, 152; *B. H. Smith*. Twin Lakes and South Park, *Porter*. Near Long's Peak, *Coulter*.

GEUM ROSSII, Seringe. Scape 1-flowered, 3'-8' high, slightly pubescent above, somewhat 2-3-leaved; radical leaves interruptedly-pinnate, rather glabrous, minutely ciliate; leaflets ovate or cuneiform, 2-3-lobed, incised or entire; flowers erect; calyx-lobes ovate, spreading, shorter than the roundish, yellow petals; carpels in a sessile head, minutely hirsute; styles persistent, glabrous, not exerted in fruit. Alpine.—*Hall & Harbour*, 156. *Gray's Manual*, *Dr. Smith*; *Canby*. James's Peak and the Sierra Madre Range, *Coulter*; *Redfield*.

CHAMERHODOS¹ ERECTA, Bunge. Pilose-pubescent, glandular; stem slender, 2'-1° high, paniculately branched above; radical leaves rosulate, ternately or biternately many-cleft, segments very narrow, obtuse, the upper cauline ones 3-5 cleft; petals white, longer than the calyx; ovaries 5-20.—*Hall & Harbour*, 462; *Canby*; *Porter*. South Park, *Coulter*.

FRAGARIA VESCA, L.—*Coulter*. Cañon City, *Brandegee*.

FRAGARIA VIRGINIANA, Ehrh., var. ILLINOIENSIS, Gr.—Denver, *Coulter*; *Dr. Smith*.

FALLUGIA² PARADOXA, Torr. *Emory Rep.*, t. 2. (*Sierersia paradoxa*, Don.) Shrub 1°-2° high, very much branched, with a white and shining bark; branchlets minutely pilose; leaves alternate, cuneate or obovate in outline, hirsute, 3-5 parted at the summit, 6" long, divisions linear, obtuse; flowers terminal on the more or less elongated branchlets, sub-corymbose; corolla about 9"-12" in diameter, white; achenia numerous, hairy, with long, finely plumose tails $\frac{1}{2}$ '-3' long.—Cañon City, *Brandegee*. Webster Cañon, *Redfield*. Pueblo County, *Greene*.

SIBBALDIA PROCUMBENS, L. (*Potentilla procumbens*, Clairv.) *Gray's Manual*, p. 153.—*Hall & Harbour*, 151. Sangre de Cristo Pass, *Brandegee*. Sierra Madre Range at 11,000 feet altitude, *Coulter*.

POTENTILLA ARGUTA, Pursh. *Watson's Revision*, *Proc. Am. Acad.* v. 8, p. 551. *Gray's Manual*, p. 154.—*Porter*; *Brandegee*. Plains of the Platte, *Coulter*. A lower and more slender form, 6'-12' high, smaller in

¹ CHAMERHODOS, Bunge. Calyx campanulate, deeply 5-cleft, ciliate; the base lined with a membranous disk, which is very densely bearded at the margin. Petals 5, obovate. Stamens 5, opposite the petals; and inserted with them into the sinuses of the calyx above the disk; filaments subulate, short, persistent. Achenia 5-10 or more; styles arising near the base of the ovaries, subulate. Receptacle conical, villous. Seed ascending, nearly orthotropous. Radicle superior.—Small, erect and branching glandular-pubescent herbs; perennial or biennial. Leaves many-cleft; the segments linear. Inflorescence dichotomously cymose. Petals white or purplish. *T. & G. Fl. N. Am.*

² FALLUGIA, Endl., *Gen. Pl.* Calyx with a very short-turbinate tube and spreading limb, 5-cleft, very minutely 5-bracteolate, valvate in activation, persistent. Petals 5, inserted on the calyx, alternate with its lobes and nearly as long, obovate. Stamens very many, inserted with the petals; filaments free; anthers 2-celled, longitudinally dehiscent. Ovaries very many, sessile in the bottom of the calyx, free, 1-celled, with a single ovule ascending. Styles terminal, continuous, filiform; stigmas papillose. Achenia numerous, included in the tube of the calyx, aristate with the very long exerted, bearded, plumose styles. Seed ascending; radicle inferior.

all its parts, with 11 leaflets and bright yellow flowers, from Ute Pass, Porter. Gray's Peak, Dr. Smith. Saint Vrain Cañon, Coulter.

POTENTILLA GLANDULOSA, Lindl. (*P. fissa*, Nutt.) *Watson's Rev., l. c.*, p. 552. More slender and branched than the former, 1^o-2^o high, less pubescent; leaflets 5-9, 1' long or less; cyme panicle with elongated branches and more slender pedicels; flowers often smaller; calyx less tomentose; bractlets linear; petals yellow, sometimes white; stamens 20-25.—Colorado, *vide* Watson, *l. c.*

POTENTILLA NORVEGICA, L. *Watson's Rev., l. c.*, p. 552. *Gray's Manual*, p. 154.—Denver, Dr. Smith; B. H. Smith. Cañon City, Brandegee. Monument Park, Coulter.

POTENTILLA RIVALIS, Nutt. *Watson's Rev., l. c.*, p. 552. More slender than the former, diffusely branched even from the base; pubescence softly villous; stipules lanceolate to ovate; leaves pinnate with 2 pairs of closely approximate leaflets, or a single pair and the terminal leaflet 3-parted; the upper leaves ternate; leaflets ovate or oblong-cuneate or lanceolate, 1'-1½' long, more or less incised-serrate; cymes loose, less leafy, with slender pedicels; bractlets and sepals equal, 1½''-3'' long; petals minute; stamens 10-20; achenia usually smooth; receptacle short.

Var. MILLEGRANA, Watson. (*P. millegrana*, Eng.) Leaves all ternate; stems erect or weak and ascending; achenia often small and light-colored.—Colorado, *vide* Watson in *King's Report*.

POTENTILLA PENNSYLVANICA, L., var. STRIGOSA, Pursh. *Watson's Rev., l. c.*, p. 554. Low, 6'-15' high; stems erect, leafy, rather stout; leaves mostly tomentose on both surfaces, paler beneath, deeply pectinate-divided or pinnatifid, segments linear, entire, with revolute margins; stipules lacinate.—Hall & Harbour, 162; Porter. Cañon City, Brandegee. Horse Shoe Mountain near Fairplay, Coulter.

POTENTILLA HIPPIANA, Lehm. (*P. pennsylvanica*, L., var. *Hippiana*, T. & G. Fl. N. Am.) *Watson's Rev., l. c.*, p. 555. Densely white-tomentose and silky throughout; the upper surface of the leaves a little darker; stems ascending, 1^o-1½^o high, slender, branching above into a diffuse cyme; stipules usually entire; leaves pinnate, occasionally digitate; leaflets 5-11, cuneate-oblong, 1'-2' long, obtuse, incisely-toothed, at least towards the apex, margins not revolute; pedicels slender; bractlets narrow; petals 2½''-3½'' long, exceeding the calyx; styles filiform, not glandular at base, terminal; carpels 10-30.—Hall & Harbour, 158. Near Denver, Dr. Smith; Canby. Colorado Springs, Porter. Cañon City, Brandegee. Ute Pass and Twin Lakes, Coulter.

POTENTILLA EFFUSA, Dougl. *Watson's Rev., l. c.*, p. 553. Canescently tomentose with scattered villous hairs; stems ascending, diffusely branched above, 4'-12' high; stipules lanceolate, entire or incised; leaflets 5-11, interruptedly pinnate, the alternate ones often smaller, cuneate-oblong, coarsely incised-serrate or dentate, the smaller leaflets 3-5 toothed; pedicels slender; sepals and the much smaller bractlets acuminate, 2''-3'' long, equaling or exceeding the obcordate petals; carpels 10.—South Park, Porter.

POTENTILLA PLATTENSIS, Nutt. *Watson's Rev., l. c.*, p. 556. Clothed with a minute appressed pubescence; stems 6' high, weak, decumbent; radical leaves pinnately 7-13 foliolate, cauline 3-5 foliolate; leaflets cuneiform, deeply pinnatifid-incised; the segments 3-7, oblong or linear; stipules large, broadly ovate or lanceolate, entire, panicle few-flowered; pedicels slender, elongated; petals obcordate, 2''-3'' long, a little longer than the acuminate calyx-segments.—Common in wet

grounds. *Hall & Harbour* 161. South Park, *Porter*. Wet Mountain Valley; *Brandegee*.

POTENTILLA DISSECTA, Pursh. (*P. diversifolia*, Lehm.) *Watson's Rev.*, l. c., p. 556. Low, alpine, more or less silky-villous with somewhat spreading hairs, or nearly glabrous; stems decumbent or ascending, 3'-12' long; stipules ovate or oblong-lanceolate, entire; leaflets 5-7, or rarely but 3, often glaucous, closely pinnate, or as frequently digitate, the upper one 1' long or less, cuneate-oblong, incisedly pinnatifid or serrate, the lowest often but trifid, the segments acute or acutish, and more or less tufted with white hairs; flowers few, on slender pedicels, in an open cyme; calyx more or less villous with spreading hairs, the bractlets short, the lanceolate sepals shorter than the petals, which are 2'-4' long, obovate and retuse or obcordate; receptacle very villous; carpels 10-20, or more.—Mountains near Denver, and Clear Creek Cañon, *Coulter*. Sangre de Cristo Pass, *Brandegee*. Gray's Peak, *Dr. Smith*.

VAR. GLAUCOPHYLLA, Lehm. Glaucous-green; leaves digitate, nearly glabrous on both sides; leaflets silky on the margin, with unequal segments.—*Parry*, 219; *Vasey*.

POTENTILLA GRACILIS, Dougl. *Watson's Rev.*, l. c., p. 557. Villous and more or less tomentose; stems 2°-3° high; stipules ovate or lanceolate, entire or subincised; leaflets mostly 7, sometimes 5, very rarely but 3, cuneate-oblong, obtuse, incisedly serrate or pinnatifid, tomentose beneath, green above and subvillous or appressed-silky, 1'-2½' long; flowers in a loose subfastigate cyme, the pedicels at length elongated and slender; calyx with the narrow bractlets shorter than the broad acute or lanceolate sepals; petals broadly obcordate, 3'-4' long, a little exceeding the calyx; carpels very numerous, (40 or more.)—Gray's Peak, *Dr. Smith*.

VAR. RIGIDA, Watson. (*P. rigida*, Nutt., not Wall. *P. Nuttallii*, Lehm.) A mostly stout and tall form, villous but without tomentum; the cyme loose or crowded; the leaves often large, 3'-4' long or more, and prominently veined beneath.—*Hall & Harbour*, 162 in part and 158 in part.

POTENTILLA HUMIFUSA, Nutt. (*P. concinna*, Rich.) *Watson's Rev.*, l. c., p. 558. Densely white-tomentose and silky-villous; stems decumbent, 2'-4' long, slender; leaflets 5, cuneate-oblong, 6'-9' long, green and appressed-silky above, only the rounded or truncate apex serrate with 3-5 teeth; flowers 3-5, on slender pedicels; bractlets narrow, shorter than the acute sepals; petals 2'-3' long, obcordate, exceeding the calyx; carpels 15-20. Subalpine.—*Hall & Harbour*, 157. Marsh near Long's Peak, *Coulter*.

POTENTILLA NIVEA, L. *Watson's Rev.*, l. c., p. 558. Pubescence silky-villous, often abundant, densely white-tomentose on the under side of the leaves and sometimes upon the calyx; stems 2'-12' high; leaflets cuneate-obovate or oblong, 3'-8' long, coarsely incised-serrate or pinnatifid, the terminal one sessile or petiolulate; flowers few or solitary, on slender pedicels; bractlets acute or acutish, shorter than the sepals; petals 2'-4' long; carpels few or many.—*Parry*, 214 and 215; *Vasey*.

POTENTILLA GRAYI, Watson, in *Rev.* l. c., p. 560. Pubescence scanty, villous; stems slender, 3'-6' high, 3-6 flowered; stipules ovate or oblong, entire; leaflets very broad and suborbicular, ½' long, the truncate or rounded apex 5-7-toothed, the middle leaflet long-petiolulate; sepals acute, the bractlets but half as long and obtusish; petals 2'-3' long, orbicular, retuse, exceeding the calyx; carpels 15-20.—Gray's Peak, *Dr. Gray*.

POTENTILLA FRUTICOSA, L.—Very common along the foot-hills and among the mountains. *Hall & Harbour*, 155. Near Denver, *B. H. Smith*; *Meehan*. South Park and Sierra Madre Range, *Coulter*.

POTENTILLA ANSERINA, L.—Common everywhere on the plains and in the mountains. Denver, *Dr. Smith*. Colorado Springs, *Porter*. Cañon City, *Brandegees*. South Park, *Coulter*.

ROSA BLANDA, Ait.—Common everywhere along streams in the foot-hills. *Dr. Smith*; *Meehan*. *Porter*; *Brandegees*; *Coulter*.

ROSA ARKANSANA, *Porter* (*n. sp.*) Stem stout, erect, leafy, 1° high, glabrous and glaucous, armed with weak, deciduous, bristly prickles; leaflets 9-11, ovate and oblong-ovate, 1' or more in length, acute or obtuse, glabrous, sharply serrate; midrib and long stipules somewhat prickly and minutely glandular; flowers numerous, terminal, corymbed, on peduncles about 1' long; fruit globose, smooth, glaucous; calyx-segments ovate, reflexed in fruit, with terminal and sometimes lateral appendages, more or less glandular and tomentose pubescent on the margins; petals broadly obovate or emarginate, longer than the calyx-segments, rose-color; flowers 2' in diameter.—This rose may possibly be an extreme form of *R. blanda*, but it differs in so many points that I have ventured to describe it as new.—Banks of the Arkansas near Cañon City, *Brandegees*. Raton Mountains, *Dr. Bell*. Texas, *Wright*.

ROSA PRAXINIFOLIA, *Bork*. Resembles *R. blanda*. Flowers large, 3' in diameter; fruit larger, 6' to 8' in diameter; 2° to 3° high, growing solitary on dry ridges.—In the mountains, *Hon. John Scott*.

PYRUS SAMBUCIFOLIA, *Cham. & Schlecht.*—*Meehan*.

AMELANCHIER CANADENSIS, T. & G., var. **ALNIFOLIA**, T. & G. Mountain of the Holy Cross, *Coulter*.

SAXIFRAGACEÆ.

SAXIFRAGA CÆSPITOSA, L. Perennial, dwarf, cæspitose; stems, 1'-2' high; leaves glandular-pubescent, 3-5-cleft, upper linear and entire, segments broadly-linear and obtuse; flowering stems with a few scattered leaves, glandular, 1-4 flowered; petals white, obovate, 3-nerved, scarcely longer or twice the length of the calyx. Alpine.—*Hall & Harbour*; *Parry*.

SAXIFRAGA RIVULARIS, L. "Rocky Mountains of Colorado," *Watson* in *King's Rep.*, vol. 5, p. 93.

SAXIFRAGA ADSCENDENS, L. (*S. controversa*, *Sternb.*) Annual, glandular-pubescent; stems 1'-3-high; erect, leafy; leaves cuneate-ovate, 3-5 toothed at the apex, the earlier spatulate and entire, radical ones crowded; branchlets 3-flowered; flowers pinkish or yellowish-white; calyx-lobes ovate, obtuse, shorter than the petals; pedicels bibracteate, about equaling the fruit.—"Alpine region," *Hall & Harbour*, 196.

SAXIFRAGA CERNUA, L. Annual, glabrate or glandular-pubescent; stems gradulate at base, leafy, weak, simple or branching, 2'-5' high, lower leaves reniform, broadly toothed or lobed, the upper ones bearing little bulbs in their axils; flowers often solitary, terminal, pendulous; sepals oblong or ovate, nearly distinct; petals obovate-oblong or obovate and retuse, white or cream-color, longer than the calyx; styles imperfect or deformed. Alpine.—Mount Lincoln at 12,500 feet altitude, *Coulter*. *Meehan*. Sangre de Cristo Pass, *Brandegees*.

SAXIFRAGA DEBILIS, Eng. Glabrous or very sparingly glandular pubescent; stems weak, ascending, 2-4-flowered, 2'-4' high; radical

leaves small, crenately lobed, cauline ones 3-lobed or entire; lobes of the calyx ovate, obtusish, at length shorter than the tube; petals ovate, obtuse, twice longer than the calyx, white or pinkish; tube of the calyx obconical, wholly adherent to the ovary; styles very short; stigma capitate. Alpine.—*Hall & Harbour*, 198. Sangre de Cristo Pass, *Brandegee*.

SAXIFRAGA HIRCULUS, L. Stem 1-6-flowered, leafy; leaves lanceolate, nerved, not ciliate; pedicels and upper part of the stem more or less hairy, not glandular; sepals usually ciliate, obtuse, much shorter than the obovate, many-nerved petals reflexed; flowers very large, yellow; style very short; stigma spatulate, at first inflexed, at length divaricate.—“South Park, in wet or swampy places.” *Hall & Harbour*, 201; *Canby*.

SAXIFRAGA SERPYLLIFOLIA, Pursh. Dwarf, caespitose, shoots creeping; leaves rosulate, imbricated, somewhat reflexed, oblong-obovate, thick, 3"-4" long, very smooth; stem filiform, few-leaved, slightly glandular-pubescent, 1'-2' high, 1-3-flowered; calyx not adherent to the ovary, the segments reflexed, obtuse, much shorter than the broadly-obovate, yellow, 3-nerved petals. Alpine.—*Hall & Harbour*, 199. Gray's Peak, *Dr. Smith*. Sangre de Cristo Pass, *Brandegee*. Gray's Peak at 12-1,300 feet, *Redfield*.

SAXIFRAGA FLAGELLARIS, Willd. Glandular-pubescent; stems simple, ½'-6' high, leafy, 1-3-flowered; stolons from the axils of the radical leaves long and filiform, naked and rooting at the ends; leaves obovate-spatulate, ciliate, lower much crowded, the upper oblong or linear; flowers large, yellow, 3"-4" long; sepals very glandular, united at the base and slightly coherent with the ovary; petals persistent, 3"-4" long, longer than the capsule. Alpine.—*Hall & Harbour*, 200; *Parry*. Mount Lincoln at 13,000 feet altitude, *Coulter*.

SAXIFRAGA BRONCHIALIS, L. Perennial; stems ascending, slender, producing short branchlets; leaves linear, 4"-5" long, rather coriaceous, finely ciliate, mucronate-pointed, crowded below; flowers corymbose on a long, slender, bracted peduncle, 3'-8' high; sepals lanceolate or ovate, obtuse or acutish; petals obovate-oblong, white, marked with numerous purplish spots, much exceeding the sepals; styles and stigmas convergent during flowering.—Rocky places. *Hall & Harbour*, 197; *Parry*; *B. H. Smith*; *Canby*; *Porter*. Mount Lincoln at 10,000 feet altitude and Twin Lakes, *Coulter*. *Clear Creek Valley*

SAXIFRAGA PUNCTATA, L. (*S. æstivalis*, Fisch.) Perennial, villous-pubescent or nearly glabrous; leaves radical, 1'-2' in diameter, long-petioled, roundish, reniform or orbicular, equally and deeply dentate, the teeth mostly acute; scape slender, naked, 1°-1½° high, the peduncles and pedicels of the usually open panicle glandular; bracts small, linear; petals white, oval, or orbicular, obtuse, exceeding the obtuse, ovate-oblong, reflexed sepals; filaments often petaloid and abortive; ovaries distinct below the middle.—*Hall & Harbour*, 207. Pike's Peak, *Canby*. Gray's Peak, *Dr. Smith*. Mount Lincoln, at 12-14,000 feet altitude, and Mount La Plata, at 11,000 feet altitude, *Coulter*.

SAXIFRAGA STELLARIS, L., var. *COMOSA*, Willd.—Mount Evans, at 13,000 feet altitude, *Greene*.

SAXIFRAGA NIVALIS, L. Perennial; leaves all radical, ovate or obovate, attenuate into a broad petiole, unequally crenate-dentate; scape naked, 3'-12' high, capitate or sub-corymbosely several to many-flowered; the half-adherent calyx erect, shorter than the oblong, obtuse,

subunguiculate petals; capsules purple, divergent.—*Hall & Harbour*, 193. South Park, *Porter*. Near Long's Peak and Westou's Pass, *Coulter*.

SAXIFRAGA INTEGRIFOLIA, Hook. Very viscidly-pubescent; leaves all radical, ovate or oblong-obovate, very obtuse, entire or slightly sinuate-crenate; scape elongated, 1°-3° high, paniculate at the apex, rather narrow or sometimes expanded, bracteate; petals obovate, twice the length of the glabrous, spreading, or at length reflexed, round-ovate, obtuse segments of the calyx; stamens short, styles free.—Sierra Madre Range, at 11,000 feet altitude, *Coulter*.

SAXIFRAGA JAMESII, Torr. Glandular-puberulent; stems 2'-6' high from a thick caudex, more or less leafy, 5-10-flowered; radical leaves on rather long petioles, reniform-cordate, smoothish, crenately-toothed or lobed; cauline ones few, the uppermost bract-like, cuneiform; raceme compound; flowers large; calyx-tube campanulate, cohering with the base of the ovary, the segments triangular-ovate, rather acute, about as long as the slender claw or the orbicular, purple petals; stamens 10.—*Hall & Harbour*, 203. In clefts of the rocks in Chiann Cañon, *Porter*. Pike's Peak, *Canby*.

TELLIMA¹ PARVIFLORA, Hook. (*Lithophragma*, Nutt.) Root more or less granulate; stems 6'-15' high, scabrous hirsute, with 1-2 ternately-divided or lobed leaves; segments 3-cleft, 4-8 flowered, occasionally bulb-bearing; leaves $\frac{1}{2}$ '-2' in diameter; pedicels sub erect, usually shorter than the calyx, which is obovate, elongating in fruit and densely glandular-hirsute; petals white, much exerted, deeply 5-cleft, projecting 1"-3" beyond the calyx; ovary adnate above the middle; seeds oblong, minutely roughened.—*Hall & Harbour*, 206.

MITELLA PENTANDRA, Hook. Leaves all radical, cordate, slightly lobed, crenately-serrate; scape slender, 1°-1½° high, naked; calyx campanulate with spreading lobes, adherent to the middle of the ovary; petals white, linear or filiform, deeply 3-cleft, longer than the calyx; stamens 5, with very short filaments, alternate with the petals; stigma entire; capsule opening prematurely.—*Hall & Harbour*, 208; *Parry*. Sierra Madre Range, at 11,500 feet altitude, *Coulter*.

CHRYSOSPLENIUM ALTERNIFOLIUM, L. Flowering stems erect; leaves alternate, reniform-cordate, doubly crenate or somewhat lobed; flowers corymbose.—*Hall & Harbour*, 576.

HEUCHERA BRACTEATA, Seringe. Small and nearly glabrous or minutely puberulent; scapes numerous from a thick, ligneous caudex, leafless or bracted; radical leaves roundish-subcordate, about 1' in diameter, incisely lobed, lobes short, crenately toothed, subciliate, teeth setaceous mucronate; flowers crowded in a spicate, somewhat compound raceme 1' to 1½' long; calyx campanulate, oblong, almost 5-cleft to the middle, lobes spatulate-oblong; petals attenuate, acute, scarcely broader than the filaments; styles and stamens at length exerted; thyrsus commonly more or less secund; flowers barely 2" in length.—In clefts of the rocks. *Hall & Harbour*, 205. *Parry*, 172; *Dr. Smith*; *B. H. Smith*. On the road from Denver to Idaho Springs, *Porter*.

HEUCHERA PARVIFOLIA, Nutt. Scabrous-puberulent; scape naked,

¹ **TELLIMA**, Brown. Calyx campanulate, dilated, prolonged beyond the ovary and adherent to it at base, 5-toothed or cleft, valvate. Petal 5, entire or divided, inserted on the throat of the calyx with the 10 small, included stamens. Ovary half-superior, conical, 1-celled, with 2-3 parietal, many-ovuled placentae; styles 2-3, short. Capsule wholly or half inferior, membranous, 2-3-valved, many-seeded.—Erect, simple, pilose or glandular herbs with petioled, rounded-cordate, lobed leaves and terminal racemes.—*Benth. and Hook.*

6-20 high; leaves roundish-cordate, crenately 5-7 lobed, at length glabrous, ciliate, the lobes short and rounded with 1 or 2 crenatures, minutely mucronate; panicle racemose, rather loose; bracts small, laciniate, ciliate; flowers small; calyx adherent to the ovary, obovate at base, limb flat, dilated; petals minute, caducous; stamens shorter than the lobes of the calyx; styles very short, conical; seeds muricate or hispid under a lens.—Common in the mountains. *Hall & Harbour*, 204; *Parry*, 174; *B. H. Smith*. Chianu Cañon, *Porter*. *Brandegee*. South Park, *Coulter*.

HÉUCHERA HALLII, Gr. Minutely glandular-puberulent; scape 4'-8' high, naked or with 1-3 minute, subulate bracts; thyrsus raceme-like, rather loosely 12-30 flowered; bracts scarcely longer than the pedicels; flowers white or pinkish, 3' long; calyx broadly campanulate, 5-lobed, lobes broad-ovate; petals narrowly spatulate, obtuse, exsert; stamens and styles included. Leaves as in *H. bracteata*, considerably variable.—*Hall & Harbour*, rocks, on mountains of medium elevation. On the Upper Arkansas, *Porter*. Grand Cañon of the Arkansas, *Brandegee*.

PAENASSIA PARVIFLORA, DC.—*Hall & Harbour*, 578. Wet Mountain Valley, *Brandegee*.

PARNASSIA FIMBRIATA, Banks. Scape 6'-18' high; flowers 1' in diameter; radical leaves on very long petioles, biancriculate-reniform; outline one very small, cordate, sessile, above the middle of the slender scape; petals fimbriate at the base, somewhat unguiculate, longer than the calyx; sterile filaments 5-9 in each set, or reduced to a crenately-toothed, broadly-cuneate, fleshy, carinate scale.—*Hall & Harbour*, 575. In damp places in the Sierra Madre Range at 10-12,000 feet altitude, *Coulter*.

*JAMESIA*¹ *AMERICANA*, T. & G. Cymes often longer than the leaves, 5-10-flowered; petals white, 3'-5' long, glabrous or slightly hairy within; calyx-lobes shorter than the petals, enlarged and foliaceous in fruit.—*Hall & Harbour*, 568; *Parry*. Georgetown, *Dr. Smith*; *Canby*. Chianu Cañon and Glen Eyrice, *Porter*. James's Peak and Clear Creek Cañon, *Coulter*; *Redfield*.

PHILADELPHUS MICROPHYLLUS, Gr. *Pl. Fendl.*, p. 54. Branches slender, erect; leaves small, 6'-9' long, ovate-lanceolate or oblong, very entire, obsoletely 3-nerved, shining above, pale, and minutely pilose beneath, narrowed at base into a very short petiole; flowers terminal, 1-3; calyx 4-cleft, glabrous without, lobes ovate-lanceolate, tomentulose within; styles connate to the apex, shorter than the stamens; stigmas 4, oblong; capsules subglobose.—Cañon City, *Brandegee*. The specimens received from Mr. *Brandegee* exhibit some of the characters of *P. serpyllifolius*, Gr. (*Pl. Wright*, 1, p. 77.) The leaves are pubescent above, some of them plainly 3-nerved and the lobes of the calyx silky-pubescent without. But it is clearly distinguished by the size of the leaves and the oblong stigmas. The hairs on the under side of the leaves are appressed and covered with tubercles under the microscope,

¹ *JAMESIA*, T. & G. Calyx-tube very short, turbinate, adnate to the base of the ovary; lobes triangular-ovate, sometimes blunt. Petals 5, obovate, convolute. Stamens 10, the alternate ones shorter; filaments linear, flattened, acuminate. Ovary conical, 1-celled, with 3-5 parietal, many-ovuled placentae; styles 3-5, equaling the stamens. Capsule included, incompletely 3-5-celled, dehiscent between the persistent, diverging styles. Seeds horizontal, ovate, shining, striate-reticulate, the embryo in the axis of the fleshy albumen.—A low, diffusely-branching shrub, 2-3' high; leaves opposite, petioled, ovate, mucronately serrate, canescent beneath, as well as on the petioles, calyx, and branchlets, with a soft, hairy pubescence; flowers cymose, in terminal panicles. *Benth. and Hook.*

as Dr. Gray has observed in those of *P. serpyllifolius*.—Webster Cañon, Redfield.

RIBES HIRTELLUM, Mx.—*Hall & Harbour*, 187. Cañon City, *Brandegee*. Clear Creek Cañon, *Coulter*. Ute Pass, *Porter*.

RIBES IRRIGUUM, Dougl. Stems 6° high, branches red, naked or prickly; subaxillary spines 3 or sometimes more, stout, rarely reflexed; leaves roundish, 5-lobed, 1'-1½' in diameter, cuneate, truncate or subcordate at base, crenately-serrate, nearly glabrous, somewhat hairy between the veins beneath and somewhat ciliate; peduncles slender and usually elongated, 3-flowered, glabrous or minutely glandular-pubescent; the bracts somewhat glandular-ciliate; calyx cylindrical and narrow (with the ovary often ½' long), glabrous, the segments linear-oblong, exceeding the tube, sometimes reflexed; petals short, oblong-spatulate, purplish-white; the stamens usually exceeding the calyx, but shorter than the deeply cleft style; filaments and style hairy; fruit rather large, smooth, deep-purple, edible.—Wilson's Creek, *Brandegee*. *Chambers*

RIBES LEPTANTHUM, Gr. *Pl. Fendl.*, p. 53. Shrub 2°-4° high, diffusely branched, without prickles; subaxillary spines solitary, stout, rarely two or three; the dense, minute pubescence glandular or often mixed with resinous dots, or the whole plant glabrous; leaves small, 4"-6" broad, numerous, 5-cleft, lobes incised; peduncles short, deflexed; flowers 1-2, nearly sessile, yellow, 2"-4" long; bracts rounded, shorter than the ovary; calyx tubular or somewhat campanulate, more or less silky-pubescent, the lobes subspatulate, more or less reflexed, equalling the tube and about twice longer than the stamens and petals; style glabrous, undivided; stigmas 2; fruit unarmed, glabrous.—Cañon City, *Brandegee*. Webster Cañon, *Redfield*.

RIBES LACUSTRE, Poir.—*Hall & Harbour*, 184. Weston's Pass, *Coulter*.

RIBES PROSTRATUM, L'Her.—*Hall & Harbour*.

RIBES CEREUM, Dougl. Diffusely branching shrub, 1° 6° high, unarmed; leaves roundish, ½'-1' broad, mostly cordate, 3-5-lobed, incisely crenate, viscid-puberulent or nearly glabrous, resinous-dotted; racemes nodding on short peduncles, crowded, 3-5-flowered; bracts ovate, appressed to the nearly sessile ovary; calyx tubular, 3'-4" long, glandular, segments very short, recurved, pinkish-white; petals minute, orbicular; stamens included; style undivided; stigmas 2; fruit globose, glandular, light red.—*Hall & Harbour*, 186. Glen Eyrie, *Porter*. Cañon City, *Brandegee*. Clear Creek Cañon, and common through the mountains, *Coulter*.

RIBES FLORIDUM, L'Her.—On the Platte near Denver, *Dr. Smith*.

RIBES AUREUM, Pursh. Shrub, neither prickly nor spiny, with long slender drooping branches, glabrous; leaves convolute in veneration, rather thick, 3-lobed, lobes divaricate, incisely few toothed, ciliate when young; petioles and peduncles minutely puberulent; raceme many-flowered, with foliaceous bracts exceeding the pedicels; calyx tubular, very slender, segments spreading, shorter than the tube, twice the length of the petals, yellow; style undivided; fruit yellowish or black, glabrous, edible.—*Hall & Harbour*, 188. Plains near Denver, *May, Coulter*. Cultivated for the fragrance of its flowers, under the name of "Missouri Currant."

CRASSULACEÆ.

SEDUM RHODIOLA, DC.—*Hall & Harbour*, 191; *Dr. Smith; Porter*. Mount Lincoln at 13,000 feet altitude, July, *Coulter*. Gray's Peak, *Redfield*.

SEDUM RHODANTHUM, Gr. *Sill. Jour.* (N. S.) 33, p. 405. Stems numerous, 6'-12' high from a thick root, erect simple, leaves flat, scattered, glabrous, oblong or oblanceolate, entire, 1'-2' long; corymb 1'-2' long, terminal, simple; flowers large, 4'-5', perfect, mostly tetramerous, more than twice the length of the pedicels; sepals linear; petals rose-color or nearly white, lanceolate, acuminate, twice exceeding the sepals and a little longer than the stamens which are adnate to them below the middle; ovary straight; styles filiform.—On the banks of rivalets, alpine and subalpine. *Hall & Harbour*, 189; *Parry*; *Dr. Smith*. Mount Lincoln at 13,000 feet altitude, *Coulter*.

SEDUM STENOPETALUM, Pursh. Glabrous; stems 3'-6' high, erect, several from a decumbent base, simple or somewhat branched; leaves crowded on the barren shoots, fleshy, compressed, subulate, sessile, acute, 2'-4' long; flowers bright-yellow, nearly sessile, pentamerous, 3'-4' long; petals linear, lanceolate, acuminate, twice longer than the subulate sepals.—Common everywhere at the base of the foothills and through the mountains to 12,000 feet altitude. *Hall & Harbour*, 190; *Canby*; *Dr. Smith*; *B. H. Smith*; *Meehan*; *Porter*; *Coulter*.

HALORAGACEÆ.

HIPPURIS VULGARIS, L.—Common in streams. *Hall & Harbour*, 182; *Parry*; *Brandege*. Clear Creek Cañon, *Coulter*. *Empire*

ONAGRACEÆ.

EPILOBIUM ALPINUM, L.—*Hall & Harbour*, 167. Chicago Lakes at 12,000 feet altitude, *Coulter*.

EPILOBIUM TETRAGONUM, L. Stems erect, 6'-20' high, usually branching, 4-sided, nearly glabrous; leaves opposite, oblong-lanceolate, denticulate, the middle ones more or less decurrent along the angles of the stem, the lower slightly petioled; flowers small; petals emarginate; stigma clavate; capsules pedicel, minutely pubescent.—*Dr. Smith*; *B. H. Smith*; *Porter*. Along the Platte and near Mount Lincoln at 10,000 feet altitude, *Coulter*. *Clear C.*

EPILOBIUM PALUSTRE, L.—*Hall & Harbour*, 166.

EPILOBIUM PANICULATUM, L. Stems 6'-30' high, glabrous or glandular-pubescent above, erect, slender, terete, dichotomous above; leaves narrowly linear, obscurely serrulate, acute, attenuate at base, mostly alternate and fascicled; flowers few, 1'-4' long, light rose-color, terminating the spreading filiform and almost leafless branches; calyx-tube infundibuliform, petals obovate, nearly twice exceeding the calyx lobes; capsule short, acute at each end, straight or a little curved, erect or spreading.—*Hall & Harbour*, 168. Mountains of Colorado, *Canby*. *Empire*

EPILOBIUM ANGUSTIFOLIUM, L.—*Hall & Harbour*, 170; *Dr. Smith*, *B. H. Smith*. Ute Pass and Twin Lakes, *Coulter*. *Clear Creek*

EPILOBIUM LATIFOLIUM, L. Stem ascending, often branched, 9'-18' high, glabrous or very minutely puberulent; leaves ovate or ovate-lanceolate, sessile, entire or nearly so, rather thick and rigid, 1'-1½' long, the veins not apparent; flowers axillary and terminal, on short pedicels; style somewhat erect, glabrous, shorter than the stamens.—*Hall & Harbour*, 169; *Parry*. Twin Lakes, *Coulter*. *Empire*

GAYOPHYTUM¹ RAMOSISSIMUM, T. & G. Stems 6'-18' high, becoming very much branched; flowers very minute; calyx-lobes lanceolate-oblong, equaling the rose-colored petals and exceeding the longer stamens; flowers $\frac{1}{2}$ ' long; capsules oblong, 3-5-seeded, 2'-3' long, rather shorter than the filiform, deflexed, pedicels.—*Hall & Harbour*, 172. Buffalo Peaks, *Coulter*.

GAYOPHYTUM RACEMOSUM, T. & G. Glabrous or nearly so; stems 6'-18' high, branched, branches elongated, mostly simple; leaves linear-spatulate, short, 6'-12' long; flowers axillary throughout the branches; segments of the calyx about the length of the petals; longer stamens one-third shorter than the petals; capsule linear, 8'-10' long, tapering at base into a very short pedicel or sessile, many-seeded.—*Hall & Harbour*, 171; *Parry*; *Brandegee*; *Canby*. Gray's Peak, *Redfield*.

ENOTHERA BIENNIS, L.—Along the Platte and in Ute Pass, *Coulter*; *Porter*.

ENOTHERA PINNATIFIDA, Nutt. Annual, decumbent, pubescent or puberulent; stem low, branches sometimes 1°-2° long; leaves deeply pinnatifid, with linear and acute segments, radical ones often nearly entire; flowers axillary, large, 2'-3' in diameter; segments of the calyx rather shorter than the tube and much shorter than the broadly obovate petals; style filiform, shorter than the petals, but exceeding the stamens; stigmas filiform, divaricate, as long as the slender anthers; capsules prismatic-cylindrical, striate-grooved, somewhat tapering towards the apex, about 1' long; seeds 1-rowed in each cell, terete, ascending.—*Hall & Harbour*, 177; *Brandegee*. Clear Creek, *Coulter*. On the Platte near Denver, *Dr. Smith*. Wet Mountain Valley, *Redfield*.

ENOTHERA CORONOPIFOLIA, T. & G. Perennial, with horizontal root-stocks; stems simple, often numerous from a branching base, erect or ascending, slender, canescently puberulent, strigose or hispid; basal leaves linear-spatulate, the rest pectinately-pinnatifid; throat of the calyx-tube densely villous; petals somewhat orbicular, entire, equaling the stamens, shorter than the pistil, nearly white, turning red, $\frac{1}{2}$ ' long; capsule ovate or linear-oblong, torulose at base, sometimes attenuated into a very short peduncle, sub-erect; seeds large, ovate, turgid, somewhat obtuse or obliquely truncate.—*Hall & Harbour*, 178; *Dr. Smith*; *B. H. Smith*; *Canby*; *Brandegee*. Plains around Denver and Colorado Springs, *Porter*. Plains of the Platte and Pleasant Park, *Coulter*. *Payson*.

ENOTHERA ALBICAULIS, Nutt. Perennial, puberulent or hirsute; stems usually 1°-3° high, erect or ascending, with a white, membranous, shining bark; leaves very variable, linear or lanceolate, attenuate at the base, entire or more or less dentate; petals round-ovate, more or less unguiculate, entire, exceeding the stamens and equaling the pistil, often nearly white; capsule thickened at base, sessile, linear, divaricate, often flexuous or deflexed; seeds rather small, linear-lanceolate, smooth.—*Dr. Smith*; *B. H. Smith*; *Canby*. Cañon City, *Brandegee*. Plains near Denver and Pleasant Park, *Coulter*. Colorado Springs, *Porter*.

ENOTHERA TRILOBA, Nutt. Biennial, acaulescent, nearly glabrous;

¹**GAYOPHYTUM**, A. Juss. Calyx-tube not produced beyond the ovary, linear, subterete; lobes 4, spreading, deciduous; petals 4, obovate, very shortly unguiculate; stamens 8, or 4, alternate, with as many staminodia; filaments short, filiform; anthers globose; style rather short, with a capitate or clavate stigma; capsule small, membranous, linear, 2-celled, 4-valved, two opposite valves bearing a narrow dissepiment; seeds few-many, in a single series in each cell, ascending.—Annual, slender, branching herbs, with alternate, linear, entire, nerveless leaves and small axillary, solitary flowers.—*Beath & Hook*.

leaves runcinate-pinnatifid, petioled, segments linear-lanceolate, often toothed; flowers large, sessile, 2'-3' in diameter, yellowish becoming rose-color; calyx-tube very long, filiform, dilated above; capsules oval or obovate, 1' in length, persistent and crowding at the base, cartilaginous or somewhat woody, reticulated, 4-winged, apiculate or 4-toothed at the apex; seeds horizontal, angled, densely tuberculate.—*Hall & Harbour*, 175. South Park, *Coulter*.

ENOTHERA CÆSPITOSA, Nutt. (Watson's *Rev.* in *Proc. Am. Ac.*, v. 8, pp. 585 and 605. Including *E. montana* and *E. marginata*, Nutt.; also *E. eximia*, Gr.) Acaulescent, or with a short, sub-erect stem, 2'-6' high, more or less villous-pubescent or nearly glabrous; leaves petioled, lanceolate, acute, variable in section, runcinate, lyrate, repandly-toothed or nearly entire; calyx-tube elongated, 3'-5' long; petals large, 1'-2' long, obcordate, nearly white, becoming rose-color; capsules sessile or upon short peduncles, coriaceous, oblong, somewhat attenuate above, straight or curved, sub 4-angled, more or less ribbed, with the ridges tuberculate or smooth, dehiscence loculicidal; seeds, two rows in each cell, nearly horizontal, obovate, smooth, sulcate.—*Hall & Harbour*, 173; *Parry*. North Park, *Hayden*. *B. H. Smith*. Near Denver, *Canby*. Plains of the Platte, *Coulter*. South Park, *Porter*.

A remarkably stout, canescent form of this very variable species, collected by Mr. Brandegee near Cañon City, corresponds very nearly to *E. eximia*, Gray, *Pl. Fendl.*, p. 45. The robust, ascending stems are more than a span high and the capsules sessile, conical, 1'-1½' long, tapering upward from a broad base, with 2 wing-crested ribs on each valve.

ENOTHERA MISSOURIENSIS, Sims. Stems low, simple, decumbent; leaves coriaceous, lanceolate, acute, tapering into a short petiole, obscurely denticulate, somewhat canescent when young; flowers axillary, very large, diurnal; tube of the calyx 4'-7' in length, segments acuminate, often spotted with purple, much shorter than the tube, about the length of the roundish, flabelliform, mucronulate petals; corolla 4'-6' in diameter; petals very broad, light-yellow, with orange veins; capsule pediceled, very large, somewhat compressed, with 4 broad wings, 2' in length and about the same in breadth including the wings, without the wings 3' in diameter; seeds large, the undulate crest conspicuous.—*Hall & Harbour*, 174.

ENOTHERA HARTWEGII, Benth., var. *LAVANDULÆFOLIA*, Gr. Suffruticose, low, hoary-canescens; stems simple, decumbent, 6' long; leaves crowded, linear, or oblong-linear, entire, obtuse or acutish, somewhat revolute; tube of the calyx 2' long, tubular-infundibuliform, many times longer than the ovary and the ovate-lanceolate, slightly acuminate segments; petals rhombic-ovate, crenulate, longer than the stamens; stigma discoid; capsule sessile, cylindrical, canescent; seeds in a double series, horizontal.—Cañon City, *Brandegee*. Bluffs at Pueblo, *Greene*.

ENOTHERA CANESCENS, Torr. & Frem. *Frem.* 2d. *Exp.*, p. 315. Gray in *Pl. Fendl.*, p. 44. (*E. guttulata*, Hook.) Stems ascending, 6'-8' high, branching, very leafy to the top; leaves minutely strigose-canescens, 6' long, oblong-lanceolate or linear, entire or obscurely toothed; calyx-tube slender, 9' long, purplish, thrice the length of the ovoid, canescent ovary; petals broadly obovate, entire, ¾' long, white, with some of each flower conspicuously spotted or blotched with rose-purple; anthers linear; divisions of the stigma linear, slender; capsule slender, canescent, 3' long and almost as broad, turgid-ovate, apiculate, with 4 strongly carinate and almost winged angles, the intermediate ribs

scarcely prominent; seeds numerous in each cell, obovate, with a smooth and thin testa.—Purgatory River, *Dr. Bell*.

ENOTHERA SERRULATA, Nutt.—*Hall & Harbour*, 179; *B. H. Smith*. Plains of the Platte and Monument Park, *Coulter*. On the plains between Denver and Colorado Springs, *Porter*. *Denver*

ENOTHERA BREVIFLORA, T. & G. (*E. Nuttallii*, T. & G.) Perennial, acaulescent; leaves petioled, 2'-6' long, lanceolate, acuminate, interruptedly pinnately-parted, the segments lanceolate, acuminate, toothed or entire; calyx-tube marcescent, much shorter than the leaves, filiform, dilated at the summit, segments lanceolate, shorter than the obovate, yellow petals, scarcely exceeding the style; stigma capitate, entire; capsules large, sessile, submembranous, oblong and attenuate above, sub-tetragonal and sulcate on the sides, very-many-seeded; seeds smooth, somewhat ascending, terete, oblong, slightly reniform, 2 series in each cell.—*Hall & Harbour*, 176.

*STENOSIPHON*¹ *VIRGATUS*, Spach. Spikes in fruit sometimes nearly 1° long; bracts subulate, longer than the ovary, rather persistent; calyx pubescent, tube exceedingly slender, 4"-3' long; petals rather large in proportion; ovary tomentose-pubescent.—*Parry*; *Canby*.

GAURA PARVIFLORA, Dougl. Stem tall, erect, more or less branched, 2°-5° high, clothed, besides the long, soft-villous hairs, with a minute, slightly glandular pubescence; leaves ovate-lanceolate, 1'-3' long, acute or acuminate, repand-denticulate, clothed on both sides with a soft, velvety pubescence; spikes virgate, dense, strict, in fruit often elongating 1° or more; bracts lanceolate-subulate; flowers very small, rose-colored; calyx-tube shorter than the glabrous ovary and longer than the segments; petals spatulate-oblong; anthers oval, retuse, attached by the middle; lobes of the stigma very short; fruit sessile, oblong-clavate, 4-nerved, obtusely angled above, 3'-4' long.—On the plains near Denver, *Dr. Smith*. *Hall & Harbour*, 180; *Parry*, 181; *Canby*. Cañon City, *Redfield*.

GAURA COCCINEA, Nutt. Canescent, puberulent or glabrate; stems suffruticose and fastigiately branched from the base, 6'-12' high, very leafy, ascending; leaves lanceolate, linear-oblong or linear, repand-denticulate or entire, 6"-12" long, closely sessile; flowers in simple spikes terminating the leafy branches, rose-color, turning to scarlet; bracts linear, rather persistent, longer than the ovaries; calyx-segments linear-oblong, shorter than the narrow infundibuliform tube, as long as the roundish, unguiculate petals; fruit elliptical, sessile, short, terete, 4-sided above.—*Hall & Harbour*, 181; *Dr. Smith*; *B. H. Smith*; *Canby*. Plains around Denver and Colorado Springs, *Porter*. Plains of the Platte, *Coulter*.

CIRCÆA ALPINA, L.—*Hall & Harbour*.

LYTHRACEÆ.

LYTHRUM ALATUM, Pursh.—Plains near Denver, *Dr. Smith*.

¹ *STENOSIPHON*, Spach. Tube of the calyx filiform or almost capillary, much prolonged beyond the ovary, recurved or declined after flowering, at length deciduous; the limb 4-parted, much shorter than the tube. Petals 4, unguiculate, unequal. Stamens 8, erect, the alternate ones a little shorter; filaments capillary; anthers oblong, fixed by the middle. Ovary oval, 1-celled, with 4 suspended ovules; style erect, filiform, dilated at the apex; stigma 4-lobed. Fruit (very small) coriaceous and indehiscent, ovate, convex externally, flattish within, about 8-ribbed, 1-seeded.—A tall, perennial herb, with virgate branches, and scattered linear-lanceolate, sessile, acute, nerveless, entire leaves, gradually reduced to bracts. Flowers (white) sessile, crowded, in long and strict, virgate spikes. *T. & G. Fl. N. Am.*

LOASACEÆ.

MENTZELIA NUDA, T. & G. Rough with a minute, barbed pubescence; stems 1°-3° high, white, often widely branching; leaves lanceolate or oblong-lanceolate, sessile, toothed or pinnatifid, with sharp or obtuse spreading teeth, very rough; flowers large, terminating the branches, vespertine, bracteolate, (not bracteolate, T. & G.); petals 10, lanceolate, tapering at the base, acute, yellowish-white with numerous darker veins, 1' to 1½' long; stamens very numerous, the exterior filaments petaloid and often sterile, the others filiform, capsule-cylindrical, 1' or more long, 4" wide, 3-valved at the summit; seeds numerous, ovoid, with a broad, membranous wing.—*Hall & Harbour*, 569; *Dr. Smith*; *B. H. Smith*. On the plains near Denver and Colorado Springs, *Porter*, Cañon City, *Brandegee*. Plains of the Platte, *Coulter*.

MENTZELIA ALBICAULIS, Dougl. Stem 6'-18' high, usually branching from the base, white and polished and nearly glabrous below, rather weak; leaves lanceolate, remote, more or less deeply pinnatifid, sometimes repand or nearly entire, scabrous, sessile; flowers solitary or somewhat clustered, not bracteolate; petals obovate, 2" long, light-yellow, scarcely exceeding the short, subulate-lanceolate calyx-segments; filaments 15-30, subulate-filiform or occasionally somewhat dilated; capsules cylindrical, narrow, elongated, attenuate at base, 6" to 9" long, 1" to 1½" wide, minutely hispid; seeds 20-40.—*Hall & Harbour*, 571. Near Denver, *Canby*. Cañon City, *Brandegee*. Plains of the Platte, *Coulter*. Frequent on the plains and among the foot-hills.

MENTZELIA MULTIFLORA, Nutt. *Pl. Gamb.* in *Jour. Proc. Acad. Phil.* Feb. 1848, under *Bartonia*. Stems scabrous, pubescent, ¾°-1° high, slender, corymbosely branched above, rough, pubescent or becoming smooth and white with age; leaves lanceolate or narrowly lanceolate, sinuate-pinnatifid, attenuate below and sessile; flowers subtended by 1 or 2 ovate or linear, entire bracts; petals 10, deep or golden-yellow, oblong-oval, obtuse or acute, 6"-9" long, abruptly pointed, much longer than the subulate calyx-segments; capsules cylindrical-oblong, about 6"-8" long, 3"-4" wide, a little longer than the calyx-segments; seeds in a double series, winged.—*Hall & Harbour*, 570; *Canby*. Wet Mountain Valley, *Brandegee*.

MENTZELIA OLIGOSPERMA, Nutt.—Wet Mountain Valley, *Brandegee*.

MENTZELIA WRIGHTII, Gr. *Pl. Fendl.*, p. 48. Annual, rough-scabrous; stems simple or paniculate, 2° high; leaves oblong-lanceolate, coarsely sinuate-dentate, lowest attenuate into a petiole, upper ones truncate at base or somewhat broadly auriculate, closely sessile; bracteoles 1-2, linear, entire, equaling the ovary; flowers small, ochroleucous; petals 10, lanceolate-spatulate, scarcely surpassing the lobes of the calyx, shorter than the cylindrical ovary; filaments all linear-subulate, outer ones a little dilated; placenta 3-many seeded; seeds winged.—Purgatory River, *Dr. Bell*.

CACTACEÆ.

MAMILLARIA NUTTALLII, Eng., var. *CÆSPITOSA*, Eng. *Syn. Proc. Am. Ac.*, v. 3, p. 9. Cæspitose; radial spines 12-15, setaceous, straight, puberulent, white, central one often wanting; fimbriate sepals and yellow pe-

¹*MAMILLARIA*, HAW. Sepals and petals united beyond the naked ovary into a short tube. Berry juicy, oval or club-shaped. Seeds brown or black; embryo straight, without albumen; cotyledons very short, globose.—*Low*, globose or oval plants, simple or branched, covered with spine-bearing tubercles; flowers rising from the axils of the tubercles, usually small, about as wide as long, opening in sunshine only.

Mentzelia ornata Nutt.

M. chrysantha n. sp. *Canby*

tals often sparingly denticulate at the apex, lanceolate or linear-lanceolate, acute; stigmas 5, spreading; berry subglobose, shorter than the tubercles, red; seeds globose, scrobiculate, black.—Golden City, *Greene*.

MAMILLARIA VIVIPARA, Haw. *Eng. Syn. l. c.*, p. 13. Simple, oval, the almost terete tubercles bearing fascicles of 5-8 reddish-brown spines, surrounded by 15-20 grayish ones in a single series; all straight and very rigid; the latter 5'-8" long; the former even 10" long; flowers purple, often 2' or more in diameter, with numerous lance-subulate petals and fringed sepals; berry oval, green; seed pitted, light-brown.—Foot-hills near Long's Peak, *Coulter*. *Redfield*. *Cañon Manito*

*ECHINOCACTUS*¹ *SIMPSONI*, Eng. Simple, globose or depressed, with ovate tubercles like a *Mamillaria*, bearing 20 outer ash-colored spines and 5-10 stouter, darker, inner ones, all straight and rigid; flowers from the top of the just developing tubercles, small, 9"-12" broad, yellowish-green to purplish; scales on the ovary very few; berry small, dry, with few black, tuberculated seeds.—Near Cañon City? *Brandegee*; *Greene*.

CEREUS VIRIDIFLORUS, Eng. *Syn. l. c.* p. 22. Ovate or at length cylindrical, simple or sparingly branched, 1'-2' high; ribs about 13; areolae ovate-lanceolate; spines strictly radiating, 12-18, with 2-6 superior, setaceous ones, the rest lateral, longer, the lower frequently purplish-brown, the others white; central one often wanting, when present, stouter, solitary, variegated; flowers lateral towards the apex, yellow, becoming green; berries elliptical, small; seeds tuberculated.—Cañon City, *Brandegee*; *Coulter*. *manito*

CEREUS FENDLERI, Eng. *Syn. l. c.* p. 25. Stems 3'-8' high, not many from the same base, ovate-cylindrical; ribs 9-12; areolae rather crowded; spines very variable, always bulbous at base, radial ones 7-10, straight or curved, 6'-12" long, white and brown, lower ones stronger, central one stout, curved above, dark-brown, often elongated, 1'-2' long; the flowers lateral below the top, large, 2'-3' in diameter, of a deep purple color, diurnal; berry 1'-1½' long, edible; seed oblique, deeply and irregularly pitted by the confluence of many of the tubercles.—Canon City, *Brandegee*; *Greene*.

CEREUS GONACANTHUS, Eng. & Big. *Pac. R. R.*, 4, p. 33. Ovate, simple or sparingly branched from the base, 7-ribbed; areolae large, orbicular, distant; spines robust, angled, straight or variously curved; radial ones 8, yellowish, often blackish at base and apex, 8'-15" long, the upper one much larger than the others, 1½'-2½' long, nearly equaling the central one, which is remarkably stout, angular, and channeled; flowers scarlet, open day and night.—Cañon City, *Brandegee*. Pueblo, *Greene*.

¹ *ECHINOCACTUS*, Link & Otto. Sepals and petals united beyond the sepal-bearing ovary into a short tube. Berry globose or oval, juicy or dry, covered with scales and sometimes with wool. Seeds brown or black; embryo usually curved over a small albumen; cotyledons short, foliaceous, parallel to the sides of the seed. Globose or oval, mostly simple, generally many ribbed with bunches of spines on the ribs, rarely tuberculated; flowers near the top, just above and close to the spines of the same season, usually large, as wide as long, open only in sunshine.

² *CEREUS*, Haw. Sepals and petals united above the sepal-bearing ovary into a short, or, usually, long tube. Berry juicy, globose or oval, beset with scales (sometimes rather indistinct) or spines. Seeds brown or black; embryo straight or usually curved, without albumen; cotyledons short or foliaceous, commonly contrary to the sides of the seed. Globose or oval, or mostly cylindrical or columnar, few or many ribbed, usually branched, bearing bunches of spines on the ribs; flowers lateral, just above and close to the spines of previous seasons, usually large, fully open in sunlight or at night, or rarely, permanently.

The above species belong to *Echinocereus*, Eng. Heads commonly many, low, oval or cylindrical; flowers short, mostly as wide as long; ovary covered with bunches of spines; stigmas green; seeds small, tuberculated; cotyledons short, straight.

CEREUS PHENICEUS, Eng. *Syn. l. c.*, p. 28. Heads 2'-3' high, 2' thick, generally forming dense hemispherical masses 1° or more in diameter, ovate or subglobose, 9-11 ribbed; areole ovate-orbicular, somewhat crowded; spines setaceous, straight, radial ones 3-12, upper ones a little shorter, central ones 1-3, bulbous at base, terete, a little stronger, 5'-10" long, lowest one longest; stamens shorter than the petals; stigmas 6-8.—Cañon City, *Brandegee*; *Greene*.

CEREUS CONOIDEUS, Eng. & Big. *P. R. R.*, vol. 4, p. 35. Heads 3'-4' high, few from one base, of unequal height, ovate, acutish towards the apex, conoid, 9-11 ribbed; radial spines 10-12, slender, rigid; upper ones 2'-3' long, lateral ones 6"-15"; upper central spines hardly longer than the lateral ones, lower one 1'-3' long, angular and often compressed.—Cañon City, *Brandegee*.

CEREUS PAUCISPINUS, Eng. *Syn. l. c.*, p. 29. Stem 5'-9' high, 2'-3' in diameter, ovate-cylindrical, sparingly branching or simple, 5-7 ribbed; areolæ remote; spines strong, 9"-16" long, dark-colored, radial 3-6, central wanting or rare, stout, subangled.—Cañon City, *Brandegee*.

OPUNTIA CAMANCHICA, Eng. & Big. *Syn. l. c.*, p. 37. Large, prostrate, extensively spreading, joints ascending, 6'-7' long, suborbiculate; pulvillæ remote, numerous, armed; setæ straw-colored or brownish, few; spines 1-3, compressed, brownish, paler at the apex, 1½'-3' long, upper ones elongated, suberect, the others deflexed; berry large, juicy, ovate, widely umbilicate; seeds 2"-3" in diameter, angled, deeply notched at the hilum.—Cañon City, *Brandegee*.

OPUNTIA RAFINESQUI, Eng. *Syn. l. c.*, p. 39. Very variable.—Cañon City, *Brandegee*.

OPUNTIA MISSOURIENSIS, DC. *Eng. Syn. l. c.*, p. 43. *Gray's Manual*, p. 185. Presenting a great variety of forms.—Cañon City, *Brandegee*. Foot-hills near Denver, *Coulter*. Colorado Springs, *Porter*. Frequent in broad patches on the plains and in the mountains.

OPUNTIA ARBORESCENS, Eng. *Syn. l. c.*, p. 51. Arborescent, 5°-6° high, (but further south 10°-20° or more;) branches numerous, verticillate, horizontal, or pendulous; joints verticillate, cylindrical; tubercles cristate, prominent; spines 8-30, divaricately stellate; berry sub-hemispherical, tuberculate-cristate, yellow, unarmed; seeds regular.—The woody portion of the stems, deprived of the parenchyma, is often manufactured into canes. Abundant along the Arkansas east of the mountains, *Porter*. Cañon City, *Brandegee*. *Plains to northern*

CUCURBITACEÆ.

CUCURBITA PERENNIS, Gr. *Pl. Lindh. Pt. 2*, p. 193. Root fleshy, very large, 6'-3° thick, fusiform, yellow inside; stems trailing on the ground; leaves strigose-canescens, cordate-ovate or triangular, narrowed above, undivided or subsinnate-repand, margin denticulate; lobes of the calyx subulate, equal to the tube; fruit globose, yellow, 2'-3' in diameter.—Plains and prairies east of the mountains, *Porter*. Near Cañon City, *Brandegee*; *Redfield*. *Plains*

ECHINOCYSTIS LOBATA, T. & G. *Gray's Manual*, p. 187.—Near Denver, *Dr. Smith*.

UMBELLIFERÆ.

CICUTA MACULATA, L.—Plains of the Platte, June, *Coulter*.

Sium LINEARE, Mx.—Weston's Pass and White House Mountain at 11,000 feet altitude, *Coulter*.

SIUM ANGUSTIFOLIUM, L.—Near Cañon City, *Brandegee*. Denver, *Porter*.

OSMORRHIZA NUDA, Torr. *P. R. R.*, 4, p. 93. Petioles and lower part of the stems strigosely pubescent; leaflets broadly ovate, often deeply 3-lobed, coarsely dentate-serrate; peduncles elongated; involucre and involucels none, or occasionally present though small; umbel 4-rayed, rays 4-6 flowered; styles very short, fruit obtuse, shorter than the pedicels. Too near *O. brevistyla* of the Eastern States.—*Hall & Harbour*. Sierra Mojado, *Brandegee*.

CYMOPTERUS ¹*GLOMERATUS*, DC. Root thick and fusiform; plant 3'-8' high; caudex about 1' high, sometimes divided, bearing the leaves and peduncles at the summit; leaves on long petioles, ternately-divided and bipinnatifid, segments oblong-linear; rays of the umbel 4-6, very short; peduncles much shorter than leaves, 6"-12" long; flowers white, those of the center abortive, pedicellate; leaflets of the palmately 5-7 parted involucre coherent at base and partly adnate to the rays of the umbellets; calyx-teeth subulate; fruit elliptical, 4" long, wings thickened and somewhat spongy, more or less obsolete; vittæ in each interval 3-4, in the commissure about 8.—*Hall & Harbour*, 210. Cañon City, *Brandegee*. Clear Creek Cañon, *Coulter*.

CYMOPTERUS MONTANUS, Nutt. Root long and fleshy; stem 2'-6' high; caudex 6"-18" long, erect, sheathed at base; leaves glaucous, ovate in outline, bipinnately divided, segments rather few and distant, about 3-4 pairs, oblong-linear, rather obtuse; peduncles shorter or longer than the leaves; involucre and involucel somewhat campanulate, scarious, about 5-parted, segments oblong, obtuse, entire or 5-cleft, with greenish ribs; flowers white, polygamous; calyx-teeth minute, ovate; fruit about 3" long, the integuments thick and opaque so as to conceal the vittæ, commissure with 4 vittæ; carpophore persistent, 2-parted; wings 6-10, broad and membranous, often unequal; seed more or less involute.—*Hall & Harbour*, 211. Cañon City, *Brandegee*. Plains near Denver, *Coulter*.

CYMOPTERUS ALPINUS, Gr. *Sill. Jour.*, (N. S.), 32, p. 408. Caudex caespitose; leaves pinnatisect, pinnae 3-5, approximate, 3-7 parted, segments linear-lanceolate, acutish or mucronate, very entire, or the lower 2-3 cleft; scape 2'-4' high, bearing a subcapitate umbel, a little longer than the leaves; involucels somewhat one-sided, 5-7 parted, segments linear or lanceolate, green, equaling the golden flowers; teeth of the calyx lanceolate, subulate, persistent; wings of the fruit equal, somewhat erose, scarcely undulate; vittæ 1-2 in the intervals, 4 in the commissure; carpophore none; fruit 2'-3' long. High alpine.—*Hall & Harbour*, 213; *Parry*, 158; *Cauby*. Summit of Pike's Peak, *Porter*. Mount Lincoln at 13,000 feet altitude, *Coulter*.

CYMOPTERUS? *ANISATUS*, Gr. *Proc. Ac. Phil.*, March, 1863, p. 33. Acaulescent, caespitose from the much-branched caudex, glabrous; leaves

¹*CYMOPTERUS*, Raf. Calyx-teeth rather prominent and setaceous or lanceolate, minute or obsolete. Petals ovate, oblong or oblanceolate, inflexed, quasi-emarginate. Disk flattened around the styles, undulate-margined. Fruit ovate or elliptical, obtuse or retuse, subterete or slightly compressed dorsally; carpels semi-terete; ribs thick and elevated, all or only the lateral ones or those opposite to the calyx-teeth expanded into wings; vittæ numerous, narrow. Carpophore 2-parted, free or attached to the carpels. Seeds much compressed dorsally and more or less concave on the face.—Perennial and subcaespitose, with a thickened caudex; leaves pinnately decomposed, with narrow, small or incisely pinnatifid segments; umbels compound, usually few-rayed; involucral bracts 1-2 or none; of the involucels several, very narrow or broad and membranous; flowers white or yellow. *Benth. & Hook.*

4'-6' long, erect, narrow, on long petioles, somewhat rigid, pinnate, the leaflets 6-10 pairs, pinnately parted, segments entire or laciniately lobed, linear, pungently acute; scapes equaling or exceeding the leaves, 6'-12' high; rays 6-12, unequal; involucre usually none; involucl of 6-8 linear, subulate leaflets, equaling the white flowers; calyx-teeth conspicuous, linear-subulate, foliaceous; fruit 2" long, irregularly winged, the lateral ribs and the dorsal one usually broader, rather thick, and not membranous; vittæ obscure, 1 in each narrow interval, 2-4 in the commissure; seeds slightly concave, somewhat crenately sulcate under the dorsal intervals.—In the mountains. *Hall & Harbour, 222; Canby.*

MUSENIUM¹ TRACHYSPERMUM, Nutt. Decumbent; leaves bipinnatifid, segments pinnatifid, rather obtuse, lobes often 2-3 cleft and very short, rachis wide; involucl about 8-leaved, short; fruit short, oval, pulverulently-scabrous. Near *M. divaricatum*, Nutt., but smaller. Fruit only half as large, nearly as broad as long.—*Hall & Harbour, 214.*

MUSENIUM GREENII, Gr. *Proc. Am. Acad., Feb., 1872, v. 8, p. 387.* Stemless; leaves all from a caudex squamose at the summit, almost simply pinnate, narrow; leaflets 7-9, on a rachis margined only above, sessile, subovate in outline, pinnately 5-7 lobed and few-toothed, teeth and lobes sharp; scapes more than a span high, wholly naked; umbels short-rayed; involucl of 3 or 4 subulate bracts, nearly equaling the subsessile, yellow flowers; fruit 2" long, oblong, very obtuse, truncate, smooth, crowned with the ovate, subulate calyx-teeth; ribs rather prominent, very narrow; vittæ between, 1-2, large; beneath, solitary, small.—Mountains above Golden City, *Greene.*

LIGUSTICUM APHIFOLIUM, Benth. & Hook., *Proc. Am. Acad., 7, p. 347.* (*Cynopium*, Nutt.) Stems 2°-4° high, terete, leafy or naked, branching towards the summit, with 2-4 umbels on long peduncles; leaves pinnately decomposed, the segments incisely lobed, acute; cauline leaves ternate, upon a short dilated sheath; involucre none; involucl few-leaved, lateral; calyx-teeth obsolete; the stylopodia rather prominent, with a somewhat dilated crenate margin; fruit 2½" long, oval, with acutely carinate ribs; seeds concave on the face, with a central longitudinal ridge.—Platte River and in the Sierra Madre Range, *Coulter.* Wet Mountain Valley, *Brandegee.* *Hall & Harbour, 218.*

LIGUSTICUM SCOPULORUM, Gr. *Proc. Am. Acad., 7, p. 347.* Rather stout, 2°-4° high; leaves pinnately decomposed, segments ovate, deeply incised, teeth very acute; fruit elliptical-oblong, 4" long; wings narrow, thickened, intermediate and dorsal 1-2, often obsolete; vittæ marked, rather large, in all the intervals 3, in the lateral ones sometimes 4; section of the seed almost reniform. Alpine and subalpine.—*Hall & Harbour, 216.* Cañon City, *Brandegee.* Near Denver, *Canby.*

LIGUSTICUM MONTANUM, Gr. (*Thaspium montanum*, Gr. *Pl. Fendl., p. 57.*) *Proc. Am. Acad., 7, p. 347.* Very smooth; stem erect, slender, from a thick fusiform root, 1°-2° high; leaves twice ternately divided; leaflets cuneiform, trifid, lobes oblong or lanceolate, sometimes linear, entire, or the

MUSENIUM, Nutt. Margin of the calyx 5-toothed; the teeth persistent. Petals obovate; the point inflexed. Styles slender, reflexed, rather long. Fruit ovate or ovate-oblong, laterally compressed. Carpels more or less minutely scabrous, with 5 filiform, acute, slightly prominent ribs. Intervals with 2-3 vittæ. Commissure with 4 vittæ. Carpophore 2-cleft. Seed with the sides moderately incurved.—Perennial, dwarf, rather fetid, resiniferous (North American) herbs, with fusiform roots and a short caudex, or branching dichotomously from the base. Leaves 2-3 pinnatifid. Involucre none. Involucl unilobed, of a few rather rigid narrow leaflets. Flowers yellow or white. *T. & G. Fl. N. Am.*

Conioselinum canadense Torr. Hall 218
C. Fischeri Wimm. Parry 156 Hall 216
Ligusticum subulatum

larger ones incised; petioles with a long dilated, spathaceous base; involucre none; involucrel of about 9 setaceous, unequal leaflets, equaling the pedicels; flowers bright-yellow; fruit $1\frac{1}{2}$ "-2" long, oblong-oval or nearly orbicular, marginal wings broad; the strong vitta single or double. Foliage variable.—*Hall & Harbour*, 217; *Porter*; *Hoopes*. Sierra Madre Range, at 11,500 feet altitude, and Twin Lakes, *Coulter*.

THASPIUM TRIFOLIATUM, Gr.—Near Cañon City and Wet Mountain Valley, *Brandegee*.

THASPIUM TRACHYPLEURUM, Gr.—*Proc. Acad. Phil. March*, 1863, p. 63. Glabrous; stem 1° or more high, striate, 1-3 leaved, bearing 2-3 umbels on long peduncles; leaves ternately decomposed, segments filiform, mucronulate; petioles dilated at base, not scarious-margined; involucre and involucrel of 1-3 small, subulate leaflets; flowers yellow; fruit twin-ovate, laterally compressed, transverse section of the mericarps almost orbicular; ridges or wings 5, similar, thick, suberose, very obtuse, scabrous, one strong vitta in each of the intervals.—*Hall & Harbour*, 215; *Meek*. South Park, *Porter*. Saint Vrain Cañon, Bear Creek and Boulder Cañon, *Coulter*. Grand Cañon of the Arkansas, *Brandegee*.

SESELI¹ HALLII, Gr. *Proc. Am. Ac., June*, 1870, v. 8, p. 288. Acaulescent from a stout caudex branching at the summit; leaves pinnatisect, 3-5 pairs, segments cuneate or oblong, incised or pinnatifid, lobes 3-7, short, mucronate, sometimes sparingly toothed; scape very simple, naked, surpassing the leaves, slender, 10' high; rays of the umbel 4-8, short, elongated after flowering; involucrel deeply parted, divisions ovate, 3-cleft at the summit, longer than the yellow flowers; fruit narrowly oblong, very smooth, much longer than the very short pedicel; teeth of the calyx short, not persistent; vittæ in the intervals large, often with very small accessory ones in each rib; section of the seed transverse, subquadrate.—*Hall & Harbour*, 221. Bear Creek, 17 miles west of Denver, *Vasey*. Near Denver, *Coulter*.

ARCHANGELICA GMELINI, DC.—Near Denver, *Dr. Smith*. Cañon City, *Brandegee*. Weston's Pass and Mount Lincoln, at 12,500 feet altitude, *Coulter*. *Hall & Harbour*, 219.

ARCHEMORA FENDLERI, Gr., *Pl. Fendl.*, p. 56. Root fasciculate-tuberoso; tubers 3-4, oblong, about 1'; stem simple, slender, 1°-2° high; leaves pinnate 5-7 foliolate, leaflets $\frac{3}{4}$ "-1 $\frac{1}{2}$ " long, those of the radical and lower cauline ones ovate or oblong, all incisely serrate throughout; petioles spathaceous at base; involucrels none; umbels small; fruit small, hardly 2" in length; oval, the wing-like margins narrower than the disk; vitta of the commissure 4, of which 2 are shorter; flowers white.—*Hall & Harbour*, 220. "In subalpine woods," near Cañon City, *Brandegee*. Mount Lincoln, at 12,500 feet altitude, *Coulter*.

PEUCEDANUM (?) NUDICAULE, Nutt. (?) Caulescent or sometimes scarcely so, minutely pruinose-pubescent, 3'-15' high; leafy only at base; leaves bipinnate or ternate-bipinnate, the segments incisely lobed with usually rather broad and subacute divisions; umbel somewhat capitate in flower, with 8-12 rays; involucre none; involucrels unilateral,

¹SESELI, L. Margin of the calyx 5-toothed, teeth short, somewhat thickened. Petals obovate, cuneate in an inflexed point, emarginate or subentire. Fruit oval or oblong, subterete in the transverse section, crowned by the reflexed styles. Ribs of the mericarp 5, slightly prominent or elevated, thickened and corky; lateral ones marginal and often a little broader. Intervals with a single vitta, rarely 2-3 vittæ. Carpopores 2-cleft. Albumen sub-semiterete.—*Koch, Fl. Germ.*

of 6-10 membranously margined, more or less united bracts; petals white, with an attenuated apex and quasi-obcordate; calyx-teeth short; fruit pubescent, broadly oval, 3"-4" long and 3" broad, the thickish wing more than half as wide as the seed; vittæ 3 in the intervals, 6 upon the commissure, conspicuous; seed flattened.—*Hall & Harbour*, 212.

SANICULA MARILANDICA, L.—Cañon City, *Brandegee*. Ute Pass, at 9,000 feet altitude, *Coulter*.

DAUCUS CAROTA, L.—Near Cañon City, *Brandegee*. Introduced.

HERACLEUM LANATUM, Mx.—Cañon City, *Brandegee*. Plains of the Platte and Twin Lakes, *Coulter*.

ARALIACEÆ.

*ADOXA*¹ *MOSCHATPELLINA*, L. Perennial, small and slender, herbaceous, 3' high; root tuberous; radical leaves 2-3 ternately compound, on long petioles, the cauline solitary, 1-2 ternate or incised; flowers 4-6, greenish, in a terminal capitulum, the lateral ones mostly pentamerous, the terminal tetramerous.—An alpine plant found also in the north of Europe and Asia. It exhales the odor of musk.—"Subalpine; common;" *Hall & Harbour*, 223; *Meehan*. Mount Lincoln, at 13,000 feet altitude, *Coulter*.

CORNACEÆ.

CORNUS CANADENSIS, L.—*Hall & Harbour*; *Parry*, 437.

CORNUS PUBESCENS, Nutt. (*C. sericea*, β. (†) *occidentalis*, T. and G.) Shrub 6°-8° high; branches sub-erect, branchlets spreading, more or less reddish, puberulent when young; leaves 1½'-4' long, ovate or elliptical, acute or acuminate, slightly pubescent, pale beneath, obtuse or acute at base; cymes crowded, pubescent, 1½'-2' in diameter; calyx-teeth minute; petals white, oblong-lanceolate, rather obtuse; stigma small, capitate; drupe subglobose, white, becoming lead-color.—"Without the calyx-teeth, enlarged stigma, and woolly pubescence of *C. sericea*, and nearer to *C. stolonifera*." *Watson*.—Platte River, *Coulter*.

CAPRIFOLIACEÆ.

LINNEA BOREALIS, Gronov.—*Hall & Harbour*, 224; *Dr. Smith*. Mount Lincoln at 10,000 feet altitude, *Coulter*. *oreophila Gray*

SYMPHORICARPUS MONTANUS, H. B. K. Shrub, 2°-4° high, branching widely; leaves very variable, orbicular, ovate, or ovate-lanceolate, acute or obtuse, entire or sharply cleft and lobed, soft-pubescent and ciliate or wholly glabrous and often glaucous, ½'-1½' long; flowers axillary, solitary on the ends of the short, leafy branches; bracts much shorter than the ovary; teeth of the calyx obtuse, glabrous or ciliate; corolla tubular or funnel-form, 2"-6", nearly glabrous within, usually light pink; stamens and style included; fruit globular or oblong, white.—*Hall & Harbour*, 225. Cañon City, *Brandegee*; *Candy*. Upper Arkansas, *Porter*. Weston's Pass, at 11,000 feet altitude, *Coulter*. *Empire*

¹ *ADOXA*, L. Flowers perfect. Tube of the calyx coherent with the lower part of the ovary; the limb slightly 2-3 cleft. Petals 4-5 inserted on the limb of the calyx, united at the base, spreading. Stamens 4-5, each filament 2-parted; the divisions bearing each a single-celled peitlate anther. Styles 4-5, subulate. Fruit an herbaceous and juicy berry, 4-5 celled, each cell with a single suspended seed. Seeds compressed, with a membranaceous margin.—T. & G. *Fl. N. Am.*

SYMPHORICARPUS OCCIDENTALIS, R. Br.—Hall & Harbour, 227. Cañon City, Brandegee. B. H. Smith. Near Denver and Colorado Springs, Porter.

LONICERA INVOLUCRATA, Banks.—Hall & Harbour, 226. Near Denver, Dr. Smith. Along streams in the foot-hills and among the mountains, Porter. Mount Lincoln, at 13,000 feet altitude, Coulter. *Camp*

SAMBUCUS RACEMOSA, L., var. PUBENS, Watson. (*S. pubens*, Mx.)—Wet Mountain Valley, Brandegee. Chicago Lakes, at 10,000 feet altitude, Mount Lincoln, at 12,000 feet, and Mount of the Holy Cross, Coulter.

VIBURNUM PAUCIFLORUM, Pylaie.—Hall & Harbour, 228.

RUBIACEÆ.

GALIUM APARINE, L.—Near Cañon City, Brandegee. Plains of the Platte, Coulter.

GALIUM ASPERRIMUM, Gr. *Pl. Fendl.*, p. 60. Stems diffuse, prickly backward on the angles; leaves all in sixes, lanceolate, attenuate at base, or the lower obovate-lanceolate and $\frac{3}{4}$ long, bristly-acuminate, glabrous, shining, very rough-prickly backwards on the margins and keel beneath, those of the branches small, much shorter than the peduncle; cymes paniculate, several-flowered, dichotomous; corolla 2" in diameter; petals 3-nerved, ovate, acuminate, white, rather large; ovary densely covered with short uncinuate hairs.—Cucharas River, Huerfano County, Greene.

GALIUM TRIFIDUM, L.—Hall & Harbour, 230.

GALIUM TRIFLORUM, Mx.—Plains of the Platte, Coulter.

GALIUM BOREALE, L. Very common everywhere among the mountains and exhibiting a great diversity of forms.—Hall & Harbour, 229; B. H. Smith; Coulter.

VALERIANACEÆ.

VALERIANA DIOICA, L., var. SYLVATICA, Watson. (*V. sylvatica*, Richards.)—Hall & Harbour, 231; Parry; Brandegee; Dr. Smith; Meehan. Twin Lakes and Clear Creek Cañon, Coulter.

VALERIANA EDULIS, Nutt.—Near Denver, Dr. Smith. Cañon City, Brandegee. Clear Creek Cañon and Bear Creek, Coulter.

COMPOSITEÆ.

LIATRIS PUNCTATA, Hook. Stems 8'-3° high from a thick, knotted, fusiform root, glabrate, leafy to the top; leaves linear, rigid, strongly punctate on both sides, glabrous or their margins sometimes ciliate, lower ones 3'-5' long, slightly 3-nerved, 1"-3" wide, pungently acute; heads in a dense spike, 4'-10' long, 4-6 flowered; flowers reddish-purple; scales of the cylindraceous involucre oblong, strongly punctate, imbricated, appressed, with mucronate, acuminate, rather spreading tips, margins woolly-ciliate; bristles of the pappus about 30, purplish or white, very plumose; achenia hairy.—Hall & Harbour, 315; Dr. Smith; B. H. Smith. North Park, Dr. Hayden. Rather common on the plains around Denver and Colorado Springs, Porter.

LIATRIS SCABIOSA, Willd.—South Park, *Canby*; *Porter*. Cañon City, *Brandegee*. Plains near Denver, *Coulter*.

PECTIS¹ (*Pectidopsis*) **ANGUSTIFOLIA**, Torr., *Ann. N. Y. Lyc.* 2, p. 214. Annual, very low, more or less branching from the base, nearly glabrous; leaves opposite, narrowly linear, punctate with large pellucid glands, somewhat connate at base, margins below fringed with a few bristles; heads on short peduncles on the ends of the branches; flowers yellow, those of the ray 7-8.—“Gravelly banks of streams.” *Hall & Harbour*, 297. Near Grand Cañon of the Arkansas, *Redfield*.

KUHNIA **EUPATORI**OIDES, L., var. **GRACILIS**, T. & G. Leaves numerous, shorter, linear and mostly entire, minutely pubescent, revolute on the margins; corymbs loose, paniculate.—Cañon City, *Brandegee*. Near Denver, *Dr. Smith*.

EUPATORIUM PURPUREUM, L.—Near Cañon City, *Brandegee*.

EUPATORIUM BERLANDIERI, DC. (*E. ageratifolium*, DC., var. *Texense*, T. & G.) DC. *Prod.* 5, p. 167. *Bot. Mex. Bound.* 2, p. 76; also var. *herbaceum*, Gr. *Pl. Wright.*, 2, p. 74. “Shrubby, glabrous; branches terete, striate; leaves opposite, petioled, ovate, acuminate, entire at base and apex with a few crenate teeth between, not glandular; branches opposite, corymbose at the apex; heads pedicellate, about 25-flowered; scales of the involucre in about 2 series, linear, acuminate; achenium angled, slightly scabrous on the angles; pappus almost twice shorter than the corolla.”

Var. Stem suffruticose only at base, minutely puberulent above but not glandular; leaves cordate or triangular-cordate, larger ones 2' long, 1½' broad, 3-nerved; scales of the involucre lanceolate or lance-linear; pedicels somewhat glandular; pappus nearly equaling the corolla; achenia slightly scabrous on the angles.—Wet Mountain Valley, *Brandegee*. *W. P. A.*

BRICKELLIA² **CALIFORNICA**, Gr. Scarcely-puberulent; stems numerous from a woody base, 1½' high, branching; leaves 9"-20" long, thickish, alternate, petioled, deltoid-ovate or subcordate, acutish, dentate, obscurely 3-nerved from the base, the under surface reticulated; heads medium-sized, nearly sessile in short axillary racemes, 10-12 flowered; involucre scales imbricated, obtuse, the outer ones appressed, very short, inner ones erect, elongated; achenia minute, finely pubescent, obscurely striate; pappus scabrous.—Cañon City, *Brandegee*.

BRICKELLIA GRANDIFLORA, Nutt. Stem 2'-2½' high, rather stout, paniculate at summit; leaves cordate-triangular, about 2' long, opposite or alternate, long petioled, coarsely serrate, glabrous or slightly pubescent, dotted with resinous globules beneath; heads middle-sized or very large, glomerate at the ends of the panicled branches, about 30-flowered; involucre scales in several series, imbricated, outer ones

¹PECTIS, L. Heads many-flowered; the flowers of the ray in a single series, ligulate pistillate; those of the disk perfect, tubular. Involucre cylindrical-campanulate; the scales about 8, in a single series, somewhat conduplicate. Receptacle naked. Corolla of the disk 5-toothed, regular. Branches of the style semi-cylindrical; short. Achenia crowded with a very short scariosus minutely about 5-toothed and somewhat lacinate pappus. T. & G. *Fl. N. Am.*

²BRICKELLIA, ELL, Gray, in *Pl. Wright*, 1, p. 84. Heads 4-50 flowered. Involucre imbricated; the scales striated, outer ones shorter. Receptacle flat, naked. Flowers all tubular; the corolla white or yellowish, cylindrical, scarcely expanded towards the summit; the teeth very short. Base of the style bulbous and often villous. Achenia with ten striae, sometimes obscurely 5-angled. Pappus of scabrous-barbellate or slightly plumose bristles.—Perennial herbs or suffruticose plants, with opposite or alternate leaves, and frequently the habit of *Eupatorium*.

herbaceous, ovate, with long subulate spreading tips, inner ones elliptical, acute or acutish, with scarious margins; achenia sparsely hairy above or glabrous; pappus deciduous.—*Hall & Harbour*, 313; *Parry*, 423; *Brandegee*; *Dr. Smith*; *B. H. Smith*; *Porter*. Sierra Madre Range, Twin Lakes, *Coulter*. Throughout the mountains, at all elevations.

NARDOSMIA SAGITTATA, Hook. *Fl. Bor. Am.* 1, p. 307. Leaves oblong, acute (or obtuse,) entire, sagittate, the lobes obtuse, DC., (leaves cordate or reniform-sinate, sinuate-toothed, tomentose beneath).—"Near Pike's Peak," *Hall & Harbour*, 314.

ASTER ASCENDENS, Lindl. *T. & G., Fl. N. Am.*, 2, p. 111. Stems low, ascending; branches simply racemose or somewhat corymbose; radical and lower leaves oblong-linear or narrowly spatulate, glabrous, entire, with ciliate-scabrous margins, the cauline linear-lanceolate, partly clasping; scales of the hemispherical involucre numerous, closely imbricated, unequal, nearly glabrous, the exterior linear-oblong, obtuse, the innermost acute; achenia minutely hairy.—*Meehan*. Cañon City, *Brandegee*. Twin Lakes, *Coulter*.

Var. *CILIATIFOLIUS*, T. & G. Low; stem not denuded and scapiform, pubescent above; leaves more proportionate, distinctly ciliated; scales of the involucre somewhat acute.—*Hall & Harbour*, 252; *Parry*, 419.

Var. *FREMONTII*, T. & G., *Fl. N. Am.*, 2, p. 503. Stem leafy, 4'-6' high, simple, bearing 1-2 heads, sometimes more, more or less woolly pubescent; leaves thin, cauline ones oblanceolate; scales of the involucre loose, exterior herbaceous, inner ones narrowly linear, acute; pappus white.—"Alpine and subalpine, in low grounds." Gray's Peak, *Dr. Smith*. Sierra Madre Range, *Coulter*.

Var. *PARRYI*, Watson. Stem 1°-2° high, often corymbosely much branched; leaves large, broadly oblanceolate, 5'-12' long, 1'-2' wide, narrowed into winged petioles, the upper ones gradually smaller and sessile, partly clasping; heads large; involucre scales finely ciliate, the outer ones broadly lanceolate with herbaceous tips, scarious below, loose; peduncles not glandular.—Sierra Madre Range, *Coulter*.

ASTER LEVIS, L.—Cañon City, *Brandegee*. Near Denver, *Dr. Smith*; *Hoopes*.

ASTER ERICOIDES, L., var. *STRICTUS*, Porter. Low, 3°-1° high, glabrous, except the scabrous margins and ciliate bases of the leaves, erect, slender, paniculately branched above, branches short; scales of the involucre narrowly linear, lax, outer ones very acute, often entirely green, inner ones scarious with a central green line; radical leaves narrowly oblanceolate.—"In the mountains at middle elevations," *Hall & Harbour*, 254. Near Denver, *Coulter*. Foot-hills west of Denver, *Porter*; *Meehan*; *Hoopes*.

ASTER MULTIFLORUS, Ait.—Near Denver, *Dr. Smith*. North Park, *Hayden*; *Coulter*.

ASTER FALCATUS, Lindl. Stem minutely pubescent with appressed hairs, 1°-1½° high, leafy to the top; leaves rigid, minutely appressed-pubescent or smoothish except on the edges, the lower ones spatulate-lanceolate, obtuse or acute; 2'-3' long, 4"-6" wide, short-stalked, the upper ones oblong-linear, sessile, often slightly clasping, those of the erect branches linear, often slightly falcate; heads terminal on the branchlets, flattened hemispherical, 4"-8" in diameter; scales much imbricated, the outer smaller with greenish, appressed or slightly spread-

ing tips and whitish chartaceous margins; achenia pubescent.—Twin Lakes, *Coulter*.

ASTER CARNEUS, Nees.—Wet Mountain Valley, *Brandegee*. On the Platte, near Denver, *Dr. Smith*.

ASTER ÆSTIVUS, Ait., var. *LÆTIFLORUS*, Gr. Varies in its smoother stem, which is slightly pubescent above, and the spreading tips of the involueral scales.—Cañon City, *Brandegee*.

ASTER OBLONGIFOLIUS, Nutt.—Huerfano County, *Greene*. *Milk-Park*

ASTER NUTTALLII, T. & G., var. *FENDLERI*, Torr. *Pac. R. R.*, 4, p. 97. (*A. Fendleri*, Gr. *Fl. Fendl.*, p. 66.) Stems many, from a subliguous caudex, erect or ascending, 9-12' high, rigid, rough-scrabrous; branches corymbose-paniculate, bearing one or rarely 2-3 heads; leaves sessile, rigid, coriaceous, small, linear, 6"-9" long, mucronulate, very entire, glabrous, 1-nerved, hispid-ciliate on the margins; lowest subspatulate, those of the branches very short; scales of the campanulate involucre in 3 series, linear-oblong, glandulose-scrabrous, mucronulate, outer ones herbaceous, obtuse, lax; inner ones acute, a little longer; achenia pubescent.—Pueblo, *Greene*. *Hall & Harbour*. Fremont County, *Brandegee*.

ASTER GLACTALIS, Nutt. Rhizoma thickish, not creeping; stems 2-4' high, erect, minutely pubescent above, bearing a single head, leafy or nearly leafless; leaves thickish, glabrous, spatulate-oblong and lanceolate, radical ones 1'-2' long, 2"-4" wide, narrowed into a long petiole, obtuse or even emarginate, canine ones oblong or oblanceolate, partly clasping; scales of the involucre nearly equal, linear-spatulate, more or less acuminate, glandular-puberulent or nearly glabrous, commonly blackish-purple; rays numerous, white or purplish.—⁶In the high alpine region, ⁷*Hall & Harbour*, 242. Mount Lincoln and White House Mountain, at 12,000 feet altitude, August, *Coulter*.

ASTER SALSUGINOSUS, Richards. Stem erect, simple, 6'-8' high, leafy, bearing 1-3 heads, pubescent above with appressed hairs; radical leaves broadly spatulate or linear-obovate, with the margined petiole 2'-9' long, wide, obtuse, glabrous, ciliate, canine ones lanceolate and ovate, sessile and partly clasping, very acute, often minutely downy; heads very large, single, or 3-5 on long peduncles thickened at the summit; scales of the involucre nearly equal, narrowly linear, glandular-pubescent, lax, with mostly squarrose-spread-lag or recurved, blackish tips, much shorter than the disk; rays long, bright purple; achenia somewhat hairy.—Gray's Peak, *Dr. Smith*. Twin Lakes, Weston's Pass, and Horse Shoe Mountain, at 11,000 feet altitude, *Coulter*.

ASTER ELEGANS, T. & G., var. *ENGELMANNI*, D. C. Eaton. (*A. Engelmanni*, Gr. *Sill. Jour.* (N. S.) 33, p. 9.) Stems several from a short creeping root-stock, 2'-3' high, very leafy; leaves sessile, lower ones oblong, obtuse, the upper ones larger, lanceolate and lance-ovate, often 3' long, nearly 2' wide, entire, scabrous on the margins, minutely puberulent like the stem and roughened, obscurely 3-nerved and feather-veined; inflorescence corymbose, heads peduncled; involucre turbinate-campanulate, 6"-10' wide; the scales ovate or oblong, acute, puberulent, the scarious margins densely lacinate-fringed; rays 8-12 in number.—Sierra Madre Range, August, *Coulter*.

ASTER GLAUCUS, T. & G. Stems 1'-2' high, branching, leafy, erect; lowest leaves scale-form, the others oblong-linear, closely sessile,

1-nerved, 1'-3' long, 3''-6'' wide, pointed, smooth and glaucous, veins prominently reticulated; heads in contracted corymbs; scales of the involucre in 3 or 4 series, lacerate-fringed, outer ones oval, obtuse, glabrous, inner ones lanceolate, membranous, acute, purple-tinged, as long as the disk; rays 14-17, purple or pinkish-white; achenia smooth or slightly pubescent.—North Park, *Hayden*. Eagle River, *Coulter*.

ASTER PTARMICOIDES, T. & G.—South Park, *Canby*. Garden of the Gods, *Porter*.

ASTER ANGUSTUS, T. & G.—*Hall & Harbour*, 291.

TOWNSENDIA¹ SERICEA, Hook. Stemless, from a simple or much branched caudex, 1'-2' high; leaves spatulate-linear, silky-canescens, acute, 1-nerved, 12''-15'' long, erect, surrounding and partly concealing the heads (8'' long) which are sessile or on very short peduncles; scales of the involucre subulate-lanceolate, pubescent, green in the center, purplish towards the tip; margins scarious, lacerate-ciliate; rays long; narrow, not spreading; pappus of the disk white, about as long as the corolla, pappus of the ray of several unequal subulate bristles, much shorter than the achenium and 1 or 2 long ones (sometimes 9 or 10) similar to those of the disk flowers; achenium hairy, hairs minutely capitate.—*Hall & Harbour*, 290. Cañon City, *Brandegees*. *Copie*

TOWNSENDIA GRANDIFLORA, Nutt. Strigose-canescens; stems many, from an annual root thickened at the summit, divaricately branched from the base, central ones short, erect, the lateral decumbent 5'-10' long, often proliferous; leaves 1'-2' long, somewhat succulent, linear-lanceolate, acute, scattered, the uppermost bracteate at the base of the heads; scales of the involucre lanceolate, subulate-acuminate, with fimbriate-ciliate margins, rays 25-30, pale lilac, with a short pappus composed of lacerate-denticulate squamellæ, very short; achenium minutely hairy.—*Hall & Harbour*, 289. Plains of the Platte, *Coulter*. Colorado Springs, *Porter*; *Redfield*.

MACHLERANTHERA² (DIETERIA) PULVERULENTA, Nees. Canescently puberulent; stems 3'-4' high, much branched from the base, branches spreading, bearing few heads on rather naked branchlets; lower leaves lanceolate, spinulose-serrate, upper ones linear, becoming entire; scales of the hemispherical involucre linear or lance-linear, very acute, imbric-

¹TOWNSENDIA, Hook. Heads large; the rose-colored or whitish rays in one series, rather long, pistillate, sometimes infertile; disk-flowers perfect, with tubular obconic 5-toothed corollas. Branches of the style lanceolate, acutish, hairy towards the ends. Involucres hemispherical or subglobose, of numerous rather large, imbricated and appressed, scarious-margined, lacerate-fringed and often tinted scales. Achenia flattened, pubescent or hairy, 2-3 nerved. Pappus of numerous stout barbellate bristles, that of the ray commonly shorter, or reduced in part or wholly to short subulate bristles or little scales.—Dwarf, stemless or branching, annual or perennial herbs, with crowded, linear or spatulate, entire radical leaves.—Natives of the mountainous regions east of the Sierras, from the Saskatchewan to New Mexico.

²MACHLERANTHERA, Nees. Heads many-flowered; the rays conspicuous, pistillate, fertile, in one species neutral; disk-flowers perfect, the corolla tubular, 5-toothed. Involucre ovoid-hemispherical, the scales imbricated in several series, oblong or linear, with spreading or recurved herbaceous points. Receptacle flat, honeycombed, the cells with toothed edges. Appendages of the style narrowly lanceolate, minutely hirsute. Anthers said to have "cultriform appendages." Pappus of numerous very unequal scarious and rather rigid bristles; that of the ray flowers somewhat shorter. Achenia obovate-fusiform, slightly compressed, indistinctly striate, pubescent or silky.—Herbs annual, biennial, or perennial, with branching stems and pinnatifid, toothed, or even entire leaves. Genus very near to *Aster*, but may be easiest distinguished from it by the unequal pappus of disk and ray. Consists of four species found in the region extending from Oregon to Colorado and southward to Mexico.

ented in about 3 series; rays numerous, pale purple or rose-color; appendages of the style subulate; achenia densely villose.—South Park, *Canby*; *Porter*.

MACHLERANTHERA CANESCENS, Gr. Minutely canescent with a soft pubescence; stem low, much branched, corymbose; leaves linear, entire or sparsely toothed towards the apex; scales of the obovoid involucre lanceolate, acute, imbricated in about 4 series, with slightly squarrose tips; rays 18-20, rather large, purplish-blue; appendages of the style subulate-lanceolate. T. & G., *Fl. N. Am.* 2, p. 101, under *Dieteria*, Nutt. —Exceedingly variable in its pubescence, inflorescence, size of the heads, toothing of the leaves, and involucre.—Georgetown, *Dr. Smith*.

Var. *LATIFOLIA*, Gr., *Pl. Wright*, 2, p. 75. (*Dieteria asteroides*, Torr., in *Em. Rep.*, p. 142.) Scabrous pubescent or puberulent; stems 18'-20' high; leaves oblong or lanceolate, sharply and rather coarsely toothed, broader leaves 6"-8" wide; involucre hemispherical, scales linear, in several series, with rather short, subulate, green, squarrose tips; heads large, variable in size.—Foot-hills, near Denver, *Porter*. Georgetown, *Dr. Smith*. Sierra Madre Range, *Coulter*.

Var. *ALPINA*, *Porter*. Dwarf, 2'-3' high, puberulent; radical leaves cuneate-spatulate, obtuse; stems short, bearing 1-2 large heads, 1' in diameter; scales of the involucre lance-linear, tips long, squarrose-spreading, glandular-pubescent.—Alpine. *Parry*, 1872.

MACHLERANTHERA TANACETIFOLIA, Nees. (*Dieteria coronopifolia*, Nutt. T. & G. *Fl. N. Am.* 2, p. 101.) Pubescent and somewhat viscid, diffusely branched below, branches 6'-12' long, branchlets terminated by single showy heads; radical and lower leaves bi-pinnatifid, petioled, the upper pinnatifid with the segments toothed or incised; scales of the involucre nearly equal, in about 3 series, linear, with a short, appressed, somewhat cartilaginous base, and very long, acute, loose, spreading, herbaceous tips; rays about 20, large, reddish-purple; appendages of the style subulate; pappus pale reddish-brown, copious, rather rigid; achenia obovate, many-striate, villous.—Hall & Harbour, 285. Cañon City, *Brandege*. *Canby*. Georgetown, *Dr. Smith*. Denver, *Redfield*.

DIPLOPAPPUS ERICOIDES, T. & G. *Fl. N. Am.* 2, p. 182. Strigosely canescent; stems 2'-6' high, branching from a suffrutescent base; leaves narrowly spatulate or linear, 2"-4" long, crowded, appressed or spreading, rigid, mucronate, often bristle tipped, conspicuously ciliate; heads terminal on the ends of the strict branches, rather small; scales of the involucre lanceolate-linear, in about 3 series, acute, 1-nerved, with scarious margins; rays rather short, white; exterior pappus very minute; achenia pubescent.—Hall & Harbour, 233. Cañon City, *Brandege*.

ERIGERON CANADENSE, L.—Near Cañon City, *Brandege*. Denver, *Dr. Smith*; *Coulter*.

ERIGERON DIVARICATUM, Mx.—Near Denver, *Dr. Smith*.

ERIGERON COMPOSITUM, Pursh. More or less canescently hirsute; stems 2'-6' high, several from a perennial root-stock, scape-like or with a few leaves near the base, and one or two linear bracts higher up; leaves on long petioles, 1-3 times ternately divided or parted, lobes oblong-linear, obtuse; scales of the involucre linear, in 2 rows, outer ones herbaceous, inner ones scarious with narrow margins and long slender tips; rays many, twice the length of the involucre; white, pale-pink, or blue; achenia hirsute; pappus of 12-15 bristles, with a few minute setae intermixed.—Hall & Harbour, 234. Gray's Peak, *B. H. Smith*.

Southwest Professor

Summit of Pike's Peak, *Porter*. Snow Mass Mountain, at 13,000 feet altitude, Mount Lincoln at 12,000 feet, and Long's Peak, *Coulter*. Sangre de Cristo Pass, *Brandege*. Gray's Peak, *Redfield*.

ERIGERON TRIPIDUM, Hook. *Fl. Bor.-Am.* 2, p. 17, t. 120. Hirsute; stems 2'-3' high, leafy below, naked or scape-like with 1-2 linear bracts, bearing a single head; leaves on long petioles, deeply 3-cleft or lobed, segments short, very obtuse, the middle one orbicular, the lateral occasionally 2-lobed; scales of the involucre lance-linear, hirsute, about the length of the disk; rays twice as long, white or blue, rather broad; achenium minutely hairy; pappus hispid-scabrous, as long as the disk of the corolla. Alpine.—White House Mountain, at 13,000 feet altitude, *Coulter*.

ERIGERON UNIFLOREM, L. Sparsely pubescent, becoming somewhat glabrous; stem 3'-6' high, bearing a single head; lower leaves spatulate, cauline lanceolate or linear, obtuse or acute, entire; pistillate flowers nearly all ligulate; rays somewhat erect, scarcely twice the length of the very woolly involucre; wool deep-purple or sometimes light-colored, or white.—*Hall & Harbour*, 243. Snow Mass Mountain, at 13,000 feet altitude, and Mount Lincoln, at 12,000 feet, *Coulter*.

ERIGERON GRANDIFLOREM, Hook. Perennial, hirsute and somewhat woolly; caudex thick; stems 1-5, 3'-8' high, rather leafy, bearing a single head; radical leaves oblong-spatulate, 1'-2' long, 2"-3" wide, those of the stem smaller and linear-lanceolate; heads solitary, large; involucre very woolly; scales herbaceous, elongated, with naked purple tips; rays numerous, long, white or purple; achenia sparingly hirsute; pappus of barbellate setæ rather shorter than the disk corollas, and with a few very short ones intermixed.—Mount Lincoln, at 12,000 feet altitude, July, *Coulter*.

VAR. ELATIUS, Gr. *Sill. Jour.* (N. S.) 33, p. 8. 1°-2° high, very leafy, pilose; lower leaves oblong-lanceolate, tapering to the base; all the leaves scabrous-pubescent, mucronate-apiculate; upper ones ovate and ovate-lanceolate, or sometimes narrowly lanceolate, sessile by a somewhat clasping base; heads solitary or corymbose, 2-6, large; involucre often 1' broad, densely woolly; rays numerous, narrow, pale-pink.—Differs so much from the typical form that it might well constitute a distinct species.—*Hall & Harbour*, 238; *Dr. Smith*. Weston's Pass and Sierra Madre Range, *Coulter*.

ERIGERON GLANDULOSUM, *Porter*, (n. sp.) Minutely glandular-puberulent, and hirsute with long, scattered, spreading, jointed hairs; stems simple, one or several from a thick, woody, often branched caudex, bearing single heads; leaves narrowly spatulate, radical ones 2'-4' long; heads, including the numerous purple or blue rays, 9"-15" broad; scales of the involucre in about 3 series, equaling the disk, lance-linear, inner ones scarious, more or less purplish; achenia sparingly hirsute; pappus with shorter bristles intermixed with the longer ones.—Near *E. ursinum*, Eaton, in *King's Rep.*, v. 5, p. 148.—*Hall & Harbour*, 235. Clear Creek Cañon, Boulder Cañon, and Twin Lakes, *Coulter*.

ERIGERON ARMERLEFOLIUM, Turcz. Gray, *Proc. Am. Acad.* v. 8, p. 648.—*Hall & Harbour*, 232, (as *E. acre*, Y.) South Park, *Porter*. Twin Lakes and on the Upper Arkansas, *Coulter*.

ERIGERON BELLIDIASTRUM, Nutt. Annual, hirsute-pubescent, 1° or more high; stem corymbosely much branched, leafy throughout; branches elongated and divaricately spreading; lower leaves on slender

petioles, entire and oblanceolate, cauline ones sessile, smaller, oblong-linear or linear-spatulate; heads few or many, rather small, terminating the branches, pedunculate; involucre hirsute-canescens; rays very many (60-70,) white or pale-red, narrowly linear, twice as long as the involucre; achenium minutely pubescent; pappus simple and wholly deciduous from a broad and white epigynous disk.—Plains and mountains. South Park, *Canby*. Colorado Springs, *Porter*.

ERIGERON MACRANTHUM, Nutt. Pubescent or nearly smooth; stems 9'-30' high, several from a creeping rhizoma, leafy to the summit; leaves smooth or hairy, ciliate on the margins, obtuse, acute or acuminate, mucronulate, entire, the lowest oblong-spatulate, tapering into a petiole, 2'-4' long, 6"-8" wide, the upper oblong or broadly ovate lanceolate, 3-nerved, the lateral nerves starting from the base, partly clasping; heads several, 3-13, corymbose, sometimes very large; involucre of many very narrow-linear, acuminate, herbaceous, glabrous or glandular scales, which are sometimes pubescent; rays blue or purple, numerous; achenia 2-3 nerved, slightly hairy; outer pappus of short, slender setae.—Varies greatly as to the amount of pubescence.—South Park and Chisau Cañon, *Porter*. Pike's Peak and mountains west of Denver, *Canby*. Twin Lakes and in the Sierra Madre Range, *Coulter*.

ERIGERON GLABELLUM, Nutt. Pubescent or nearly glabrous; stems 9'-20' high, single or few from a short erect caudex, simple or sparingly corymbose at the summit; radical leaves narrowly or broadly spatulate, tapering into a long or short petiole, sometimes serrate or incisely toothed; lower cauline ones oblong, lanceolate, tapering into long, margined petioles, the upper ones scattered, lanceolate or linear, sessile and partly clasping; heads few, large, 10"-15" broad, on long, strict peduncles which are enlarged above; rays very narrow and numerous; involucre hirsute or nearly smooth; achenium and pappus as in the last.—*Hall & Harbour*, 240. Cañon City, *Brandegee*. Gray's Peak, *Dr. Smith*.

ERIGERON COULTERI, *Porter*, (*n. sp.*) Stem simple from a slender root, 6'-12' high, bearing a single head, smooth below, pilose-pubescent above, leafy to the top; leaves thinnish, pubescent with ciliate margins, all more or less serrate-denticulate, mucronate, erect, gradually diminishing in size upward; lower ones oblong-spatulate or elliptical, tapering into a margined, ciliate petiole, upper ones oblong or lanceolate, acute or acuminate, sessile and partly clasping; head large, 1'-2' broad including the numerous white rays; involucre about 9" broad, hemispherical, densely pilose but scarcely woolly; scales lance-linear, with scarious margins, tips elongated, subulate, spreading, glandular; achenia pubescent; bristles of the pappus minutely scabrous, outer ones short and few; alveoli of the receptacle rough, with lacerate margins.—Weston's Pass, at 10,000 feet altitude, July 19, *Coulter*.

ERIGERON PUMILUM, Nutt. Very hirsute with spreading hairs, stems 6'-10' high, rather stout, numerous from an erect, branching caudex, simple or sparingly branched, bearing 1-3 peduncled heads, leafy; lower leaves linear-spatulate, 2'-2½' long, 1'-3" wide, upper ones narrowly linear, passing into subulate bracts; heads 9"-12" broad; scales of the involucre numerous, nearly linear, hirsute; rays white, 30 of them, 1' wide, twice or nearly three times as long as the involucre; achenia slightly hairy; outer pappus of minute subulate bristles.—Upper Arkansas, *Porter*. Saint Vrain River, *Coulter*.

ERIGERON DIVERGENS, T. & G. Somewhat hoary with a minute hirsute pubescence, diffusely branched from the base, branches ascending,

4'-12' long; leaves small, entire, acute, the radical somewhat spatulate, narrowed into a short petiole, the cauline scattered, sessile, linear, narrowed at the base; heads small, mostly solitary, terminating the naked branchlets or peduncles; rays very narrow and numerous, twice the length of the hirsute involucre, purplish; inner pappus of few, very slender and deciduous bristles.—*Hall & Harbour*, 237 and 246; *Hoopes*. Chicago Lakes, at 12,000 feet altitude, *Coulter*. *Brandege*; *Dr. Smith*. Colorado Springs, *Porter*.

ERIGERON CANUM, Gr., *Pl. Fendl.*, p. 67. Stems 3'-4' high, simple leafy to the summit, from a thick root, caespitose, bearing single heads, silky-canescenscent as well as the very entire, linear-spatulate leaves; rays white, in about one series, twice longer than the white-hirsute involucre; achenia very glabrous, narrow, with about 10 conspicuous ribs; pappus of the ray and disk similar, double, the outer of very short subulate setaceous bristles.—"Common on low mountains," *Hall & Harbour*, 244 (as *E. caespitosum*, Nutt.)

GUTIERREZIA¹ EUTHAMIA, T. & G. Stems woody and much branched at the base, numerous, 6'-15' high, angled, leaves crowded, narrowly linear, acute, attenuate at the base, 1'-2' long, $\frac{1}{2}$ "-1" wide, 1-nerved, scabrous, punctate, resinous and sometimes varnished; corymb compound, fastigiate, contracted; heads small, glomerate, turbinate-cylindrical; involucre scarcely 2" long and 1" broad, narrowly obovate; flowers of the ray 2-5, the disk 3-6; pappus of 9-10 obtuse, unequal, erose-denticulate, chaffy scales, a little shorter than the achenium.—*Hall & Harbour*, 294. Cañon City, *Brandege*. Near Denver, *Dr. Smith*. *Canby*.

SOLIDAGO VIRGA-AUREA, L., VAR. MULTIRADIATA, T. & G. Stems villose-pubescent especially towards the summit, mostly simple, 8'-15' high; leaves ciliate, oblong-lanceolate; radical ones obovate and narrowed into a petiole; heads large, in a dense compound raceme or loosely corymbose; scales of the involucre ciliolate, acute; rays 8-18.—*Hall & Harbour*, 251. Sierra Madre Range and Twin Lakes, *Coulter*. Georgetown, *Dr. Smith*.

VAR. ALPINA, Big.—Gray's Peak, *Dr. Smith*. South Park, Twin Lake Creek and Horse Shoe Mountain, at 11,000 feet altitude, *Coulter*.

VAR. HUMILIS, Gr. (*S. humilis*, Pursh.)—Sierra Madre Range, *Coulter*.

SOLIDAGO GUIRADONIS, Gr., *Proc. Am. Ac.*, v. 6, p. 543. Smooth, stem slender, erect, 2 $\frac{1}{2}$ "-3" high, from a woody rhizoma; lowest leaves lanceolate, 6' long, 3'-5' broad, tapering into a margined petiole, the cauline ones very narrowly linear, 2'-3' long, 3'-5' broad; panicle erect, not one-sided, very narrow and composed of few and rather small heads; involucre scales, linear, acuminate, the midvein broad and

¹ GUTIERREZIA, Lagusca. Heads small or middle-sized, 6-90 flowered; the rays pistillate, fertile; the disk-flowers tubular, perfect and fertile. Involucre varying from narrowly-obovate to broadly-hemispherical; the scales closely imbricated in several series, rigid, and with greenish herbaceous tips. Receptacle naked. Corollas yellow; of the ray oval, oblong or linear; of the disk funnel-shaped, 5-toothed, the teeth erect or recurved. Branches of the style in the ray-flower, linear, smooth; the stigmatic lines extending to the top; in the disk with the hairy appendages shorter or several times longer than the stigmatic portion. Achenia oblong or obconic, terete or somewhat compressed. Pappus of the disk composed of several oblong or linear chaffy scales, or reduced to a lacinate coroniform border; of the ray similar to that of the disk, but commonly smaller or sometimes obsolete.—Mostly perennial and suffruticose plants of North and South America, with glabrous and often resinous-dotted or varnished linear and entire, or broader and denticulate leaves.

prominent; rays 8-9, scarcely longer than the 10-12 flowers of the disk; achenia puberulent.

Var. *SPECTABILIS*, D. C. Eaton, *King's Rep.*, v. 5, p. 154. Stem stout, 3^o-4^o high; lower and radical leaves broadly oblanceolate, 8'-12' long, $\frac{1}{2}$ '-1 $\frac{1}{2}$ ' wide, the petiole dilated at the base, upper ones sessile, lanceolate; panicle oblong, densely many-flowered; heads rather large, involueral scales oblong-linear, mostly obtuse; flowers of the ray 12-15, of the disk about 20.—The affinities of this plant seem to us to connect it rather with *S. speciosa* than *S. Guiradonis*.—Glen Eyrle, Porter. Cañon City, Brandegee.

SOLIDAGO PUMILA, T. & G. Cespitose, glabrous and somewhat resinous; stems 4'-9' high, very many from a stout underground woody caudex; leaves crowded, narrowly lanceolate, strongly 3-nerved, very acute and somewhat mucronate, the radical ones 2'-3' long, 2''-3'' wide, narrowed into a short petiole; heads sessile in little clusters, which are arranged in a dense fastigate corymb; involucre cylindrical-oblong, the closely imbricated scales carinate, ovate or oblong, obtuse, with scarious margins and appressed, scarcely herbaceous tips, rather obtuse; rays 1-3; disk flowers 3-4; achenia glabrous.—Colorado, Vasey.

SOLIDAGO RIGIDA, L., var. *HUMILIS*, Porter. Stems 12'-18' high, slender; cauline leaves oblong-lanceolate, mostly acute, very scabrous; heads of flowers smaller; scales of the involucre narrower.—Rather frequent. Wet Mountain Valley, Brandegee. Porter; Coulter. Near Denver, Dr. Smith.

SOLIDAGO NEMORALIS, Ait. Very variable, presenting in the Rocky Mountain region a great diversity of forms, among which the most conspicuous is

Var. *MOLLIS*, Bartl. (†) *Fl. N. Am.*, v. 1, p. 229. Stem-leaves obovate or oval, crowded, often 2'-2 $\frac{1}{2}$ ' long, 1'-1 $\frac{1}{2}$ ' broad; low, about 1^o high, rather stout; branches of the panicle much contracted or somewhat spreading; heads rather larger.—Platte River near Denver, Dr. Smith. Twin Lakes, Coulter.

SOLIDAGO MISSOURIENSIS, Nutt.—Hall & Harbour, 249. Eastern plains of Colorado, Dr. Smith. Near Denver, Porter.

SOLIDAGO CANADENSIS, L.—Wet Mountain Valley, Brandegee. Eagle River, Coulter.

SOLIDAGO LANCEOLATA, T. & G.—Hall & Harbour, 247. Cañon City, Brandegee. On the Platte, Dr. Smith.

SOLIDAGO OCCIDENTALIS, T. & G. Very near the last, but differs in its more paniculate and less corymbose inflorescence; flowering branches more strict, with the upper leaves becoming very small and linear; heads of flowers pedicellate; scales of the involucre loosely imbricated. Some of its forms, however, appear to approach *S. lanceolata* too closely.—Georgetown, Dr. Smith.

*BIGELOVIA*¹ *HOWARDII*, Gr., *Proc. Am. Acad.*, v. 8, p. 641 (*Linogyris How-*

¹*BIGELOVIA*, DC. (*Linogyris*, Lobel, *Chrysothamnus*, Nutt.) Heads 5-many-flowered, the (yellow) flowers all tubular and perfect. Involucre obconic or campanulate; the somewhat rigid and carinate scales imbricated in several series; the innermost elongated; the outer ones shorter and passing into the leaves. Receptacle alveolate-toothed, the teeth lacerate, or sometimes becoming cuspidate processes. Corolla slender, the expanding limb 5-cleft. Style with flattened branches; the stigmatic portion oblong or linear; the pubescent appendages lanceolate or often elongated. Achenia oblong, villous or pubescent, sometimes glabrous. Pappus of copious unequal scabrous capillary bristles. Perennial herbs or suffruticose plants, branched from the base and corymbose or sub-paniculate at the summit, often resinous and having a strong balsamic but unpleasant odor; leaves linear or lanceolate, sessile.

ardii, Parry, *Proc. Amer. Acad.*, v. 6, p. 541.) Shrubby, 6'-18' high; younger branches white-woolly; leaves linear, 1-nerved, from webby becoming smooth, 1'-2' long, the uppermost about as long as or exceeding the corymbose, crowded heads; involucre cylindrical, 5-6 flowered; scales rather loose, all of them finely acuminate; tube of the pale yellow corolla sparingly villous; achenia linear, pubescent.—Parry. Wet Mountain Valley, *Brandegee*.

BIGELOVIA PARRYI, Gr., *Proc. Am. Acad.*, v. 8, p. 642. (*Linosyris Parryi*, Gr. *Proc. Acad. Phil. March* 1863, p. 66.) Shrubby, 9'-18' high; branches virgate, white woolly, becoming smooth; leaves 2'-4' long, linear, almost glabrous, sub-viscous, 3-nerved, acute, plane, larger ones 2" wide and tapering to the base; floral leaves similar, far surpassing the heads which are crowded in a narrow thyrsus; heads about 9" long, foliose-bracteate; involucre 10-15 flowered, cylindraceous, series few, scales sublaev, imbricate, whitish, lanceolate, all attenuate acuminate; tube of the corolla hirsutulous; achenia linear, hoary-pubescent.—Hall & Harbour, 293; Parry, 413; Canby. Mount Elbert near Twin Lakes, at 10,000 feet altitude, *Coulter*.

BIGELOVIA BIGELOVIA, Gr., *Proc. Am. Ac.*, v. 8, p. 642. (*Linosyris Bigelovii*, Gr., in *Bot. Whipl.* 42, t. 12.) Subcinereous, woody, very much branched, 2° high and more; branches rigid, slender, broom-like, younger ones whitened; leaves revolute on the margins, filiform; involucre 5-flowered, narrow, scales chartaceous, of the same color, moderately carinate, appressed, outer ones oblong-lanceolate, woolly-ciliate, rather acute, inner ones narrower, often acuminate; limb of the corolla narrow, shortly 5-lobed; bristles of the pappus scarcely rigid, longer than the corolla; appendages of the style elongate-subulate or filiform, hispidulous, mostly longer than the linear stigmatic portion; achenia very glabrous, linear, 4-6 angled, with a broad epigynous disk.—Wet Mountain Valley, *Brandegee*. The specimens vary from the typical form in their smaller heads and more spreading scales of the involucre.

BIGELOVIA DEPRESSA, Gr., *Proc. Am. Acad.*, v. 8, p. 643. (*Chrysothamnus depressus*, Nutt; *Pl. Gamb.*, p. 171. *Linosyris depressa*, Torr., *Sitgreaves' Rep.*, p. 161.) Glabrous, woody; branches a span high from a decumbent base; leaves lanceolate or oblanceolate, mucronate-acute, short, 6" long, rigid; scales of the involucre elongated-lanceolate, gradually acuminate, smooth, chartaceous, of the same color; lobes of the corolla short; bristles of the pappus rigid, longer than the corolla; achenia very smooth, 4-6-angled, with a broad epigynous disk.—Collected by Parry in the Sangre de Cristo Range.

BIGELOVIA GRAVEOLENS, Gr., *Proc. Am. Acad.*, v. 8, p. 644. (*Linosyris graveolens*, T. & G., *Fl. N. Am.*, 2, p. 234.) Shrubby, very much branched, 1°-4° high, branches pulverulent-tomentose, whitish, sometimes smooth and greenish; leaves narrowly linear, not punctate, broader ones 3-nerved, narrower ones 1-nerved, 1'-2' long, $\frac{1}{2}$ "-1" wide; heads large, 5-flowered, clustered, corymbose or paniced; involucre oblong, 4" long, 1" wide, scales few, imbricated in about 3-series, glabrous, 5-ranked, carinate, outer ones very short, innermost linear, half as long as the brilliant yellow flowers; appendages of the style linear-subulate, longer than the stigmatic portion; pappus of very fine soft bristles nearly as long as the corolla; achenia hairy.—Hall & Harbour, 292. Cañon City, *Brandegee*. Canby. Denver, *Dr. Smith*. On the Platte, *Coulter*.

BIGELOVIA DOUGLASSII, Gr., *l. c.*, p. 645. (*Linosyris viscidiflora*, T. & G. *l. c.*) Shrubby, densely branching, 1° high, older branches with gray bark, younger ones smooth, slightly angled; leaves narrowly or broadly

linear or lanceolate, rigid, 8"-12" long, glabrous, or slightly scabrous on the margins; heads small, 5-6-flowered, clustered in dense flat corymbs; involucre 2½"-3" long, obconic, of loosely imbricated, glabrous, sometimes resinous or glutinous, oblong-linear, obtuse scales, the outer ones very short; corolla at first scarcely exerted, but as the achenium grows it considerably exceeds the involucre; style as in the last; achenia hairy; pappus of rather rigid and scabrous setae.

Var. *STENOPHYLLA*, Gr., l. c., p. 646. Leaves very narrowly linear or filiform; heads 3-5-flowered.—Wet Mountain Valley, *Brandegee*.

Var. *LATIFOLIA*, Gr., l. c., p. 646. (*Linosyris viscidiflora*, var. *latifolia*, Eaton in *King's Rep.* 5, p. 157.) Leaves oblong, 1'-1½' long, 5"-6" wide.—North Park, *Dr. Hayden*.

Var. *SERRULATA*, Gr., l. c., p. 646. (*Linosyris serrulata*, *Toit* in *Stansb. Rep.*, p. 389.) Margins of the leaves ciliate or minutely serrulate, with very short rigid bristles, otherwise nearly glabrous.—*Hall & Harbour*, 295. South Park, *Canby*; *Porter*. Upper Arkansas, *Coulter*. Wet Mountain Valley, *Brandegee*.

Var. *TORTIFOLIA*, Gr., l. c., p. 646. Like the preceding, but the leaves spirally twisted.—Rather common. Upper Arkansas, *Porter*. South Park, *Coulter*. Wet Mountain Valley, *Brandegee*.

*APLOPAPPUS*¹ *RUBIGINOSUS*, T. & G. Viscidly pubescent and cinereous; stems erect or decumbent, corymbosely branched, 10'-18' high; leaves lanceolate or narrowly oblong, lacinate-incised, the divaricate teeth produced into pellucid bristles; heads subglobose, few or many, corymbose, terminating the leafy branches, often bracteate; scales of the involucre linear, acute, bristle tipped, viscidly puberulent, in about 2 series, nearly equal, loose, at length spreading; alveoli of the receptacle pilose-fimbriate; achenia turbinate, densely silky-villous; pappus reddish brown.—Platte River, near Denver, *Dr. Smith*. *Hall & Harbour*, 287.

APLOPAPPUS *SPINULOSUS*, DC. Herbaceous, canescent with a soft, minute, woolly pubescence; stems many, 1°-2° high, corymbosely branched above; leaves small, 9"-12" long, rigid, pinnately or somewhat bi-pinnately parted, segments short, linear-subulate, mucronate with a short bristle; heads small, subglobose, terminating the numerous branchlets; involucre shorter than the disk, scales subulate-lanceolate, mucronulate, imbricated in 3-4 series, appressed, canescent; rays 20-30; corolla of the disk with very short teeth; pappus pale or tawny, short, very unequal; achenia turbinate, villous.—Cañon City, *Brandegee*. Plains near Denver, *Dr. Smith*. *Hall & Harbour*, 288; *Canby*. Colorado Springs, *Redfield*.

¹ *APLOPAPPUS*, Cass. (*Macronema*, *Ericameria*, *Stenotus*, *Insypus*, *Aplopappus*, *Pyrocoma* and *Prionopsis* of *Torrey & Gray's Flora*.) Heads few-many-flowered; ray-flowers 3 many, pistillate, fertile; those of the disk tubular, perfect, generally fertile, involucre cylindrical, turbinate, campanulate, or hemispherical; the scales imbricated in few-several series, from linear-subulate varying to broadly oval, with or without foliate tips; the outer ones sometimes smallest, sometimes very large and leaf-like. Receptacle flat, alveolate. Corolla of the disk funnel-shaped, or slightly dilated upward, 5-toothed. Style of the disk flowers with the branches flattened, sometimes broadly lanceolate, but more frequently much elongated, the anulate hispid appendages much longer than the stigmatic portion. Achenia oblong or linear, mostly torcite or turbinate, villous or pubescent, rarely glabrous. Pappus simple, white or brownish; of copious, mostly unequal scabrous, somewhat rigid or soft capillary bristles.—Perennial herbs or suffruticose plants, with entire or pinnately-toothed or serrate leaves; the heads often large and solitary, but sometimes smaller and corymbose or somewhat panicled. Natives of Western North America and parts of South America; the flowers always yellow, but showing great diversity in the size of the heads and in the rays, styles, pappus, etc. The few rayless species are not easily separated from *Linosyris*.

APLOPAPPUS MACRONEMA, Gr., *Proc. Am. Acad.*, v. 6, p. 542. (*Macronema discoidea*, Nutt.) Branches erect from a woody base, 6'-9' high, terete, white-tomentose; leaves spatulate-oblong, obtuse, apiculate, 8'-12' long, 2'-3' wide, obscurely 3-nerved, minutely glandular and scabrous; heads single or few in a corymb, turbinate; scales of the involucre few, sub-equal, broadly lanceolate, glandular, the outer ones more or less herbaceous; heads about 25-flowered; rays none; branches of the style very long, filiform, much exserted, the hispid portion twice as long as the stigmatic; achenia pubescent.—*Hall & Harbour*, 296. Twin Lakes and Sierra Madre Range, *Coulter*.

APLOPAPPUS PYGMAEUS, Gr. (*Stenotus pygmaeus*, T. & G. *Fl. N. Am.* 2, p. 237.) Stems 1'-2' high from a branching caudex, 1-flowered; radical leaves oblong-spatulate, 1'-1½' long, obtuse, somewhat 3-nerved, fimbriate-ciliate; cauline leaves 3-4; head bracteate; outer scales of the involucre foliaceous, oblong, or broadly obovate, very obtuse, pubescent, inner ones oblong, rather acute, tinged with purple; rays 12-16, shorter than the scales of the involucre; achenium pubescent. Alpine.—*Hall & Harbour*, 256. La Plata Mountain, at 14,000 feet altitude, *Coulter*. Sangre de Cristo Pass, *Brandegee*. Gray's Peak, *Dr. Smith*; *Meehan*.

APLOPAPPUS LYALLI, Gr., *Proc. Am. Acad.*, March, 1863, p. 64. *Note*. Pruinose-glandular throughout; stems 2'-3' high, leafy, monocephalous; leaves very entire, sub-membranous, generally mucronate; radical and lower ones oblong-spatulate or oblanceolate, attenuate at the base, uppermost lanceolate; scales of the involucre loosely imbricated in about 3 series, lanceolate, of nearly equal length, inner ones acuminate with red tips, glandulose-puberulent; ligules 16-20, linear, rather long; achenia almost linear, very glabrous; hairs of the pappus white, rather rigid, equaling the corolla of the disk. Alpine.—*Parry*, 1872.

APLOPAPPUS INULOIDES, T. & G. Tomentose-woolly throughout, the pubescence mostly persistent; stems branching from a woody caudex, ascending, 4'-7' long; radical leaves lanceolate, acute, tapering to the base, entire, cauline ones lanceolate or oblong-lanceolate, sessile, partly clasping; heads solitary, large; involucre about 1' in diameter, scales in several series, oblong, obtuse or acute, pubescent or woolly; rays very numerous, scarcely twice the length of the involucreal scales, deep yellow; achenia hairy. Subalpine.—*Hall & Harbour*, 155. Sierra Madre Range, *Coulter*.

APLOPAPPUS CROCEUS, Gr., *Proc. Am. Acad.*, Mar., 1863, p. 65. *Note*. Stem 1'-1½' high, sparingly leaved, monocephalous, at first woolly; leaves coriaceous, glabrous, very entire, not conspicuously reticulated; radical ones oblong-lanceolate, with the petiole 6'-10' long, cauline lanceolate or oblong, partly clasping at base; head naked, very large; involucre hemispherical, 1' in diameter; scales oval, very obtuse, inner ones somewhat erose-scabrous on the margin; rays 50 or more, much exserted, nearly 1' long, saffron-colored above; ovaries short, very smooth; pappus whitish, equaling the corolla of the disk. Subalpine.—*Hall & Harbour*, 257. Middle Park and Sierra Madre Range, *Coulter*.

APLOPAPPUS FREMONTII, Gr., *Jour. Bot. Nat. Hist. Soc.*, v. 5. Glabrous; stems erect or ascending from a woody base, 6'-12' high, corymbosely branched above, leafy; leaves oblong, or linear-oblong, sessile, partly clasping at the base, acute with a mucronate tip, entire or occasionally somewhat denticulate; lower ones 2'-2½' long, 6'-7" wide, tapering to the base; upper ones clasping by a broad base; heads terminating the leafy branches, globose, about 1' in diameter; scales of the

involucre in 3-4 series, lance-ovate, with acuminate, spiny tips, somewhat villous-pubescent, with narrow, scarious margins; rays 6"-8" long, lance-ovate, yellow; pappus a little shorter than the corolla and rather longer than the very smooth achenium.—Low Mountains, lat. 39°. *Hall & Harbour*, 258. Cañon City, *Brandegee*. *Meehan*.

APLOPAPPUS PARRYI, Gr. Stems 1-3 from a branching caudex, subviscous-puberulent above, 12'-16' high; leaves almost glabrous, very entire, lower ones oblanceolate or spatulate, tapering to the base, obtuse, the others acute, upper ones broader at the base, partly clasping; heads numerous, corymbed, on short pedicels; scales of the campanulate involucre broad lanceolate, somewhat coriaceous, with somewhat leafy tips, loose; rays 15-20, small, yellow, narrowly-linear, but little longer than the disk flowers; pappus white, not rigid.—*Hall & Harbour*, 259; *Parry*; *Canby*. Chiann Cañon, *Porter*. Twin Lakes and Sierra Madre Range, *Coulter*.

GRINDELIA¹ SQUARROSA, Dunal. Glabrous and viscidly resinous; stems herbaceous from a perennial caudex, 1° to 2° high, corymbosely branched above; leaves somewhat rigid, glaucous and punctate, radical ones spatulate-lanceolate, narrowed into a petiole, dentate or incised, cauline mostly oblong, sessile and partly clasping, rather obtuse, finely toothed or spinulose-serrate; heads numerous, subglobose, 6" broad; the scales very rigid, close-appressed, but with very long reflexed, squarrose, subulate points, resinous; rays numerous, rather narrow; pappus of 2-4 very rigid, deciduous bristles or awns.—Very common on the plains. *Hall & Harbour*, 286. Denver, *Dr. Smith*. Colorado Springs, *Porter*. *B. H. Smith*. On the Platte, *Coulter*.

CHRYSOPTIS VILLOSA, Nutt. Extremely variable in the size and shape of the leaves, in the number of the flower-heads, and in the kind and amount of pubescence. It includes several nominal species.—Common everywhere at all elevations. *Hall & Harbour*, 260; *Dr. Smith*; *B. H. Smith*; *Canby*; *Porter*; *Brandegee*; *Coulter*.

CONYZA² COULTERI, Gr., *Proc. Am. Acad.*, v. 7, p. 355. (*C. subdecurrens*, Gr., *Pl. Fendl.*, p. 78, and *Pl. Wright*, 1, p. 102, non DC.) Softly viscous-pubescent; stem 1° to 2° high, with strict branches, leafy to the top; leaves adnate, sessile, linear-oblong or the lower spatulate, numerous, pinnatifid-dentate or incised; panicle crowded, virgate; heads small, 1½" long; involucre shorter than the disk, scales hairy-viscous, linear, acute.—Cañon City, *Brandegee*.

BACCHARIS SALICINA, T. & G. *Fl. N. Am.* 2, p. 258. Shrubby, smooth, branches angular; leaves mostly oblong-lanceolate, about 1'

¹ **GRINDELIA**, Willd. Heads many-flowered; the ray-flowers generally present, pistillate, the ligule elongated; disk-flowers perfect, the corolla tubular-funnel-shaped, 5-toothed. Involucre subglobose or hemispherical, the scales imbricated in many rows, often with squarrose tips. Receptacle naked, flat, foveolate. Style with lanceolate, or hispid appendages as long as the stigmatic portion. Achenium smooth, oblong, or ovate, somewhat angled. Pappus of 2-5 smooth rigid, deciduous awns, shorter than the disk-corolla.—Bisexual (?) perennial or suffruticose, often resiniferous, Mexican and North American plants. Leaves entire or serrate, often punctate, the cauline ones sessile. Heads corymbed at the ends of the branches, or solitary, mostly rather large.

² **CONYZA**. Heads many-flowered, monoecious; the exterior pistillate and fertile, in many series, with a filiform truncate or 2-3 toothed corolla; a few of the central flowers staminate, sterile, but often styliferous or even fertile, with a tubular 5-toothed corolla. Scales of the involucre in several series. Receptacle flat or convex, punctate or fibrillate. Achenia compressed, attenuate at base, usually glabrous. Pappus a single series of capillary scarcely scabrous bristles.—Chiefly tropical herbs, with branching stems, and variously incised leaves. Heads peduncled, corymbose or paniculate. Flowers yellow.—*T. and G. Fl. N. Am.*

long, the uppermost nearly linear, entire, viscid, more or less resinously punctate; heads clustered, mostly sessile; scales of the involucre ovate, with scarious margins, imbricated in about 3 series; achenia glabrous.—Near Cañon City, *Brandegee*. Near Pueblo, *Greene*.

*PERICOME*¹ *CAUDATA*, Gr., *Pl. Wright.*, 2, p. 82. Herb 3°-4° high, much branched, growing in large bunches; branches terete, striate, sparingly puberulent or smooth; leaves on long petioles, membranaceous, 3-nerved at base, dilated-triangular, or the upper hastate, long-acuminate, often angulate-toothed below the middle, larger ones 3' broad and 4' long including the acumination, which is 1½'-2' in length; heads in terminal cymes or corymbs, on slender pedicels ½' long; involucre not bracteate, 3' long; scales narrowly-linear, 1-nerved, coalescent to near the apex, free tips lanuginous-ciliate; corolla yellow, the slender tube viscos-glandular; achenia 2' long, much compressed, margined all around with a strong, callous nerve, bearded with hispid hairs.—Grand Cañon of the Arkansas, *Brandegee*. Chian Cañon, *Meehan*. *Ute Pass*, *Porter*.

*DIAPERIA*² *PROLIFERA*, Nutt. Annual, erect, woolly; stems stout, rigid, 2'-5' high, terminated by a capitate cluster ½'-¾' in diameter including a large number of small heads; some of the branches when numerous arise from below and overtop this compressed head; leaves spatulate-oblong or linear-spatulate, numerous sessile, entire.—*Hall*.

*MELAMPODIUM*³ *CINEREUM*, D.C. *Prod.*, 5, p. 518. (*M. leucanthum*, T. & G. *Fl. N. Am.* 2, p. 271.) Suffruticose, much branched at the base, 6'-10' high, cinereous-pubescent; leaves very numerous, linear, the lower linear-spatulate, obtuse, entire or obtusely sinuate-repand, about 1' long,

¹*PERICOME*, Gray, in *Pl. Wright.*, 2. Heads many flowered discoid; involucre shorter than the disk, campanulate. Scales in 1 series, about 20, linear, united among themselves by the very narrow hyaline margins. Receptacle flattish, naked. Flowers all hermaphrodite. Coroll astubular; the tube slender, viscos-glandular; throat cylindraceous; teeth 4, ovate, spreading. Anthers exsert, sub-sagittate at base. Branches of the style filiform, slightly flattened, obtusish, minutely hairy on the outside above and at the apex. Achenia linear-oblong, compressed, very smooth on the faces, bearded-ciliate on the nerve-like margins. Pappus squamelle-coroniform, fimbriate-lacinate; the fimbriae similar to the strong hairs of the achenium.—Tall, smooth, branching herbs, with opposite leaves or the uppermost subalternate, triangular or hastate, very long acuminate, slightly resinose-punctate, not glandular. Heads cymose. Flowers yellow.

²*DIAPERIA*, Nutt. Heads fusiform-oblong, disposed in sessile glomerules of 4-5 together, which are collected in large capitate and bracteate compound clusters terminating the stem and simple or mostly proliferous branches; the fertile flowers 8-12, pistillate, in the axils of the chaff of the receptacle, with a much attenuated filiform truncate corolla; the 2-3 central staminate, with a tubular-infundibuliform minutely 4-toothed corolla, destitute of ovaries, each supported by a filiform stipe and inclosed in a chaff of the receptacle. Scales of the involucre and the chaff of the small convex receptacle scarious, oval, broad and large for the size of the head, closely and somewhat distichously imbricated and wrapped around each other, the inner successively longer; the 2-3 innermost chartaceous, attenuate at the base, woolly toward the apex, each convolute and separately inclosing a sterile flower. Style in the sterile flowers undivided; in the fertile with 2-filiform branches. Achenia obovate-oblong, obcompressed, glabrous, destitute of pappus.—*T. & G. Fl. N. Am.*

³*MELAMPODIUM*, L. Heads many-flowered; the ray-flowers 5-10, in a single series; those of the disk sterile by the abortion of the style. Involucre double; the exterior of 3-5 flat and spreading foliaceous scales; the inner as many as the ray-flowers and inclosing their achenia. Receptacle convex or subulate-conical, chaffy; the chaff membranaceous, deciduous. Style in the sterile flowers undivided and hairy above. Achenia of the disk abortive; of the ray obovate, smooth, slightly curved, invested by the inner scales of the involucre, which are often rugose or tuberculate, or enucleate at the summit, and either truncate or produced into 1-3 teeth or awns.—Herbaceous or suffruticose (chiefly Mexican) pinats, with dichotomous stems, opposite sessile leaves, and terminal or alar peduncles bearing a single head. Flowers yellow or white. *T. & G. Fl. N. Am.*

strigose-hispid above, younger ones silky-hirsute beneath; peduncles elongated, bearing single heads; rays 10, oval-oblong, emarginate or 2-3 toothed, white, thrice the length of the ovate and hairy exterior scales of the involucre, the inner inclosing the achenia, tuberculate-scabrous toward the base, dilated above into a short, smooth hood, truncate at the summit with the margin entire and involute.—Purgatory River, *Dr. Bell*. Near Cañon City, *Redfield*.

IVA AXILLARIS, Pursh. Stem 6'-15' high, much branched from a somewhat slender, woody base, very leafy; leaves 9'-15' long, 3'-8' wide, obovate or oblong, obtuse, narrowed at the base, minutely appressed-pubescent, sessile; heads solitary in the axils of the leaves on short, recurved pedicels; scales of the campanulate involucre 4-5, distinct or united to the middle; fertile flowers 4-5; chaff of the receptacle filiform-linear.—*Hall & Harbour*, 261. *Cañon*

IVA CILIATA, Willd.—*Hall & Harbour*, 262.

IVA (*EUPHROSYLE*) *XANTHIFOLIA*, Gr.—*Hall & Harbour*, 263. *Denver*, *Dr. Smith*.

AMBROSIA TRIFIDA, L.—Plains around Denver, *Coulter*.

AMBROSIA PSILOSTACHYA, DC.—On the Platte, near Denver, *Dr. Smith*.

*FRANSERIA*¹ *TOMETOSA*, Gr., *Pl. Fendl.*, p. 80. Herbaceous, pubescent throughout, with a soft, silky, and silvery pubescence; stem erect, about 1° high, paniculate, bearing numerous panicle branches; leaves pinnately 3-5 parted, very white, especially beneath, decurrent into a short, narrowly-margined petiole; lowest apparently bipinnatifid, lobes of the upper ones oblong or lanceolate, dentate or very entire except the large 3-lobed terminal one; sterile involucre 3" in diameter crowded in a dense raceme, 6-toothed, 18-20 flowered, fertile involucre $\frac{1}{2}$ the size, clustered in the upper axils, ovoid, viscous-puberulent, beset with strong, subulate spines somewhat hooked at the apex, two of them thicker and beaked, two-flowered.—*Hall & Harbour*, 264.

FRANSERIA HOOKERIANA, Nutt. Annual, much branched, 1°-2° high; leaves ovate in outline, 1'-1½' long, minutely strigose, bipinnatifid, segments oblong or linear; heads in panicle racemes, fertile ones with several strong, flattened prickles, sterile ones with a 5-8 cleft involucre and 10-20 flowers; chaff of the sterile receptacle small and inconspicuous.—*Hall & Harbour*, 265. Wet Mountain Valley, *Brandegee*. Near Denver, *Dr. Smith*.

FRANSERIA TENUIFOLIA, Gr., *Pl. Fendl.*, p. 80. Stem erect, hispid; branches diffuse, slender; leaves bipinnatisect, strigose, hirsute, somewhat cinereous, pinnae and segments 3-7, linear, entire or 1-2 toothed, sometimes with a few separate lobes on the narrow rachis, terminal lobe very long; raceme spike-form, slender, disposed in a leafy panicle; involucre of the male flowers equaling the pedicel, 7-8 toothed, 6-12 flowered, of the female clustered below, armed with a few very short uncinate spines, 2-celled within, 2-flowered.—Near Pueblo, *Greene*.

FRANSERIA DISCOLOR, Nutt. Stems a span high from a creeping

¹ *FRANSERIA*, Cav. Heads of two sorts, the fertile ones at the base, and the sterile ones composing the upper portion of the racemes or spikes. Fertile heads with an ovoid or oblong closed involucre, composed of numerous united scales, the tips free and spinose or hooked; corolla none or rudimentary; style with filiform, obtuse branches; achenia oblong; pappus none. Sterile heads hemispherical; the 12-20 flowered, cup-shaped involucre of 8-12 united scales; receptacle flattish, with filiform chaff; corolla funnel-shaped, 4-5 toothed, anthers tipped with a slender inflexed appendage; ovary none; style radiate-penicillate at summit.—Herbs or suffruticose plants; the leaves alternate, coarsely toothed or lobed, or even bipinnatifid.

root, with lateral decumbent branches, slightly pubescent; leaves lanceolate in outline, 6' long, interruptedly bipinnatifid, nearly smooth above, closely canescent-tomentose beneath, segments subovate, acute, confluent on the wide rachis; sterile involucres about 5-6 toothed; fertile flowers few; fruit spiny.—Near Denver, *Greene*.

ZINNIA¹ GRANDIFLORA, Nutt. Stems numerous, much-branched from a woody base, 4'-5' high, somewhat hirsute; leaves opposite, linear, connate, with scabrous margins, 1' long, 2"-3" wide; scales of the involucre rounded, closely imbricated; rays yellow, very large, orbicular-oval, $\frac{1}{2}$ " wide; pales fimbriate; achenia of the disk with a single awn.—Cañon City, *Brandegee*. Colorado Springs, *Redfield*. *Pueblo*

HELIOPSIS LEVIS, Pursh.—Near Cañon City, *Brandegee*.

RUDBECKIA LACINIATA, L.—Cañon City, *Brandegee*. B. H. Smith. Sierra Madre Range, *Coulter*. *Empire*

RUDBECKIA HIRTA, L.—On the Platte near Denver and Bear Creek, *Coulter*.

LEPACHYS COLUMNARIS, T. & G. Strigose-scabrous, branched from the base, 1°-2° high; radical leaves usually undivided, spatulate-lanceolate, cauline ones pinnately-parted, the upper sessile, segments linear-lanceolate or oblong, rigid, mucronulate, entire, rarely somewhat lobed; disk columnar, longer than the 5-8 oblong or obovate-oval, recurved, yellow rays; chaff with woolly tips. Disk 1' or more long.—Abundant on the plains around Denver and Colorado Springs. *Hall & Harbour*, 266; *Dr. Smith*; *Brandegee*; *Coulter*.

Variety TAGETES, Gr., *Pl. Wright*, 1, p. 106. Rays deep reddish-brown.—Purgatory River, *Dr. Bell*. *Pueblo*, *Greene*. *Plains*

HELIANTHUS PETIOLARIS, Nutt. *T. & G. Fl. N. Am.* 2, p. 319. Stem erect, 1°-3° high, strigose or hispid, branching; leaves scabrous, alternate, the lower sometimes opposite, ovate-lanceolate or ovate, entire or somewhat repand-toothed, 3-nerved, on very long, slender, scabrous petioles; peduncles terminal, naked, bearing solitary (usually large) heads; scales of the involucre lanceolate, acute or acuminate; disk-flowers pubescent at base; achenia villous; pappus of two chaffy awns. Heads very variable in size.—Near Denver, *Dr. Smith*. Plains near Colorado Springs, *Porter*. Cañon City, *Brandegee*. *Meehan*. Along the Platte, *Coulter*. *Hall & Harbour*, 270; *Parry*, 420.

HELIANTHUS LENTICULARIS, Dougl. Annual, scabrous or hispid, branching, stout, 3°-8° high; leaves ovate, alternate, acuminate, coarsely serrate, 3'-6' long, 2'-4' broad, 3-nerved at the base and suddenly narrowed into a petiole nearly as long as the leaf, uppermost often lanceolate and entire; heads mostly paniced, peduncled 2'-4' broad; scales of the involucre ovate, ciliate, abruptly and conspicuously acuminate, in about 3 rows, spreading; rays 20-40, large; chaff of the flat receptacle nearly as long as the purplish disk-flowers, concave, carinate,

¹ ZINNIA, L. Heads many-flowered; the ray-flowers pistillate, those of the disk tubular, perfect. Involucre imbricate; the scales roundish or oval, margined. Receptacle conical or somewhat cylindrical, covered with oblong conduplicate, chaffy scales which envelope the disk flowers. Rays obovate or oblong, coriaceous, reticulated, persistent, continuous with the summit of the achenium, or rarely somewhat articulated. Lobes of the corolla of the disk densely velvety-villous at the summit with colored hairs. Branches of the style in the disk-flowers terminated by a hairy somewhat capitate cone. Achenia nearly wingless; those of the ray somewhat 3-sided, mostly destitute of pappus; of the disk, compressed or flat, 1-2 awned or toothed, rarely naked.—Annual (American) herbs, with opposite mostly sessile entire leaves. Heads solitary, terminating the branches, showy, persistent. Rays purple, orange, scarlet, or greenish-white. *T. & G. Fl. N. Am.*

tricuspidate, the middle point much the strongest and dark-colored; achenia finely appressed-pubescent; pappus of two lanceolate, chaffy awns.—Plains near Denver and Colorado Springs, *Porter*; *Dr. Smith*. Cañon City, *Brandegee*. Along the Platte, *Coulter*.

HELIANTHUS ORGYALIS, DC. Stem tall, 6^o-10^o high, very smooth; leaves very numerous and narrow, linear, 3'-6' long, 1"-2" wide, flat, the lower remotely denticulate, 1-nerved, slightly if at all scabrous; heads 5-7, corymbose, on long peduncles, rather large; scales of the involucre lax, attenuate-subulate, longer than the disk; rays about 15, 1' or more long; chaff of the receptacle, linear-subeniform, somewhat ciliate at the apex; pappus of 2-4 awns; achenia glabrous.—*Parry*, 57.

HELIANTHUS RIGIDUS, Desf.—*Hall & Harbour*; *Dr. Smith*. Cañon City, *Brandegee*. Platte River, *Coulter*.

HELIANTHUS PUMILUS, Nutt. (?) *Sill. Jour.*, (N. S.) v. 33, p. 10. Stem 1^o-3^o high, hispid, bearing a few heads; leaves opposite, ovate-lanceolate, sub-entire, cinereous-hispid, (when young, covered with resinous atoms,) tripli-nerved next the base, short-petioled, uppermost lanceolate, subsessile, often alternate; involucre a little shorter than the disk, scales oblong, not appendaged, obtusish, white-villous without; flowers of the disk yellow; achenia glabrous, toward the apex sparsely hispid-ciliate; chaff of the pappus subulate, a little shorter than the corolla, with smaller ones interposed on the outside, and margins appressed-hispid.—*Hall & Harbour*, 269.

HELIANTHUS GIGANTEUS, L.—Cañon City, *Brandegee*. Denver, *Dr. Smith*. The form with opposite narrowly lanceolate, and long acuminate leaves, and long, narrow, foliaceous involucreal scales.

HELIANTHELLA¹ UNIFLORA, T. & G. Stem and leaves clothed with a short and soft, somewhat cinereous pubescence, 2^o-3^o high; leaves broadly lanceolate, 4'-6' long, 1'-2' wide, pointed, narrowed at the base, mostly opposite, lower ones petioled, all 3-nerved above the base; heads solitary or with 1-2 from the upper axils, on long peduncles, 2'-4' broad; involucre leafy at base, scales lanceolate, ciliate-hirsute; chaff of the slightly convex receptacle closely conduplicate, delicately scarious, pubescent at the tip; achenia 2-winged, ciliate and pubescent, crowned with 2 long awns and 2-4 intermediate lacinate squamellæ; rays 15-20, pale yellow.—*Hall & Harbour*, 268. Cañon City, *Brandegee*. Near Denver and Horse Shoe Mountain, *Coulter*.

HELIANTHELLA PARRYI, Gr., *Proc. Acad. Phil.*, March, 1863, p. 68. *Note*. Hirsute; stem single from a thickened root; radical leaves narrowly lanceolate, hispidly-ciliate, very acute, 4' long including the petiole, upper cauline ones sublinear, 1'-2' long; heads 2-4, small, somewhat nodding, on short or elongated peduncles; scales of the involucre linear-lanceolate, long-acuminate, inner ones exceeding the disk, hispidly-ciliate; chaff of the receptacle slightly scarious, barbulate on the truncate apex; achenia oblong, awnless, crowned with hyaline squamellæ which are resolved into a villous fringe that equals the proper tube of the corolla in

¹ **HELIANTHELLA**, Torr. & Gr. Heads many-flowered; the ray-flowers 10-24, neutral; those of the disk perfect. Scales of the involucre linear or lanceolate, in about 2 series, loose, somewhat foliaceous. Chaff of the receptacle persistent, embracing the achenia. Corolla of the disk cylindrical, elongated, 5-toothed, with a very short proper tube. Branches of the style very hispid, more or less obtuse. Ovary compressed, with one or both margins slightly winged and produced at the summit into a short serrulate and lacinate persistent appendage or into an awn, sometimes with intermediate squamellæ, or an obscure coroniform fringe, glabrous, or ciliate.—Perennial herbs, with linear or lanceolate mostly scattered and sessile entire leaves, and solitary showy heads terminating the stem or branches. *T. & G. Fl. N. Am.*

length; involucre 6" long; disk 6" broad; ligules 7"-9" long.—*Canby*. Ute Pass, *Porter*. South Park, *Coulter*. Central City, *Greene*.

HELIOMERIS¹ MULTIFLORA, Nutt. *Jour. Acad. Phil.*, (N. S.), 1, p. 171. Stems few from a woody root, 1°-2° high, simple or corymbosely branched above; leaves narrowly lanceolate, 1'-2½' long, 3"-6" broad, more or less scabrous pubescent, entire or obscurely serrate; heads 6"-8" broad, excluding the rays, mostly terminal on long branches; chaff of the receptacle rather rigid, pungently acute, villose; rays 10-12, oblong-oval, entire or slightly emarginate; achenia compressed-pyriform, scarcely angled, black and somewhat shining.—*Hall & Harbour*, 271. Near Denver, *Dr. Smith*. Among the mountains, *Canby*. Cañon City, *Brandegee*. Mount of the Holy Cross and Sierra Madre Range, *Coulter*.

Var. **LATIFOLIA**, *Porter*. Taller, 3° high; leaves larger, 3'-4' long, 1'-1½' broad, usually serrulate with scattered teeth.—Foot-hills near Colorado Springs, *Porter*.

THELESPERMA² FILIFOLIUM, Gr. Annual, glabrous, 1°-2° high, much branched, branches slender; leaves opposite, 1-2 pinnately parted or divided, the upper 3-5 divided or simple, nearly sessile, divisions attenuate-filiform, scales of the interior involucre with broad scarious margins united nearly to the middle, longer than the linear-subulate, exterior scales; rays obovate, 3-toothed; achenia 3" long, crowned with two triangular-subulate, concave, at length divaricate short awns or teeth which are fringed with yellow, reflexed, bristly hairs; heads numerous, small, 6" broad without the rays.—*Hall & Harbour*, 280. Cañon City, *Brandegee*. Near Denver, *Dr. Smith*. Plains around Colorado Springs, *Porter*. Monument Park, *Coulter*; *Redfield*.

THELESPERMA GRACILE, Gr. Erect, 2°-3° high, branched above; branches strict, elongated, corymbosely; leaves pinnately or pedately about 5-parted, with narrowly-linear, rigid lobes, the uppermost nearly simple; heads few many, on long peduncles; involucre campanulate, inner scales united above the middle, obtuse or acutish, often with narrow, scarious margins, exterior ovate, very short, obtuse; rays none; achenia oblong-linear, crowned with 2 stout subulate, persistent, spreading, retrorsely pectinate-hispid awns.—*Hall & Harbour*, 279. Plains around Denver and Colorado Springs, *Porter*.

COREPOSI TINCTORIA, Nutt.—On the plains. *Hall*.

COREPOSI INVOLUCRATA, Nutt. "Minutely pubescent, stem quadrangular below; leaves 1-2 pinnately 3-7 parted, the divisions linear-

¹**HELIOMERIS**, Nutt. Heads many-flowered, radiate; rays neutral; disk-flowers numerous, perfect, the corolla with a very short pubescent proper tube, (i. e. amplified very near the base,) 5-toothed. Involucre spreading; oblong-linear scales in about 2 rows. Receptacle oblong-conical, covered with persistent lanceolate, concave-carinate chaff, partly embracing the disk-flowers and nearly their length. Stamens with broad ovate appendages and blackish anthers. Branches of the style oblong-clavate, slightly hispid. Achenia cuneate-oblong, compressed-quadrangular, entirely destitute of pappus.—Perennial Western North American herbs or suffruticose plants, with nearly entire, mostly opposite leaves and yellow flowers, smaller than those of most *Helianthi*.

²**THELESPERMA**, Gray. (*Cosmidium*, T. & G., *Fl. N. Am.*) Heads many-flowered; the ray-flowers about 8, neutral, or sometimes wanting; those of the disk tubular, perfect. Involucres double, each of 8 scales; the interior oblong-ovate, somewhat membranaceous, united to the middle, much larger than the exterior. Receptacle flat; the chaff scarious, oblong, obtuse, with 2 approximate colored nerves, shorter than the flowers, partly investing the achenia, and deciduous with them. Corolla of the disk with a very slender tube and a deeply 5-cleft limb; the segments long and linear, recurved, Achenia linear-oblong (obscurely-angled when young,) terete or slightly obcompressed, a little incurved and tuberculate on the back when mature, not rostrate, the abrupt summit crowned with 2 dentiform retrorsely pectinate-ciliate (persistent?) awns.

lanceolate, incisely toothed; heads paniculate; scales of the exterior involucre about 20, linear-lanceolate, hirsute (as well as the peduncles) longer than the interior; achenium oval, hispid-ciliate, 2-toothed at the summit.—*Parry*, 31. Plains.

BIDENS FRONDOSA, L.—Cañon City, *Brandegee*. Introduced.

BIDENS CHRYSANTHEMOIDES, Mx.—Plains near Denver, *Dr. Smith*.

BIDENS BIPINNATA, L.—Ute Pass, *Porter*. Introduced.

BIDENS TENUISECTA, Gr., *Pl. Fendl.*, 86. Annual, nearly glabrous; stem 1°-2° high, very smooth, terete, branching, ascending; branches striate-angled, with 1-3 heads at the naked summits; leaves opposite or alternate, bipinnately-parted or biternately-divided, segments linear, very entire or 2-3 lobed, a little broader than the rachis; scales of the hirsute involucre linear; rays 5-8, inconspicuous, scarcely equaling the disk; achenia attenuate linear, glabrous, somewhat 4-angled, striate, awns 2, short.—Huerfano County, *Greene*.

*XIMENESIA*¹ *ENCELIOIDES*, Cav. Annual, cinereous-pubescent; stems stout, striate, 3°-5° high; branched above; leaves opposite or alternate, ovate, coarsely dentate-serrate, tapering into a long, winged petiole, tripli-nerved, paler beneath; heads corymbose on long, naked peduncles; achenia of the disk slightly villous, surrounded by a broad wing, emarginate at the summit of the deeply 3-toothed, yellow ray, rugose and wingless.—Abundant around Cañon City, *Brandegee*. *Very officinal* 51

DYSODIA CHRYSANTHEMOIDES, Lag.—Plains around Denver and Colorado Springs, *Porter*.

*GAILLARDIA*² *ARISTATA*, Pursh. Perennial, villous-pubescent or almost tomentose with jointed hairs; stem simple or branched, 1°-2° high; leaves alternate, minutely punctate, radical and lower ones lanceolate, tapering into slender petioles, sinuate-pinnatifid or coarsely toothed, minutely serrate or nearly entire, the uppermost linear or oblong-lanceolate; sessile, usually dilated at the base, and partly clasping; heads large, 1½'-2½' in diameter including the rays; involucre hirsute; corollas of the disk with short, broadly subulate teeth, of a rich brownish-purple or maroon color; rays 10-18, crowded, elongated-cuneiform, deep yellow; chaff of the pappus 6-8, broadly lanceolate; funbrille of the receptacle few, aristiform, slender, distinct, not dilated at the base, 2-3 times the length of the nearly smooth achenia.—*Hall & Harbour*. Near Denver, *B. H. Smith*. Pleasant and Monument Parks, *Coulter*. Sangre de Cristo Range, *Redfield*.

GAILLARDIA PINNATIFIDA, Torr. *Ann. N. Y. Lyc.* 2, p. 214. Peren-

¹*XIMENESIA*, Cav. Heads many-flowered; the rays ligulate, in a single series. Scales of the involucre somewhat in 2 series, narrow, acute, foliaceous, spreading. Receptacle convex; the chaff lanceolate, membranaceous, embracing the flowers. Tube of the corolla hispid. Branches of the style in the disk-flowers appendiculate. Achenia of the disk flat (compressed laterally,) winged, somewhat hairy, deeply emarginate at the summit, with 2 setiform awns more or less united with the wing; those of the ray mostly dissimilar and wingless. *T. & G. Fl. N. Am.*

²*GAILLARDIA*, Foug. Heads many-flowered, radiate; the ray-flowers neutral, in a single series, deciduous. Scales of the involucre in about 3 series, very acute, foliaceous, more or less callous and appressed or erect at the base, above spreading or at length reflexed; the exterior largest. Receptacle convex or hemispherical, funbrillate (the funbrille rigid or coriaceous and elongated,) or in one species nearly naked. Rays cuneiform, palmately 3-cleft or toothed at the summit. Corolla of the disk with a short tube, and an elongated cylindrical somewhat inflated 5-toothed limb; the teeth usually subulate, and hispid with jointed hairs. Branches of the style terminated with a very long and acute filiform hispid appendage. Achenia obpyramidal, involucre with villous hairs. Pappus of 6-10 membranous 1-nerved scales, the nerves produced into awns about the length of the corolla. *T. & G. Fl. N. Am.*

nial; canescent; stems 8'-12' high, branching; leaves sessile, pinnatifid, the rachis and remote lobes linear; heads rather small; involucre in about 2 series, nearly equal to the disk; rays deeply 3-cleft; chaff of the pappus lanceolate; fimbriae of the receptacle aristaform, slender, sparse, longer than the achenia.—Purgatory River, *Dr. Bell*.

GAILLARDIA PULCHELLA, Foug. Annual, puberulent, or slightly hirsute, branching; leaves lanceolate, the lower ones tapering at the base and slightly petioled, somewhat toothed or rarely incised, the upper entire, partly clasping, apiculate-acuminate; involucre very hirsute and callous at the base, longer than the disk; heads 1' or more in diameter; rays 10-12, attenuate at the base, deeply 3-cleft, violet-purple, the teeth yellow; corolla of the disk with attenuate, subulate teeth; chaff of the pappus ovate, or lanceolate-oblong, with long awns; fimbriae of the receptacle aristaform-subulate, not dilated at the base, slender, longer than the achenia; achenia involucre with a villous-ferruginous tuft.—Plains of Eastern Colorado, *Dr. Bell*.

PALAPOXIA¹ HOOKERIANA, T. & G., (*P. Texana*, Hook.) Plant 1^o-2^o high, strigose-scabrous; branches paniculate or corymbose; leaves lanceolate, 1-3 nerved; heads 9" long, many-flowered, radiate; scales of the involucre 12 or more, very glandular as well as the peduncles and branches, imbricated in 2 series, exterior lanceolate, interior obovate-lanceolate or oblong; rays 8-10, more or less exerted, purple, broadly cuneiform, deeply 3 cleft; limb of the disk corolla 5-cleft below the middle; pappus of the disk-flowers of 6-8 narrowly-lanceolate, acuminate scales as long as the attenuated, hairy achenium, in the rays of as many obovate-spatulate, very obtuse, rigid scales, many times shorter than the nearly glabrous achenia.—*Hall & Harbour*, 352.

CHLENACTIS² DOUGLASSII, Hook. & Arn. (*C. achilleifolia*, H. & A.) "Biennial and sometimes annual, whitened with a close tomentum, or rarely smoothish; stems 2^o-3^o high, simple or much branched, often several from one root; leaves somewhat fleshy, 1'-3' long, ovate, oblong in outline, 2-3 pinnatifid with very numerous and often crowded, minute oblong or obovate, rounded lobes; heads few-many, corymbed; involucre turbinate or campanulate, the oblong-linear scales in 1-2 series; flowers 6'-7" long, whitish or flesh-colored; corollas pubescent, marginal ones scarcely larger; achenia linear, hispid, blackish, as long as the corolla; pappus of about 10 unequal and oblong or lanceolate, crossely-denticulate scales, $\frac{1}{2}$ - $\frac{3}{4}$ as long as the

¹**PALAPOXIA**, Lagasca. Heads 10-30 flowered; the flowers all perfect and tubular, or the exterior series either imperfectly or manifestly radiate; the rays 3-cleft, pistillate, scales of the obconical or campanulate involucre 8-15, membranous or herbaceous with scarios tips, appressed (or spreading in fruit,) in 1-2 series, shorter than the disk. Receptacle small, flat, naked or slightly alveolate. Corolla of the disk with a slender tube and an expanded deeply 5-cleft or 5-parted limb; the lobes linear or lanceolate, spreading, glabrous. Branches of the style long and filiform, flatish, glandular-pubescent throughout. Achenia quadrangular, slender, tapering to the base, minutely pubescent. Pappus of 6-12 membranaceous, denticulate, pinnately striate scales, furnished with a strong midnerve, which is thickened at the base and often somewhat produced at the apex; the pappus of the exterior flowers often much shorter. *T. & G. Fl. N. Am.*

²**CHLENACTIS**, DC. Heads many-flowered; flowers all tubular and perfect; the corollas glabrous or puberulent, elongated, narrowly obconic or campanulate above and trumpet-shaped, 5-toothed; the outer ones (rays) more expanded than the rest and often somewhat irregularly ventricose, 5-cleft; teeth or lobes pubescent. Involucre campanulate; the scales oblong-linear, about 20, in 1-2 rows. Receptacle alveolate. Style with very long, narrowly-linear branches, the upper part hispid. Achenia linear, tapering to the base, striate or quadrangular. Pappus of 4-12 hyaline, membranous, usually nerveless scales, with crossely-denticulate margins, those of the disk flowers usually much shorter.

achenium." We have adopted for this variable species the excellent emended description of Prof. Eaton in *King's Report*, vol. 5, p. 172.—*Hall & Harbour*, 283; *Parry*; *Cauby*. Upper Arkansas, *Porter*. Sangre de Cristo Pass and Sierra Mojado, *Braudegee*. Twin Lakes, Mount La Plata, and Sierra Madre Range, *Coulter*.

HYMENOPAPPUS TENUIFOLIUS, Pursh. Whitened-tomentose, often becoming smoothish; stems 8'-15' high, leafy at base, sparingly corymbose toward the summit, sometimes several from a rather stout, simple or branched, perennial caudex; radical leaves petioled, 2'-4' long, 2-3 pinnately divided, divisions very narrowly linear, cauline ones sessile, similar but smaller or reduced above the linear bracts; heads pedunculate, 4"-6" wide, hemispherical-campanulate; scales of the involucre 6-8, oval, appressed, with broad, obscurely-denticulated, scarios margins; corolla-tube very short, throat abruptly inflated; pappus of spatulate-oblong, obtuse, slightly-erose scales, nerved to the middle, mostly as long as the tube of the corolla.—*Hall & Harbour*, 283. Upper Arkansas, *Porter*. Cañon City, *Braudegee*. Plains of the Platte, *Coulter*. Wet Mountain Valley, *Redfield*.

*BAHIA*¹ *OPPOSITIFOLIA*, T. & G. Perennial, canescently pubescent, very much branched from the base upward, 4'-8' high; branches opposite, more or less spreading or decumbent; leaves opposite, petioled, 1-2 palmately divided, segments linear or lance-linear, about 1' long; peduncles slender; involucre campanulate; scales 5-8, oblong-ovate; rays about the same number, very short; pappus minute, scales 5-8, partly obtuse, somewhat lacerate; achenium fusiform, tapering to the base, sparingly scabrous.—*Hall & Harbour*, 278. Around Denver, *Dr. Smith*. Colorado Springs, *Porter*. Cañon City, *Braudegee*; *Cauby*.

*VILLANOVA*² *CHRYSANTHEMOIDES*, Gr. *Pl. Wright*, 2, p. 96. Puberulent; stems erect, 1°-4° high, corymbosely paniculate above; flowering branches and peduncles viscid-glandular; leaves alternate, 1-2 ternately parted, segments 2-3 lobed or pinnatifid, lobes oblong or sub-linear, obtuse; heads 6" in diameter exclusive of the ligules which are 5" long; flowers all yellow; scales of the involucre 16-20, in about 3 series, equal, acuminate, herbaceous; ligules 16-20, oval-oblong; flowers of the disk many, tubes glandular; receptacle rather convex; achenia quadrangular, sub-clavate, nearly glabrous, striate, all fertile.—*Hall & Harbour*, 281. Cañon City, *Braudegee*. Soda Springs, *Porter*. Twin Lakes, *Coulter*.

ACTINELLA ACAULIS, *Dr.* Cespitose, dwarf and acaulescent, villous pubescent or silky; caudex perennial, simple or branching; leaves all radical, spatulate or linear-obovate, entire, 1'-2½' long; scapes 1'-6' high, usually leafless and bearing a single head, 9"-15" broad; involucre of 2 rows of oval or oblong scales, equaling the disk; rays 10-12, broadly cuneate, 3-toothed and often sprinkled with resinous atoms; pappus of

¹ *BAHIA*, Lagasca. Heads many-flowered, radiate; rays 5-30, pistillate, fertile; disk-flowers tubular, perfect, fertile; corollas glandular-hairy, 5-toothed. Involucre sub-globose or campanulate; the scales appressed, in one or two rows. Receptacle convex and obtuse, or truncate, or with a conical fleshy appendage. Achenia narrowly turbinate or linear, 4-sided. Pappus a crown of short scarios nerveless or rarely 1-nerved and even awned scales.

² *VILLANOVA*, Lagasca, *DC. Prod.* 6, p. 75. Heads few-flowered, heterogamona. Ray-florets 5-10, pistillate, ligulate, obovate, toothed at the apex. Flowers of the disk perfect, fertile, tubular, terete, 5-toothed. Scales of the campanulate involucre few, in 1 series. Receptacle flat, naked. Branches of the style in the disk-flowers capitate, blunt. Achenia obpyramidal, wingless, punctate, glabrous. Disk epigynous, minute. Pappus none.

5-7 broadly ovate scales, tipped with slender awns. Alpine.—*Hall & Harbour*, 276. Wet Mountain Valley, *Brandegee*. Mount Lincoln, at 14,000 feet altitude, and Horse Shoe Mountain, *Coulter*. South Park, *Canby*. *Meehan*.

ACTINELLA SCAPOSA, Nutt. Villous; scapes single from a woody caudex, 6'-9' high, leafless, bearing a single head; leaves radical, linear-spatulate, acute or obtusish, 2'-3' long, 2''-3'' wide, becoming smooth and shining, conspicuously punctate, entire; heads 1' wide, including the rays; scales of the involucre ovate, appressed, rather shorter than the disk, in about 3 series, densely villous; rays about 12, 3''-4'' long, cuneate-obovate, bright yellow, 4-nerved and 3-toothed; scales of the pappus 5, short awned, oval.—*Hall & Harbour*, 275. Monument Park, *Porter*. Garden of the Gods, *Coulter*. *Meehan*

ACTINELLA RICHARDSONII, Nutt. Puberulent; stems 3'-6' high from a perennial, somewhat branching, woody caudex; leaves petioled, rigid, 3'-6' long, pinnately or irregularly 3-7 parted toward the summit, divisions narrowly linear; heads loosely corymbose, 9''-12'' broad, including the rays; involucre shorter than the disk; scales in 2 rows, oblong or ovate, the exterior united at the base; pappus of 5-7 ovate-lanceolate, cuspidate-awned scales; caudex and bases of the lower leaves woolly tomentose.—*Hall & Harbour*, 274. Abundant at middle elevations, South Park and Ute Pass, *Porter*. Wilson Creek, Fremont County, *Brandegee*. *Canby*. Twin Lakes and Weston's Pass, *Coulter*. *Redfield*.

ACTINELLA GRANDIFLORA, T. & G. Perennial, more or less densely clothed with soft, white wool; stems erect from a woody caudex, stout, striate, 6'-9' high, leafy, simple or with 2-3 branches from the base or middle of the stem; lower leaves pinnately or bipinnately parted, with margined petioles from broad scarious bases, 2'-2½' long, including the petiole, divisions linear; upper cauline leaves simple or sparingly divided; heads very large, 2'-3' broad, including the bright yellow rays; involucre very densely woolly with copious white wool; scales of the involucre in about 2 series, lanceolate, acuminate, exceeding the disk; ligules oblong, 6''-12'' in length, 2-3-cleft at the truncate apex; scales of the pappus 6-8, narrowly subulate, exceeding the tube of the corolla; achenia villous-hispid. A very showy, high-alpine plant.—*Hall & Harbour*, 273. *Parry*; *Meehan*. Mount Lincoln, at 14,000 feet altitude, Gray's Peak, at 12,000 feet, and White House Mountain, at 13,000 feet, *Coulter*.

✓ *VAR GLABRATA*, *Porter*. Softly tomentose, becoming glabrate; stems simple from a woody caudex, 6'-8' high, unbranched, naked above, bearing a single head; lower leaves spatulate-linear, simple or 3-7-parted at the summit, with long, flat, margined petioles from somewhat expanded, scarious bases, 2'-3' long, including the petiole, divisions linear; upper leaves linear, entire; heads 1¼'-1½' broad including the rays; scales of the involucre ovate, rather obtuse, in about 2 series, woolly, but not conspicuously so, much shorter than the disk; ligules about 6'' long, rather narrow, yellow, 2-3-cleft at the apex; scales of the pappus 5, subulate, acuminate, sharply serrate on the margins, much shorter than the corolla of the disk, lead-colored; achenia villose. Alpine.—Sangre de Cristo Pass, *Brandegee*.

HELENIUM AUTUMNALE, L.—Platte near Denver, *Dr. Smith*. Wet Mountain Valley, *Brandegee*.

HELENIUM HOOPESII, Gr. *Proc. Acad. Phil.*, March, 1863, p. 65. *Note*. Stem stout, somewhat tomentose above, striate-angled, 2'-4' high; leaves pale glaucous, thickish, punctate, smooth or slightly pubescent.

entire; radical ones lanceolate-spatulate, narrowed into a short-winged petiole, often very large, 6'-11' long; cauline ones oblong-lanceolate, semi-amplexicaul; peduncles thickened above; heads on long peduncles, naked above, 3-6, very large, 2'-3' broad; scales of the involucre lanceolate or linear, whitish-tomentose; receptacle subglobose; rays 15-20, linear, cuneate, about 1' long, orange-yellow; pappus of lanceolate, subulate, obscurely-nerved scales, a little shorter than the corolla of the disk, as long as the silky-villous achenium. A very showy plant.—*Hoopes*. Wet Mountain Valley, *Brandegee*. Sierra Madre Range, *Coulter*.

ACHILLEA MILLEFOLIUM, L.—Very common throughout Colorado, *Dr. Smith*; *Porter*; *Coulter*; *Brandegee*; *Canby*; *Meehan*.

*LEUCAMPYX*¹ *NEWBERRYI*, Gray.—Herbaceous, at first woolly, at length nearly glabrous; stems stout, 1^o-2^o high, corymbosely branched; leaves 2-3 pinnately parted, segments short, linear, revolute on the margins, radical ones lanceolate in outline, 4'-6' long including the petioles; heads many, rather large, long-peduncled; scales of the involucre obovate, obtuse, with broad scarious tips; corolla of the disk yellow, of the ray white or cream-colored with a spreading cuneate limb 6' long; achenia glabrous, angled, black.—This only species of the genus, which in habit resembles a *Hymenopappus*, was first collected in 1867, by Dr. Newberry in New Mexico, and later in 1872, by Prof. Porter, at the Soda Springs, 35 miles N. W. of Cañon City.

ARTEMISIA DRACUNCULOIDES, Pursh.—*Hall & Harbour*, 302. Cañon City, *Brandegee*. *Hoopes*. Sierra Madre Range, *Coulter*.

ARTEMISIA BOREALIS, Pall.—*Parry*.

ARTEMISIA CANADENSIS, Mx.—*Hall & Harbour*, 300; *Canby*; *Dr. Smith*; *Porter*; *Hoopes*.

ARTEMISIA FILIFOLIA, Torr. Stems 1^o-3^o high, with slender, virgate, papilled branches; leaves 1'-2' long, whitish-tomentose, becoming smooth, filiform with revolute edges, lower ones mostly 3-parted; heads very small, crowded in virgate, leafy panicles, tomentose, 3-5 flowered; two florets, pistillate and fertile, with short truncate corollas, the rest perfect but sterile; corollas funnel-form, 5-toothed. *Hall & Harbour*, 307. Near Denver, *Dr. Smith*.

ARTEMISIA TRIDENTATA, Pursh. Shrubby, 1^o-6^o high, much branched, densely silvery-caulescent; leaves crowded, cuneiform, 6'-12" long, usually 3-toothed at the apex, teeth short and obtuse, those of the flowering branchlets often linear and entire; heads obovoid, 5-6 flowered; outer scales of the involucre tomentose, very short, inner ones scarious; flowers all perfect and fertile; corollas funnel-form, 5-toothed, the proper tube very short; styles 2-cleft, the branches widened somewhat upward, truncate and somewhat penicillate.—On the Blue River, west of the Rocky Mountain Range. *Hall & Harbour*, 306. *Canby*. *B. H. Smith*. On the Arkansas, *Porter*; *Coulter*.

¹ *LEUCAMPYX*, A. Gray (in Benth. & Hook. *Gen. Pl.* 2, p. 422.) Heads heterogamous, radiate; flowers of the ray in one series, pistillate; those of the disk perfect; both fertile. Involucre broadly hemispherical; bracts in 2-3 series, imbricated, broadly scarious at the apex. Receptacle somewhat convex, covered with broad membranaceous-hyaline, chaffy scales half inclosing the achenia. Corollas of the ray pistillate; tube slender; limb broad, 3-toothed or 3-cleft at the apex; those of the disk perfect, regular, tubular; limb campanulate, 5-cleft at the apex. Anthers obtuse at base, entire. Branches of the style in the perfect flowers with short penicillate appendages. Achenia cuneate, incurved, dorsally compressed, subtriquetrous, attenuate at base, obtuse at the apex. Pappus none.

ARTEMISIA LUDOVICIANA, Nutt.—Plains around Denver, *Coulter*.

Var. LATILOBA, Nutt. Lower leaves dilated, deeply pinnatifid or the upper trifid, the lobes and the upper leaves broadly lanceolate, the upper surface less tomentose or becoming smooth.—Near Denver, *Dr. Smith*. Glen Eyrie, *Porter*.

Var. GNAPHALODES, T. & G. Very tomentose-caescent throughout; leaves entire or sharply and irregularly serrate towards the apex.—Near Denver, *Dr. Smith*; *B. H. Smith*.

Var. MEXICANA, Gr. Lower leaves pinnatifid, upper ones trifid; lobes linear or linear-lanceolate, with revolute margins; heads small, tomentose-caescent.—Huerfano County, *Greene*.

ARTEMISIA DISCOLOR, Pall. Suffruticose, erect or ascending, 1⁰-2⁰ high, glabrous, simple below; leaves 1'-3' long, mostly smooth above, paler and tomentose beneath, pinnately-lobed with lanceolate, pointed, entire or sparingly toothed segments, with revolute margins; heads subglobose, 1½''-2'' broad, disposed in an elongated, virgate raceme, or strict panicle; involucre at first tomentose, cup-shaped, the outer scales ovate, inner ones oval, with hyaline, ciliate-fringed margins; receptacle smooth; florets numerous, a few of the outer ones pistillate, fertile, with very slender corollas and smooth branches of the style, the rest perfect, fertile, with funnel-form corollas and truncate, penicillate styles.—Sierra Madre Range, *Coulter*.

ARTEMISIA FRIGIDA, Willd.—*Hall & Harbour*, 304; *Parry*; *Dr. Smith*; *B. H. Smith*; *Porter*; *Meehan*; *Brandege*; *Coulter*.

ARTEMISIA ARCTICA, Less. Herbaceous, tomentose-pubescent or nearly glabrous; stems 8'-15' high, simple, erect, leafy, terminating in a virgate raceme or sparingly-branched panicle, somewhat angled; lower leaves bipinnatifid, on long petioles, lobes linear or linear-lanceolate, incisely toothed; heads large, globose, nodding, sessile or on short slender petioles; scales of the involucre ovate, with blackish scarious margins.—*Hall & Harbour*, 298; *Parry*; *Dr. Smith*; *Brandege*; *Meehan*; *Coulter*. Alpine.

ARTEMISIA SCOPULORUM, Gr., *Proc. Acad. Phil.*, March, 1863, p. 66. Note. Caespitose; rhizoma creeping; stems very simple, 3'-8' high; leaves white-silky, numerous, pinnately 3-5 cleft, segments especially of the radical ones 3-parted, lobes as well as the uppermost leaves linear, narrow; heads many or few, simply racemose-spicate, short-pedicelled, erect, 2''-3'' broad; involucre hemispherical, scales oval, villose on the back, margin broad, scarious, dark-brown; wool of the receptacle copious, as long as the florets; florets 18-30. Alpine.—Weston's Pass and White House Mountain, *Coulter*. Summit of Pike's Peak, *Casby*.

Var. MONOCEPHALA, Gr. l. c. Stem 2'-6' high, terminated by a solitary, larger head; radical and lower leaves simply 3-parted or occasionally 5-parted; uppermost ones linear, very entire; flowers 30 or more, tipped with purplish.—Summit of Pike's Peak, *Casby*.

ARTEMISIA PARRYI, Gr. *Proc. Am. Acad.*, vol. 7, p. 361. Very smooth; stem simple, a span or more high, from a perennial root, leafy; leaves 2-3 pinnately parted; pinnae 5-9, crowded, segments linear, acute, 3''-5'' long; panicle racemose, many-headed; heads nodding, nearly 3'' in diameter; scales of the involucre ovate, very obtuse, with scarious, dark-brown margins; marginal flowers pistillate, few, the others fertile; corollas very smooth.—Sangre de Cristo Pass, *Parry*, 1867.

GNAPHALIUM LUTEO-ALBUM, L., var. SPRENGELII, D. C. Eaton, in *King's Rep.*, v. 5, p. 184. (*G. Sprengelii*, *H. & A.*) Annual, whitened with loose wool; stem 6'-30' high, simple below, corymbose with long

branches toward the summit (sometimes unbranched); leaves slightly decurrent; lower ones 2'-3' long, linear-spatulate, obtuse; upper ones linear-lanceolate, acute; heads clustered; involucre scales shining, yellowish-white, scarious, oblong-ovate, rather obtuse; pistillate florets very numerous, in several rows outside of the perfect ones; achenia one-half larger and smoother than in the European plant.—*Brandegee*. Near Denver, *Dr. Smith*; *H. B. Smith*. Wet Mountain Valley, *Redfield*.

GNAPHALIUM STRICTUM, Gr. *Pac. R. R.*, v. 4, p. 110. Annual, white-woolly; stem simple, or branched from the base, strict, 3'-9' high, virgate; leaves narrowly linear, elongated, uniform throughout, 1'-1½' long, rather crowded; heads closely glomerated in the axils, leafy-bracted; involucre campanulate, outer scales lanceolate, brownish, inner ones linear, white at the apex; receptacle broad and flat; achenia smooth.—*Hall & Harbour*, 311. Wet places in the mountains.

GNAPHALIUM DECURRENS, Ives. "Subalpine; rare."—*Hall & Harbour*, 312. *Hoopes*.

ANTENNARIA CARPATHICA, R. Br., var. *PULCHERRIMA*, Hook. Whole plant covered with a soft silvery tomentum, becoming somewhat glabrate with age; stems simple, leafy, 9'-15' high, sterile ones not stoloniferous; radical leaves narrowly oblanceolate, 3'-4' long, acute, 3-5 nerved, upper leaves gradually smaller; corymb more or less spreading; involucre woolly at the base, scales brownish, tips white, not crisped.—*Canby*. South Park, *Porter*. Cañon City, *Brandegee*. Plains of the Platte and Long's Peak, *Coulter*.

ANTENNARIA ALPINA, Gært. Cespitose, producing stoloniferous, flowerless stems; flowering stems 2'-8' high, simple; leaves 6"-9" long, white-tomentose, the radical ones spatulate, the cauline linear; heads 3-7, nearly sessile in capitate clusters; involucre somewhat woolly at the base; scales olivaceous with paler and crossely-denticulate, narrowed tips, rather obtuse in the sterile heads, but acute in the fertile; pappus of the sterile flowers strongly clavate.—*Hall & Harbour*, 310; *Parry*. Clear Creek, Cañon and Twin Lakes, *Coulter*.

ANTENNARIA DIOICA, Gært. Sterile stems stoloniferous, 6'-10' high, leafy; leaves silvery-tomentose, canescent on the lower or on both sides; the radical spatulate, 1-nerved or 3-nerved at base, the cauline lanceolate or linear, appressed; heads usually many in the capitate or open corymbs; scales of the involucre with loose-denticulate, mostly obtuse tips, white, ochroleucous, rose-color or purple; achenia perfectly smooth.—*Parry*; *Canby*; *B. H. Smith*; *Porter*; *Brandegee*; *Coulter*. Common at middle elevations.

ARNICA ANGUSTIFOLIA, Vahl. More or less villous; stems 4'-10' high, bearing a single head; leaves lanceolate, acute or obtuse, entire or sparingly denticulate, 3-nerved; the radical and lowest tapering into winged petioles, cauline 1-3 pairs, sessile; involucre villous-hirsute; achenia hirsute.—*Hall & Harbour*, 334; *Parry*. Cañon City, *Brandegee*. Long's Peak, Monument Park, Horse Shoe Mountain, and Sierra Madre Range, *Coulter*. "A variable species, from the low and middle to the alpine region; flowering early and late."

VAR. *ERADIATA*, Gr. *Proc. Am. Acad.*, March, 1863, p. 68. Heads discoid; leaves broader; scales of the involucre longer and narrower; usually taller and larger in every way, often 20" high; ripe achenia in our specimens hirsute.—*Hall & Harbour*, 338. *Parry*, 10. Gothic Mountain, *Coulter*.

ARNICA CHAMISSONIS, Less. Hirsute-pubescent or somewhat woolly;

stems simple or branched above, 1°-1½° high, bearing 3 or more heads, leafy to the summit; leaves oblong-lanceolate, acute or obtuse, entire or sparingly denticulate, 3-5-nerved, radical and lower cauline ones narrowed into short petioles, the rest (2-6 pairs) sessile; rays short; involucre finely villous-pubescent; achenia minutely hirsute.—*Hall & Harbour*, 337. South Park.

ARNICA MOLLIS, Hook. Readily distinguished by its almost plumose pappus. "Alpine and sub-alpine."—*Hall & Harbour*, 335; *Dr. Smith*. Sierra Madre Range, at 11,000 feet altitude, *Coulter*.

ARNICA LATIFOLIA, Bong. Sparingly hirsute-pubescent or nearly glabrous; stems 1° high, from a slender, creeping caudex; leaves thin and flaccid, ovate or oblong-ovate, acute, unequally and often very sharply serrate, veiny; the radical ones on long, slender petioles, cauline in about 3 pairs, closely sessile by a cordate base or the lowermost somewhat petioled; heads solitary or 1-2 additional from the uppermost axils, rather small; involucre obconic; scales lanceolate; acuminate; somewhat hairy towards the base; ligules narrow; achenia nearly smooth.—*Parry*, 408. White House Mountain, at 12,000 feet altitude, *Coulter*.

ARNICA CORDIFOLIA, Hook. Woolly-pubescent, becoming glabrate with age; caudex slender, creeping; stems 6'-14' high; leaves thinish, radical and lower ones cordate, roundish, obtuse or acute, on long slender petioles, denticulate or sharply toothed, the cauline 1-3 pairs, on shorter petioles, less deeply cordate and more acute, the highest pair sessile; heads rather large, 1-3, on long peduncles; involucre villous-pubescent; scales lanceolate, often somewhat abruptly acuminate; achenia hirsute.—*Hall & Harbour*, 336. Common; alpine and sub-alpine; very variable in size. Gray's Peak, *Dr. Smith*. South Park, *Canby*. *Meehan*. Sierra Madre Range, Mount Lincoln, at 13,000 feet altitude, Twin Lakes and Clear Creek Cañon, *Coulter*.

SENECIO LUGENS, Richards. Perennial, white-tomentose, deciduously lanate or nearly smooth; stem 6'-2° high, often several from one root; leaves glandular-toothed or denticulate, sometimes entire, obscurely veined, 2'-8' long, 6'-2' wide, the radical obovate or oblong-spatulate obtuse, narrowed into a petiole, cauline sessile and partly clasping, lanceolate; corymb open or dense; heads variable in size, usually rather large; involucre with a few bractlets at the base; scales linear-lanceolate, acute, with blackish-purple tips; rays from 10-12, oblong-linear; twice as long as the involucre; achenia glabrous.

Var. *HOOKERI*, Eaton. *King's Rep.*, vol. 5, p. 188. (*S. lugens*, Hook. *Fl. Bor. Am.* 1, 332, t. 114.) Deciduously tomentose or smooth; stem simple; leaves entire or glandular-toothed; radical ones oblong-spatulate, cauline lanceolate, acute, clasping; corymb dense; scales of the involucre conspicuously sphaecelate.—*Dr. Smith*. Cañon City, *Brandege*; *Meehan*. Sierra Madre Range, at 11,500 feet altitude, *Coulter*.

Var. *PARRYI*, Eaton. l. c. Slightly webby at first, becoming glabrate; leaves mostly not toothed, rather broad; involucre scales scarcely or not at all blackened at the tips.—Long's Peak and Head of Boulder Cañon, *Coulter*.

Var. *EXALTATUS*, Eaton, l. c. (*S. exaltatus*, Nutt.) Stem and corymb densely webby-tomentose, stout, 1½°-2° high; leaves nearly entire or finely glandular-denticulate, ample; lower ones sometimes 9' long and 2' broad; heads small, in a dense compound, somewhat umbel-like corymb; scales of the involucre with a dark midvein and the tips some-

what blackened.—*Hall & Harbour*, 325. Gray's Peak, *Dr. Smith*. Saugre de Cristo Pass, *Brandege*. *Meehan*. Clear Creek Cañon and Mount Lincoln, at 12,000 feet altitude, *Coulter*.

SENECIO TRIANGULARIS, Hook. Glabrous throughout; stems 2°-4° high, simple, striate, leafy, 3-4 from one root; leaves 3'-5' long, 1½'-3' wide, deltoid-ovate or triangular-lanceolate, sharply and unequally repand-dentate or cut-toothed, acute, truncate or subcordate at the base or abruptly narrowed into a winged petiole; heads rather large, 6" long, few in a loose or sometimes fastigiata corymb; involucre subcylindrical, with a few subulate bractlets at base; scales about 15, lanceolate, with sphaclate tips; rays 6-9, less than twice as long as the involucre; achenia striate, glabrous.—*Hall & Harbour*, 323. Twin Lakes and Mount Lincoln, at 12,000 feet altitude, *Coulter*.

SENECIO ANDINUS, Nutt. Glabrous; stems many from one root, 2°-4° high, simple, striate, very leafy; leaves 3'-5' long, 3"-10" wide, linear-lanceolate, acute at both ends, sharply serrulate with incurved teeth, upper ones sessile, lower ones short-petioled; heads 4" long, numerous, in paniced corymbs; involucre calyculate with small subulate bracts; rays 5-8; disk-flowers 12-20; achenia glabrous.—*Hall & Harbour*, 324. Sierra Madre Range, *Coulter*.

SENECIO INTEGERRIMUS, Nutt. Glabrous throughout; stem simple, striate, 12'-18' high; leaves entire; radical ones 3'-5' long and 1'-2' wide, rather obtuse, tapering into a petiole, somewhat fleshy, upper small, lanceolate, acute, partly clasping; corymb simple or nearly so; heads rather large, 8-20; involucre hemispherical, bracteolate, scales 15-20, narrowly linear, acute, rays about 8, small; disk flowers 40-50; achenia striate, nearly glabrous.—*Hall & Harbour*, 318. "A low form; alpine."

SENECIO AUREUS, L. An extremely variable species, very abundant among the mountains, of which the following are the most marked varieties:

Var. *ALPINUS*, Gr., *Sill. Jour.* (N. S.) v. 33, p. 11. Stem scapiform, bearing 1-2 heads, 3' high, bracteate; radical leaves coriaceous, rounded or obovate-oblong, almost veinless, very entire or somewhat 3-toothed at the apex.—*Hall & Harbour*, 229. White House Mountain, at 13,000 feet altitude, *Coulter*. The specimens of the last collection have the leaves more denticulate; heads sometimes 3.

Var. *WERNERIEFOLIUS*, Gr. *Proc. Am. Acad.*, March, 1863, p. 68. Note. Cespitose, at first arachnoid-woolly; radical leaves numerous, spatulate, oblanceolate or spatulate-linear, attenuate at the base, erect, coriaceous, rigid, veinless, very entire, margins frequently revolute, becoming glabrate, with the petiole 2'-4' long, 2"-3" broad; scapes leafless, 3'-5' high, bracts few, subulate-setaceous, wrapped in wool; corymb 3-8 headed.—*Hall & Harbour*. Clear Creek Cañon, *Coulter*.

Var. *OBOVATUS*, T. & G. Radical leaves roundish-obovate or broadly spatulate, toothed or serrated.—White House Mountain, at 11,500 feet altitude, *Coulter*.

Var. *BOREALIS*, T. & G. Smooth; radical leaves thickish, obovate or spatulate, entire or crenulate-toothed at the apex only.—*Hall & Harbour*, 333; *Dr. Smith*; *B. H. Smith*. Clear Creek Cañon and Twin Lakes, *Coulter*.

Var. *BALSAMITÆ*, T. & G. More or less woolly, becoming glabrous; radical leaves oval and oblong, spatulate and lanceolate, crenate, sharply crenate-toothed or lyrate-ly-incised; achenia glabrous or strigose on the

angles.—Gray's Peak, *Dr. Smith*. Twin Lakes, Bear Creek, Long's Peak, and Ute Pass, *Coulter*. Wet Mountain Valley, *Brandegec*.

Var. *CROCEUS*, *Gr. Proc. Acad. Phil., March, 1863*, p. 68. Smooth; radical leaves roundish-oval, more or less crenately-toothed or incised; corymb rather compact; rays saffron-yellow.—*Hall & Harbour, 332*. South Park, *Porter*. Wet Mountain Valley, *Brandegec*. Twin Lakes, Mount Lincoln, at 12,000 feet altitude, and White House Mountain, at 13,000 feet, *Coulter*.

SENECIO LONGILOBUS, *Benth.* Glabrous; stems 2^o-2½^o high, usually much branched; branches erect; leaves linear, somewhat tapering to the base, 2'-4' in length, 1''-2'' wide, entire or pinnately 3-9 parted, divisions linear, divaricate; heads corymbose, calyculate, with a few small scales, 5'' long; scales of the involucre glabrous, linear-lanceolate, with scarious margins, finely striate; pappus bright white; achenia strigose-canescens. Branches of the panicle often flexuose.—*Canby; B. H. Smith; Hall & Harbour, 328*. Plains around Denver, *Dr. Smith*. Along the Platte, *Coulter*.

SENECIO FILIFOLIUS, *Nutt.*, var. *JAMESII*, *T. & G.* Suffruticose, much branched, densely tomentose-canescens; branches very leafy to the summit; leaves narrowly linear, 3' long, entire or pinnately-parted, divisions 3-9, margins revolute; heads in a terminal corymb, rather large; involucre somewhat calyculate; rays 7-8, linear, rather long; achenia canescensly-strigose.—*Cañon City, Brandegec*.

SENECIO CERNUUS, *Gr. Sil. Jour., (N. S.) v. 33, p. 10*. Glabrous; stem slender, 1½^o high, paniculate at the summit; leaves lanceolate or linear-lanceolate, tapering at the base into a long petiole, subciliate on the margins, sparingly toothed or nearly entire, lower leaves, including the petiole, 4'-7', long, 1' broad; heads numerous, small, scarce 6'' long, nodding, discoid; pedicels 1-2 bracteolate; involucre with a few minute bracteoles at base; achenia very glabrous.—*Hall & Harbour, 320; Parry, 52; Dr. Smith. Ute Pass, Porter. Twin Lakes, Porter*.

SENECIO CANUS, *Hook.* Whitish-tomentose throughout; stems tufted, 2'-12' high; radical leaves oblong-spatulate, entire, cauline sessile, lanceolate, partly clasping, sinuate-pinnatifid or somewhat toothed towards the base; heads few, in a simple corymb; involucre nearly ecalyculate; rays 8-12, short; achenia glabrous.—*Hall & Harbour, 330*. "Alpine and sub-alpine," *Parry, 20*.

SENECIO EREMOPHILUS, *Richards.* Perennial, glabrous; stem striate, often purplish, 1^o-4^o high, corymbosely branched toward the summit, leafy; leaves short-petioled, 2'-3' long, 6''-12'' wide, lower sometimes larger, deeply incised, with unequal, ovate-lanceolate, toothed segments, sometimes deeply parted, with linear segments which are sharply toothed; heads many, in compound corymbs; involucre cylindrical-bell-shaped; calyculate bractlets few; scales often blackish-tipped and sphacelate; rays 7-9, rather long; achenia striate, glabrous.—*Hall & Harbour, 327*. Near Denver, *Dr. Smith. Ute Pass, Porter. Cañon City, Brandegec. Near Mount Lincoln, Coulter*.

SENECIO FREMONTII, *T. & G.* Perennial, glabrous; stems 1-several, 3'-15' high, leafy to the top, often decumbent; leaves sessile, oblong or obovate-spatulate, somewhat fleshy, laciniate-dentate or obscurely toothed, upper ones 1'-2' long, lower ones gradually smaller; heads solitary or few, on very short, erect peduncles; involucre bell-shaped, 4''-6'' long, sparingly bracteolate; rays 10-16, yellow; achenia glabrous. "Alpine."—*Hall & Harbour, 322. Dr. Smith. Twin Lakes, Coulter*.

SENECIO BIGELOVII, Gr. in *Bot. Whipple Exped., Pacif. R. R. Surv.*, 4, p. 111. Glabrous; stem simple, stout, erect, 18'-20', from a perennial root, racemose at the summit, bearing 3-15 heads; leaves ovate-lanceolate, acuminate, sharply callous-dentate, contracted into a large margined petiole; uppermost lanceolate, narrowed at the base, partly clasping; heads large, nodding, homogamous; involucre broadly campanulate, with a few short setaceous bracteoles at base; scales 10-12, acute, equal, outer ones lanceolate, inner ones broader, scarious-margined; rays none; achenia very glabrous.

Var. **HALLII**, Gr. *Proc. Acad. Phil.*, March, 1863, p. 67. Note. Leaves almost all lanceolate, more or less woolly pubescent, hairs articulated; cauline leaves all sessile or the lowest contracted into a winged petiole.—*Hall & Harbour*, 321. *Canby*. Cañon City, *Brandege*. Mount Elbert and Sierra Madre Range, *Coulter*.

SENECIO AMPLECTENS, Gr. l. c. Slightly woolly, becoming glabrate; stem 6'-15' high from a perennial root, naked at the apex, bearing 1-3 heads; leaves membranaceous, oblong or lingulate, either repand or very sharply-toothed or even sub-laciniate, lowest narrowed at the base or attenuated into a winged petiole, upper sessile, half-clasping by a broad base; heads upon long, slender peduncles, nodding; involucre loosely calyculate; rays linear, elongated, 1'-2' long, golden-yellow; achenia very smooth.—*Hall & Harbour*, 317. *Canby*. Gray's Peak, *Dr. Smith*; *Meehan*. White House Mountain, at 13,000 feet altitude, La Plata Mountain, at 12,000 feet, and Horse Shoe Mountain, at 11,000 feet, *Coulter*.

Var. **TARAXACOIDES**, Gr. l. c. Truly alpine; 2'-5' high, bearing a single head; head smaller, less nodding; rays less than 1' long; leaves all attenuated at base, more or less laciniate.—Summit of Pike's Peak, *Canby*. Sange de Cristo Pass, *Brandege*.

SENECIO SOLDANELLA, Gr. *Proc. Acad.*, March, 1863, p. 67. Note. Subcaulescent, 4'-5' high; very smooth, sub-glaucous; stems bearing a single head, rarely more; root fasciculate-fibrous; leaves thick, purple-tinged beneath, radical and lowest orbiculate, occasionally somewhat reniform, contracted at the 3-nerved base into a long or very long flat petiole, often somewhat denticulate, 1'-2' in diameter, upper ones 1-3, smaller, oblong or spatulate, on short dilated petioles; heads large, somewhat nodding, 8"-12" broad and about as long; scales of the involucre lanceolate, with scarious margins, 16-20, with 7-9 of the outer ones narrower, and without margins, looser and either a little or one-half shorter; rays oblong, 16-18, yellow, about 4' long, scarcely surpassing the disk; achenia very glabrous.—*Hall & Harbour*, 319. "High alpine, among rocks." Sange de Cristo Pass, *Brandege*. Mount La Plata, at 14,000 feet altitude, and White House Mountain, at 13,000 feet, *Coulter*.

SENECIO RENIFOLIUS, Porter, (*n. sp.*) Very smooth; stems, as well as the petioles and under surfaces of the leaves, bright purple, numerous, ascending from a long, slender, creeping purple root-stock, 1½'-2' high; leaves clustered at the base, all reniform, crenate, or crenate-lobed, 4'-6' long, on flattened petioles of the same length, dark green above; upper leaves 1-2, spatulate, crenate, sessile; peduncle somewhat elongated, bearing a single erect head, about 4'-6" long, 4'-5" broad; scales of the involucre rather shorter than the disk, nearly equal, 4' long, lanceolate and linear-lanceolate, purple, inner ones with slightly scarious margins; calyculate scales few, minute, subulate; rays oblong, about 4' in length; bright yellow; achenia glabrous. High alpine.—White House Mountain, at 13,000 feet altitude, *Coulter*.

TETRADYMIA¹ **CANESCENS**, DC., var. **INERMIS**, Gr. (*T. inermis*, Nutt.) Shrubby, much branched, 1°-2° high, silvery-canescens, unarmed; leaves thickish, short, 6"-9" long, 1"-2" wide, densely tomentose, acute but scarcely mucronate; axillary fascicles of smaller leaves none; heads corymbose-clustered; involueral scales 2"-4" long, four, oblong, obtuse, carinate; florets 4; achenia sparingly villous with short, soft hairs, soon becoming nearly smooth.—North Park, *Hayden*. Upper Arkansas, *Porter*. Arkansas River, *Coulter*.

TETRADYMIA GLABRATA, T. & G. *Pacif. R. R. Rep.*, 2, p. 122, t. 5. Shrubby, divaricately branched, unarmed; young branchlets and foliage loosely clothed with white floccose wool which is soon deciduous; leaves subulate or acerose, rather fleshy, primary ones erect, not spinescent, 3"-6" long, $\frac{1}{2}$ " wide, linear-subulate, mucronate, producing the next year from their axils shorter, obtuse, ericoid leaves; heads corymbose; scales of the involuere 4, white-pubescent or glabrate, about 4" long; florets 4; achenia villous, the hairs much shorter than the pappus.—Wet Mountain Valley, *Brandege*.

CIRSIIUM UNDULATUM, Spreng.—Near Denver, *Dr. Smith*. Along the Platte, and also a form with yellowish flowers, *Coulter*.

CIRSIIUM VIRGINIANUM, Mx.—Wet Mountain Valley, *Brandege*. Along the Platte, *Coulter*.

CIRSIIUM FOLIOSUM, DC., (*C. edule*, Nutt.) Stem erect, stout, striate, somewhat woolly, branched toward the top; leaves loosely webby on both surfaces, elongated, 6"-11" long, not over 1" wide, irregularly sinuate-toothed, teeth triangular, and the veins ending in strong stramineous spines; heads large, glomerate in the axils of the uppermost leaves, or peduncled; involueral scales linear-lanceolate, appressed, spine-tipped, arachnoid-tomentose.—Near Denver, *Dr. Smith*. *Hall & Harbour*, 330 and 341. Weston's Pass and Sierra Madre Range, *Coulter*. *Engelm.*

CIRSIIUM DEUMMONDII, T. & G. Stemless or with simple stems, 1°-2° high, sparsely hairy; leaves green and smooth above, paler and slightly webby beneath, radical ones oblanceolate or spatulate, primary ones entire, with ciliate-spinulose margins, later ones and the stem-leaves pinnately toothed or incised, often doubly so, and spiny with weak slender prickles; heads 1-4, sessile or short-stalked, surrounded either by the radical leaves or by a circle of leaves at the top of the stem; involuere glabrous, or with the scales softly ciliate on the margins; scales triangular-lanceolate, appressed, tipped with weak prickles; flowers red or purplish. *Engelm.*

(a.) Caulescent form. *Hall & Harbour*, 343. (b.) Acaulescent form. *Hall & Harbour*, 339. Sierra Madre Range, *Coulter*. *Engelm.*

CIRSIIUM ERIOCEPHALUM, Gr. *Proc. Acad. Phil.*, March, 1863, p. 69. Stem 1°-2° high, simple, leafy, deciduously arachnoid-tomentose; leaves nearly smooth above, paler and webby beneath, far decurrent, linear or oblong-linear, pinnatifid, with very numerous, crowded, short, very spiny lobes; heads several, sessile, in a dense terminal cluster, involuere with very spiny foliaceous bracts which pass gradually into spinulose-ciliate, spine-tipped involueral scales, which are clothed with a finely

¹**TETRADYMIA**, DC. Heads 4-flowered, (in one species 5-9-flowered;) the flowers all tubular, perfect and fertile; the corollas funnel-form with a long slender tube, deeply 5-lobed, the linear lobes slightly recurved. Involuere of 4 (rarely 5-6) sub-equal concave-carinate, rigid, oblong, scales. Receptacle very small, naked. Anthers linear, exserted. Branches of the style linear, with very short, ovate, obtuse, pubescent appendages. Achenia oblong-linear, villous or glabrate. Pappus copious, of very fine, unequal, capillary, denticulate filaments as long as the tube of the corolla.

tomentose wool, inner scales entire, spine-tipped; flowers yellow.—*Hall & Harbour*, 341. Sangre de Christo Pass, *Braudegee*. White House Mountain and Mount La Plata, at 13,000 feet altitude, *Coulter*.

CIRSIUM OCHROCENTRUM, Gr. *Pl. Fendl.*, p. 110. Stem very leafy, erect, 2°-3° high, webby-tomentose; leaves pinnatifid, sessile; uppermost decurrent, becoming glabrate; cauline leaves 4'-6' long, very spiny; spines 6" in length, yellow; heads subsolitary, sessile on the ends of the branches, rather small, 1' or less in diameter; scales of the globose involucre glabrous, abruptly ending in stout yellow spines 6" in length.—Wet Mountain Valley, *Braudegee*.

*STEPHANOMERIA*¹ *MINOR*, Nutt. (Including *S. runcinata*, Nutt.) Perennial, glabrous; stems single, much branched, 1°-2° high, lower leaves 2'-3' long, runcinately toothed, upper ones reduced to subulate entire, 2-4 toothed bracts; heads 5-7 flowered, solitary on the ends of the branchlets; proper involucre scales 5-7, 4"-5" long; achenia 5-ribbed, smooth; pappus of 15 distinct setæ, plumose nearly or quite to the base.—*Hall & Harbour*, 346. Plains near Denver, *B. H. Smith*. Colorado Springs, *Porter*.

CYNTHIA VIRGINICA, Dob.—Wet Mountain Valley, *Braudegee*; *Redfield*.

TRIXIMON CUSPIDATUM, Pursh.—Plains around Denver and Saint Vrain River, *Coulter*.

HIERACIUM FENDLERI, Schultz. (*Crepis ambigua*, Gr. *Pl. Fendl.*, p. 114.) Stem scape-form and simple from a perennial root, or with 1 or 2 elongated branches from the base or near it, each bearing 5-8 heads; leaves obovate-oblong, very entire, beset with scattered, spreading, hispid bristles, otherwise very smooth, 2'-3' long, sessile, the radical with a tapering base, somewhat purplish underneath; heads 9" long, on rather long peduncles; florets about 30; involucre cylindrical, hairy, scales linear, exterior ones twice shorter, appressed; ligules very short, a little longer than the pappus, usually a little shorter than the styles; achenia fusiform, narrowed upwards, but not truly rostrate, 4" in length, many-ribbed, very smooth, as long as the copious, dull-white pappus.—*Mace's Hole*, *Fremont County*, *Braudegee*. *Parry*. Wet Mountain Valley, *Redfield*.

HIERACIUM ALBIFLORUM, Hook. Stems simple, 1°-3° high, rather slender, smooth above, hispid near the base, like the petioles and midribs, with rather long deflexed hairs; leaves mostly radical or low on the stem; oblong-lanceolate, acute, entire or denticulate; heads rather small, on nearly smooth, bracteolate pedicels, in a compound, at length very open corymb; involucre nearly ecalyculate, the blackish scales sparsely hairy; flowers white; about 20; achenia very slightly narrowed toward the summit.—*Hall & Harbour*, 350, "subalpine, west of the range; rare." Mountain of the Holy Cross, *Coulter*.

HIERACIUM TRISTE, Willd. Stem slender, simple, 6'-12' high, smooth below, hispid with blackish hairs above; leaves chiefly radical, hirsutulous or smooth, entire or remotely denticulate, mucronate, tapering into slender petioles; involucre hispid with blackish hairs; flowers 20-30;

¹ *STEPHANOMERIA*, Nutt. (Including *Hemiphitess*, Gray.) Heads 3-12 flowered; the flowers all ligulate. Involucre cylindrical, calyculate; bractlets few, very small; proper scales 3-7, subequal, but in two species more numerous, unequal and imbricated. Receptacle naked, slightly honey-combed. Achenia oblong-linear or clavate-oblong, with 5 prominent angles or ribs, the intercostal spaces either plain or tuberculate, rugose, or occupied by additional less elevated ridges. Pappus simple, of 5-25 plumose, filiform setæ or bristles, slightly dilated at the base.

achenia oblong, not narrowed at the summit.—*Hall & Harbour*, 349. Sierra Madre Range and Twin Lakes, *Coulter*.

NABALUS RACEMOSUS, Hook.—*Hall & Harbour*, 351. "South Park; rare." Wet Mountain Valley, *Brandegee*.

LYGODESMIA JUNCEA, Don.—*Hall & Harbour*, 345. Plains near Denver, *Dr. Smith*. Colorado Springs, *Porter*. Cañon City, *Brandegee*; *Redfield*. Plains of the Platte, *Coulter*.

Var. *ROSTRATA*, Gr. *En. Hall & Harbour*, p. 69. *Note*. Achenia attenuate-rostrate at the apex, 6' long; heads often 8-9 flowered; leaves very narrowly linear, elongated, 3'-4'. Near Greeley, *Greene*.

PYRRHOPAPPUS GRANDIFLORUS, Nutt. Scape simple, naked, much longer than the deeply pinnatifid and ciliate radical leaves, bearing a single head, 1° high, with a small bract in the middle; involucre slightly canescent; ligules golden-yellow; pappus fulvous, with a villous ring at base; achenia produced into a long, slightly scabrous beak.—Plains of Eastern Colorado, *Dr. Bell*.

*CREPIS*¹ *RUNCINATA*, T. & G. Perennial, slightly hirsute, becoming smoother; radical leaves obovate or oblong-lanceolate, runcinate-lobed or only slightly toothed, tapering to the base, 2'-7' long; scape 1°-2° high, branching, bearing a few linear, bract-like leaves; branches and involucre more or less hirsute with blackish, often glandular, hairs; involucre many-flowered, calyculate; scales linear-lanceolate, with scarious margins; achenia striate, slightly tapering upwards.—*Hall & Harbour*, 348. South Park, *Porter*. Wet Mountain Valley, *Brandegee*. Bear Creek and Sierra Madre Range, *Coulter*.

CREPIS OCCIDENTALIS, T. & G. Perennial, canescent, with a close furfuraceous pubescence; stem 6'-18' high, branching, leafy; radical leaves, with the petiole, 6'-9' long, lanceolate, tapering both ways, acuminate, more or less deeply runcinate-pinnatifid, with acute, often toothed lobes; cauline leaves similar, but smaller and sessile; heads corymbed, 11-35 flowered; involucre calyculate, with a few loose bractlets, the proper scales 8-10, 6'-8' long; mature achenia rather stout, 3' long, tapering to the apex, evidently 10-striate.—*Hall & Harbour*, 353.

Var. *GRACILIS*, Eaton. (*C. acuminata*, var. *gracilis*, Torr. Ms.) Stem very slender, bearing 3-6 narrow, 9-14 flowered heads; leaves narrowly linear, long-acuminate, with a few very narrow, almost filiform, elongated teeth near the middle.—Middle Park, *Parry*, 1864.

CREPIS NANA, Richards. Perennial, nearly acaulescent; scapes numerous from the summit of the somewhat fusiform caudex, bearing 1 or more, about 14-flowered heads, scarcely equalling the elliptical, or roundish, entire, or sinuate-lyrate, long petioled leaves; petioles purplish; rays yellow; involucre few-flowered, cylindrical, exterior calyculate-scales short and appressed; receptacle naked; achenia slender, 5-10 striate, narrowed at the apex, scarcely rostrate.—Mount Lincoln, at 12,500 feet altitude, *Coulter*.

¹*CREPIS*, L. Heads several-many-flowered; the flowers all ligulate. Involucre usually calyculate with a few small bracteoles, the proper scales nearly equal, in a single series. Receptacle naked or slightly hairy. Achenia terete or somewhat compressed, 8-30 striate, usually narrower above or even tapering into a short beak, the apex expanded into a minute disk. Pappus pure white, copious, of denticulate or scabrous delicate capillary bristles, or sometimes of more rigid bristles slightly dilated toward the base.

MACRORRHYNCHUS¹ GLAUCUS, Eaton. (*Troximon glaucum*, Nutt.) *King's Rep.*, vol. 5, p. 204. Perennial, smooth and somewhat glaucous; leaves linear-lanceolate or lanceolate, 3'-6' long, about 6" broad, entire or slightly runcinately-toothed; scape 6'-9' high; involucre scales unequal, the outer ones shorter and broadly ovate-lanceolate, slightly pubescent, inner ones lanceolate, 7"-9" long; achenia 10-ribbed, contracted toward the summit, but scarcely beaked; pappus rather coarse, longer than the achenium.—*Hall & Harbour*, 354 in part. Wet Mountain Valley, *Brandegee*. Common on the plains of the Platte, *Coulter*. Gray's Peak, *Dr. Smith*.

Var. **DASYCEPHALUS**, T. & G. "Involucre woolly, at least when young, exterior scales spreading; leaves and scape often somewhat pubescent; receptacle sometimes but not always furnished with a few linear, acuminate, chaffy scales intermixed among the flowers."—*Hall & Harbour*, 356. Along the Platte and in the Sierra Madre Range, *Coulter*.

MACRORRHYNCHUS TROXIMOIDES, T. & G. Perennial, smooth and somewhat glaucous; leaves oblanceolate, or linear-lanceolate, 4'-10' long, 3"-9" wide, acuminate or obtuse and slightly apiculate, entire or laciniately pinnatifid; scapes 4'-2^c high; involucre 6"-10" long; scales nearly equal, lanceolate from a broad base; achenia 10-ribbed, at length produced into a slender beak two-thirds as long as the achenium proper and with it slightly or considerably longer than the pappus.—*Hall & Harbour*, 355. "Very variable at all heights, even alpine; flowers in July and August." Near Denver, *B. H. Smith*. Wet Mountain Valley, *Brandegee*. Plains of the Platte, Twin Lakes and White House Mountain at 12,000 feet altitude, *Coulter*.

TARAXACUM PALUSTRE, DC. Sparingly tomentose, at length very smooth; leaves lanceolate or oblong-spatulate, entire, sinuate, or strongly runcinate, usually shorter than the scape, 4'-8' long, 5"-2' broad, obtuse or acutish; inner scales of the involucre, more or less conniculate, lanceolate, outer scales ovate, appressed, much shorter; achenia muricate and spinulose towards the apex, when mature scarce half the length of the beak. Scapes 4'-12' high.—*Hall & Harbour*, 357. Wet Mountain Valley and Sangre de Cristo Pass, *Brandegee*. Clear Creek Cañon; Mount Lincoln, at 14,000 feet altitude, and White House Mountain, at 13,000 feet, *Coulter*.

MULGEDIUM PULCHELLUM, Nutt.—*Hall & Harbour*, 344. Near Denver, *Dr. Smith*; *B. H. Smith*. Colorado Springs, *Porter*.

LOBELIACEÆ.

LOBELIA SYPHILITICA, L.—Wet Mountain Valley, *Brandegee*. Near Denver, *Dr. Smith*; *Greene*.

LOBELIA CARDINALIS, L.—Pueblo, *Greene*, 1873.

CAMPANULACEÆ.

CAMPANULA ROTUNDIFOLIA, L. *Hall & Harbour*, 358. Near Denver, *Dr. Smith*; *B. H. Smith*. Colorado Springs, *Porter*. North Park, *Hayden*. Plains of the Platte, *Coulter*.

¹**MACRORRHYNCHUS**, Lessing. Heads many-flowered, the flowers all ligulate; involucre campanulate; the lanceolate or ovate-lanceolate scales imbricated in 2-3 series, the inner ones scarious-margined, the outer ones sometimes shorter, often foliaceous. Receptacle naked, or very rarely with a few chaffy scales among the flowers. Achenia glabrous, terete or slightly obcompressed, 10-ribbed or winged, narrowed above and in most species at length produced into a long slender beak, the apex dilated into a small flat disk. Pappus of copious, white, scarcely scabrous, soft and capillary or coarser and somewhat rigid bristles.

CAMPANULA LANGSDORFFIANA, Fisch. Glabrous; stem simple, slender, erect, 4'-1° high, leafy toward the base, 1-flowered; leaves sparsely denticulate, radical ones spatulate, 1'-2' long, tapering to the base, stem-leaves narrowly lanceolate or linear; ovary obconic; calyx-lobes lanceolate, acuminate, serrulate on the margins, more than half as long as the corolla; corolla spreading-campanulate, deeply 5-lobed, narrowed toward the base, large for the size of the plant, 1' in diameter.—*Hall & Harbour*, 359. "Very common in the subalpine region and lower, in wet ground." North Park, *Hayden*. Wet Mountain Valley, *Brandege*. South Park, *Porter*. Sierra Madre Range and Ute Pass, *Coulter*.

CAMPANULA UNIFLORA, DC. *Prod.* 7, p. 482. Stem 1-flowered; leaves subentire, lower obovate, petioled, the middle ones obovate-lanceolate and the upper ones occasionally linear-lanceolate; calyx slightly villous with linear acuminate lobes, nearly equaling the funnel form corolla; capsule cylindrical; stems 2'-4' high.—*Hall & Harbour*, 360. "Pike's Peak; high alpine." Divide between Sacramento and Mosquito, at 13,000 ft. lat., *Coulter*. Sangre de Cristo Pass, *Brandege*. *W. H. Raven*

CAMPANULA APARINOIDES, Pursh.—*Hall & Harbour*, 361.

SPECULARIA PERPOLIATA, A. DC.—Plains of the Platte near Denver, *Coulter*. Golden City, *Greene*.

ERICACEÆ.

VACCINIUM CÆSPITOSUM, Mx.—*Hall & Harbour*, 363.

VACCINIUM MYRTILLUS, L. Branches sharply-angled, green; leaves deciduous, ovate, minutely serrate, glabrous, shining; peduncles 1-flowered, solitary, axillary, nodding; stem 6'-1° high, very diffusely branched; flowers small, 1" in length, white; fruit small, about 2" in diameter, light red. Leaves variable in size, 2'-6" long, 2"-6" broad. Alpine and subalpine.—*Hall & Harbour*, 362. Cañon City, *Brandege*. Georgetown, *Dr. Smith*. Clear Creek Cañon, *Coulter*.

ARCTOSTAPHYLOS UVA-URSI, Spreng.—*Hall & Harbour*, 364. *Dr. Smith*; *B. H. Smith*; *Porter*. Common in the mountains, *Coulter*. The "Kinnikinick" of the Indians.

GAULTHERIA MYRSINITES, Hook. *Fl. Bor.-Am.* 2, p. 35, t. 129. Low, trailing; stems 2'-6" long, leaves orbicular-ovate, ciliate-serrate, shining, 4'-9" in diameter; flowers solitary, with several ovate bracts; subcampanulate corolla scarcely exceeding the calyx, white, 1" in length; anthers obtuse; filaments glabrous; disk none; fruit scarlet.—*Hall & Harbour*, 365.

KALMIA GLAUCA, Ait., var. *MICROPHYLLA*, Hook. Stems leafy, 1'-2' long; leaves somewhat oval, scarcely 6" in length; flowers 1-4, on pedicels 1' long. Alpine.—*Hall & Harbour*, 370.

PYROLA ROTUNDIFOLIA, L., var. *ULIGINOSA*, Gr.—*Hall & Harbour*, 367; *Parry*. Wet Mountain Valley, *Redfield*.

PYROLA CHLORANTHA, Swartz.—*Hall & Harbour*, 368; *Meehan*.

PYROLA SECUNDA, L.—*Hall & Harbour*, 366. Georgetown, *Dr. Smith*; *Meehan*. Twin Lakes, *Coulter*.

PYROLA MINOR, L.—*Parry*. Twin Lake Creek, at 10,000 feet altitude, *Coulter*. Alpine forests, Jefferson County, *Greene*.

MONESSES UNIFLORA, Gr.—*Hall & Harbour*, 369. Wet Mountain Valley, *Brandege*. Mount La Plata, at 11,000 feet altitude, *Coulter*.

PTEROSPORA ANDROMEDA, Nutt.—North Park, *Hayden*. Chianu Cañon, *Porter*. *Hall & Harbour*, 371. Sangre de Cristo Range, *Redfield*.

PLANTAGINACEÆ.

PLANTAGO ERIOPODA, Torr. *Ann. N. Y., Lyc.* 2, p. 237. Perennial; base of the leaves and scape invested with a long dense wool of a rusty brown color; leaves broadly lanceolate, 4'-6' long, 1'-2' wide, attenuate at each end, long-petioled, acute, very smooth and entire, distinctly 5-nerved; scape 6'-10' high, terete, very glabrous; spike cylindrical, 3'-6' long, of rather remote, perfect flowers; stamens and styles very long; bracts broadly ovate, obtusish; capsules 2-celled, 4-5 seeded; seeds not hollowed.—*Hall & Harbour*, 372. South Park, *Porter*. Weston's Pass, *Coulter*.

PLANTAGO PATAGONICA, Jacq., var. *GNAPHALIOIDES*, Gr. Very abundant on the plains. *Hall & Harbour*, 374. Near Denver, *Dr. Smith*. Colorado Springs, *Porter*; *B. H. Smith*. Plains of the Platte, *Coulter*.

Var. *ARISTATA*, Gr.—Plains of the Platte, *Coulter*.

PRIMULACEÆ.

PRIMULA PARRYI, Gr. *Sill. Jour. (N. S.)* 34, p. 257. Leaves oblanceolate, narrowed to a broad, fleshy petiole, and with the rest of the plant somewhat glandular-scarious, at least upon the margin, which is entire or denticulate with short glandular teeth, 6'-12' long; scapes 4'-16' high; flowers rose-color, becoming purple in drying, 6-15, on unequal pedicels, $\frac{1}{2}$ '-3' long; leaves of the involucre subulate or linear, unequal, acute, several times shorter than the elongated pedicels; calyx-lobes broad-lanceolate, acute, equaling the tube of the pink corolla; corolla-lobes rounded, obcordately 2-cleft or emarginate. Alpine and sub-alpine; common.—*Parry*, 311; *Hall & Harbour*, 379. Gray's Peak, *Dr. Smith*; *Meehan*. Mount Lincoln, at 13,000 feet altitude, July 9, *Coulter*. *Redfield*.

PRIMULA ANGUSTIFOLIA, Torr. *Ann., N. Y. Lyc.* 1, p. 34, t. 3, fig. 3. Tufted, from a thick rootstock; scapes 3''-12'' high, leafless; leaves elliptical-lanceolate or oblong, sometimes spatulate, 6''-12'' long, obtuse, membranaceous, veinless, glabrous, very entire; scape solitary, 1-flowered, shorter than the leaves, with a bract a little below the flower; calyx cylindrical-oblong, 5-6 cleft, smooth, segments subulate, erect; corolla purple, sub-campanulate, tube $\frac{1}{2}$ longer than the calyx, limb erect, spreading, with ovate, obtuse, very entire segments, 6''-7'' broad; stamens in the tube of the corolla; filaments very short; anthers oblong, 2-celled; style 1, straight, persistent; stigma globose; capsule ovate. High-alpine.—*Pike's Peak*, *Porter*; *Parry*. James's Peak, at 12,000 feet altitude, Mount Lincoln, at 13,000 feet, and Mount La Plata, at 14,000 feet, *Coulter*. Gray's Peak, *Redfield*.

PRIMULA FARINOSA, L.—*Hall & Harbour*, 378. Cañon City, *Brandegee*. Colorado Springs, *Porter*. South Park, *Coulter*.

ANDROSACE SEPTENTRIONALIS, L. *DC. Prod.* 8, p. 52. Annual, scapulescent, minutely pubescent; leaves rosulate, lanceolate or lance-ovate, $\frac{1}{2}$ '-1' long, denticulate, on a broad petiole; scapes numerous, many-flowered, 3-20, $\frac{1}{2}$ '-6' high; leaflets of the involucre subulate, acute; calyx-lobes ovate-lanceolate, acuminate, equaling the corolla; pedicels numerous, filiform; calyx-tube obconic. Common at all elevations from low sub-alpine to alpine.—*Hall & Harbour*, 376; *Parry*. Cañon City, *Brandegee*; *Canby*. Georgetown, *Dr. Smith*; *B. H. Smith*. *Porter*. Clear Creek Cañon, Long's Peak, and the Sierra Madra Range, *Coulter*.

ANDROSACE FILIFORMIS, Retz. *DC. Prod.* 8, p. 53. Acaulescent;

leaves rosulate, ovate, or ovate-rotund, subacute, very smooth, serrate-dentate, petiolate, petiole winged, nearly equaling the limb; scapes numerous, erect, filiform, sparingly pilose above; involucre small; pedicels 20-30, capillary; calyx 5-cleft, campanulate, very smooth, lobes equaling the tube or a little shorter, lance-ovate, acute; limb of the corolla very small, with obtuse, lance-ovate lobes.—Much smaller and more delicate in all its parts than the preceding, which it much resembles, but is readily distinguished by its subglobose calyx with shorter and less spreading teeth.—“Subalpine; not rare.” *Hall & Harbour*, 375.

ANDROSACE OCCIDENTALIS, Nutt.—“On the plains.” *Hall & Harbour*, 377.

ANDROSACE CHAMELJASME, Willd. *DC. Prod.* 8, p. 51. (*A. carinata*, Torr.) Stems erect; 1'-2' high; leaves rosulate, much crowded, ovate-lanceolate, acute, very entire, scarcely petioled, subglabrous on both sides, ciliate on the margin; scapes 1 or few, 2-5-flowered, villous with jointed hairs; leaflets of the involucre equaling the pedicels or a little shorter, lance-ovate, villous, ciliate; lobes of the campanulate calyx about 5, pilose, about equaling the tube, acute or obtuse; lobes of the corolla entire, ovate, sinuate; capsule globose, $1\frac{1}{2}$ " in diameter. High alpine.—Pike's Peak, *Porter*. *Hall & Harbour*, 202. Sangre de Cristo Pass, *Brandegee*. Mount Evans, *Greene*.

DODECATHEON MEADIA, L.—*Hall & Harbour*, 381; *Meehan*. Middle Boulder, *Coulter*. South Park, *Porter*. Subalpine and alpine.

LYSIMACHIA CILIATA, L.—“Mountains at medium height,” *Hall & Harbour*, 382; *Meehan*.

GLAUX MARITIMA, L.—*Hall & Harbour*, 60 and 577. South Park, *Porter* and *Coulter*.

LENTIBULACEÆ.

UTRICULARIA VULGARIS, L.—“In a subalpine lake.” *Hall & Harbour*, 580. Cold Marsh, near Long's Peak, *Coulter*.

UTRICULARIA GIBBA, L.—Alpine lake, 1870, *Greene*.

OROBANCHACEÆ.

PHELIPSEA LUDOVICIANA, Don.—On roots of *Artemisia frigida*, Willd., *Meehan*.

APHYLLON FASCICULATUM, T. & G.—*Hall & Harbour*, 383. Near Denver, *B. H. Smith*; *Meehan*. Cañon City, *Brandegee*. South Park, *Porter*. Monument Park and Weston's Pass, *Coulter*. *Two lakes on*

APHYLLON UNIFLOREM, T. & G.—Golden City, *Greene*. *at base*

SCROPHULARIACEÆ.

LINARIA CANADENSIS, Spreng.—Golden City, *Greene*.

SCROPHULARIA NODOSA, L.—Foot-hills west of Denver, *Porter*. Bear Creek, *Coulter*; *Greene*. *Empire*

COLLINSIA PARVIFLORA, Dougl.—*Hall & Harbour*, 402. Cañon City, *Brandegee*. Saint Vrain Cañon, *Coulter*.

PENTSTEMON BARBATUS, Nutt. *Gr. Rev. Pentst. Proc. Am. Acad.*, 6, p. 59. Very glabrous, 2°-3° high; leaves very entire; upper ones linear-lanceolate; panicle lax, elongated; segments of the short calyx margined; corolla strongly bilabiate, scarlet, 1' or more long, upper lip broad, con-

cave, slightly emarginate-bifid, lower deflexed, deeply 3-cleft, scarce equal in length to the upper, usually bearded; tube elongated, scarcely ampliate; sterile filament naked.

Var. *TORREYI*, Gr. *Bot. Mex. Bound.*, p. 114. (*P. Torreyi*, Benth. in *DC. Prod.* 10, p. 324.) Tall, 2°-3° high, glaucous; leaves entire, cauline sessile, lanceolate or linear; panicle elongated, few-flowered; corolla 1'-1½' long, somewhat dilated above, throat less bearded or naked; lips, especially the upper, a little longer; bright scarlet.—*Hall & Harbour*, 395. Cañon City, *Brandegee*. Upper Arkansas, *Porter*. Ute Pass, *Coulter*. Not common.

PENTSTEMON GLABER, Pursh. *Gr. Rev. l. c.*, p. 59. Very glabrous; stems 6'-3° high, usually several from the same root, stout; leaves fleshy, glaucous, sessile, entire, 2'-4' long, 4'-9" wide; flowers large, showy, in a thyrsoid panicle, violet-purple, 12'-15" long; sepals broadly ovate, submembranaceous on the margin, obtuse or more or less pointed; corolla bright purple, showy, widely dilated above, the limb shortly 2-lobed with the lobes rounded and spreading equally, bearded in the throat; anthers loosely hairy, hirsutulous or glabrous, the divaricate cells dehiscent from the base nearly to the summit, but not expanded; the sterile filament short-hirsute toward the apex or glabrous.—*Hall & Harbour*, 384. Monument Park, *Porter*. Plains near Denver, *Dr. Smith*. Common.

Var. *ALPINUS*, Gr. (*P. alpinus*, Torr.) Dwarf, 4'-12' high, more strict, sometimes pruinose-puberulent; sepals from an ovate base or oblong-lanceolate, long acuminate.—*Parry*. "Rocky Mountains on both sides." *Hoopes*.

PENTSTEMON CYANANTHUS, Hook. *Gr. Rev. l. c.*, p. 60. (*P. glaber*, var. *cyananthus*, Gr.) Glabrous; stems slender but sometimes stout-1½°-2° high; cauline leaves broadly ovate or oblong, acute or acuminate, 2'-4' long, 1'-2' broad; thyrsoid panicle usually very short, 4' long; sepals ovate-lanceolate with a long attenuated acumination; otherwise as in *P. glaber*.—*Platte River, Coulter*.

Var. *BRANDEGEEI*, Porter. Minutely puberulent except the peduncles and flowers; stem stout, erect, 1½°-2° high; leaves opposite, very entire, thick, coriaceous, veiny, the lower ones spatulate or ovate-lanceolate, narrowed to the base, upper ones much larger, somewhat crowded, cordate-ovate, sessile, clasping and almost connate, finely ciliate on the margins, 2'-3' long, 1'-1½' broad; bracts of the ample thyrses (6' long) similar but smaller; cymes 6-8-flowered; calyx-segments broad-ovate, with scariouserose-denticulate margins, subulate-acuminate, glabrous; corolla 1'-1½' long, abruptly ventricose-campanulate, the upper part and the rounded lobes bright azure blue, paler or white beneath, slightly hairy in the throat, smooth within; sterile filament scantily bearded under the dilated apex; capsule ovoid, acute.—*Sierra Mojado, Brandegee*.

PENTSTEMON FREMONTI, Gr. *Gr. Rev. l. c.*, p. 60. Pruinoso-puberulent, a span or more high; lower leaves spatulate, cauline lanceolate, sessile; panicle strict, spike-form, naked, cymules approximate, many-flowered, very short-peduncled; sepals oblong-ovate, acute, membranous on the margin; corolla 9" long, narrowly funnel-form, scarcely bilabiate; anthers sparingly hirsute; sterile filament dilated and bearded at the apex.

Var. *PARRYI*, Gr. *King's Rep.* vol. 5, p. 218. Stem slender, 1°-2° high; leaves lanceolate or ovate-lanceolate, 2' long, 4'-9" wide; panicle few-many-flowered, more or less interrupted, with the pedun-

cles, 6"-12" long; flowers purple or occasionally nearly white; anthers glabrous except along the dehiscence.—Colorado, *Parry*.

PENTSTEMON CÆRULEUS, Nutt. *Gr. Rev. l. c.*, p. 61. (*P. angustifolius*, Nutt.) A span high; glabrous or the upper stem and leaves usually minutely pubescent; leaves linear-lanceolate, thick, entire, sessile, erect, crowded; sepals lanceolate, gradually acuminate, often ciliate on the margins, white-membranaceous; corolla 6" long, somewhat dilated, scarcely 2-lipped, bright azure or purplish-blue; anthers glabrous, often with short-ciliate margins; sterile filament, usually dilated and yellow-bearded at the apex.—Foot-hills near Denver, *Coulter*.

PENTSTEMON ACUMINATUS, Dougl. *Gr. Rev. l. c.*, p. 61. Glabrous and glaucous, 6'-18' high; radical leaves spatulate, cauline lanceolate, oblong or ovate-lanceolate, or the upper ones subcordate, rigid, glaucous; thyrsus elongated, many-flowered, often secund; sepals either ovate or lanceolate, acute or acuminate; corolla 6"-10" long, blue or purple, tube gradually dilated upward, lobes rounded, flat, spreading; capsule very sharply acuminate.—*Hall & Harbour*, 386; *Parry*. Near Denver, *Dr. Smith*. Colorado Springs, *Porter*. *B. H. Smith*. Monument Park and Clear Creek Cañon, *Coulter*.

PENTSTEMON SECUNDIFLORUS, Benth. *DC. Prod.*, 10, p. 325. Glabrous, pale, and somewhat glaucous, 12'-30' high; radical leaves petioled, elliptic-spatulate or narrowly-lanceolate, obtuse or acute, upper ones lanceolate or linear-lanceolate, sessile, middle ones 3'-4' long, erect; thyrsus elongated, narrow, 6'-9' long, interrupted; cymes secund, few-many-flowered; segments of the calyx oval-oblong, acute or acutish; with membranous margins; tube of the corolla more or less abruptly amplified below the middle; anthers glabrous or very minutely puberulent; sterile filament dilated at the apex, not bearded, (bearded, Benth.)—This species is merged by *Dr. Gray* into the preceding one, *Rev. Pentst.*, p. 62, but it seems to maintain its distinctive characters well. It is extremely abundant on the plains and at lower elevations in the mountains.—Cañon City, *Brandege*. Denver, *Dr. Smith*. Georgetown, *B. H. Smith*. Colorado Springs, *Porter*. Monument Park, *Canby*.

PENTSTEMON AMBIGUUS, Torr. *Gr. Rev. l. c.*, p. 64. Glabrous, 10-20" high, paniculately branching from a ligneous base; lower leaves linear, attenuated at base; upper ones subulate-filiform or acerose-subulate; racemes loosely-flowered; corolla 5"-8" long, tube 6", often incurved, scarcely dilated above, with the spreading limb, 6" in diameter; sterile filament glabrous.—Southeastern Colorado, *F. R. Diefenderfer*.

PENTSTEMON CÆSPITOSUS, Nutt. *Gr. Rev. l. c.*, p. 66. Grayish puberulent, depressed, branching from the base; branches crowded, short, 2'-6' long, decumbent or ascending, very leafy to the apex; leaves 3'-12" long, lanceolate or linear-spatulate, acute or submucronate, veinless, entire; peduncles axillary, short, secund, at length decurved, spreading, with 2 leafy bracts at the apex and 1-3 flowers ascending on short pedicels; sepals linear-lanceolate, rather broader and scarious-margined at the base; corolla 6"-9" long, bluish-purple, tubular, somewhat dilated above and biplicate; limb shortly bilabiate, with nearly equal lobes; sterile filament long-bearded.—Middle elevations. *Hall & Harbour*, 393; Middle Park, *Parry*. South Park, *Porter*. Taylor River, *Coulter*. Cañon City, *Brandege*. *Canby*.

PENTSTEMON ALBIDUS, Nutt. *Gen.* 2, p. 53. Stem puberulent, 6'-9' high; lower leaves petioled, oblong, obtuse, subentire, upper serrate, lanceolate, glabrous or puberulent; thyrsus oblong, subverticillately-

interrupted; cymes subsessile, few-flowered; segments of the calyx lanceolate, pubescent; tube of the corolla widened above, $\frac{3}{4}$ ' long, less ventricose than in *P. cristata*; beard of the sterile filament rather short, somewhat interrupted.—“Plains; flowers white,” *Hall & Harbour*, 380.

PENTSTEMON CRISTATUS, Nutt. *Gr. Rev. l. c.*, p. 67. Viscid-pubescent; lower leaves oblanceolate, petioled, upper ones oblong-lanceolate, sessile, clasping, entire or denticulate; panicle strict, with short, appressed, 3-4-flowered peduncles; sepals linear-lanceolate, attenuate, very hirsute; corolla 1' long, violet, broadly funnel form above the calyx, somewhat bilabiate, the lower lips and sterile filament strongly bearded with long hairs; anthers glabrous, expanding.—Cañon City, *Brandegee*. Pueblo, *Greene*. The specimens differ from the typical form in having much narrower, sometimes almost linear leaves.

PENTSTEMON PUBESCENS, *Soland.*, var. **GRACILIS**, Gr. (*P. gracilis*, Nutt.) *Gray's Rev. l. c.*, p. 69. Nearly glabrous; cauline leaves and thyrsus narrowed; corolla usually more slender, not bearded.—Cañon City, *Brandegee*. Colorado Springs and South Park, *Porter*. Monument Park, *Coulter*.

PENTSTEMON HUMILIS, Nutt. *Gr. Rev., l. c.*, p. 69. Glabrous below and somewhat glaucous, minutely viscid-pubescent above, 3'-10' high; lower leaves spatulate or oblanceolate, the upper oblong or linear-oblong, sessile and clasping; all acute or acuminate, usually entire, occasionally somewhat serrulate; peduncles rather short, appressed, 2-8-flowered; sepals ovate-lanceolate, with usually a slender herbaceous recurved acumination; corollas 4"-8" long, deep blue, dilating upwards, somewhat bilabiate, throat open and without folds; anthers glabrous, expanding; sterile filament yellow-bearded.—“Low mountains; an early species,” *Hall & Harbour*, 387. Plains of the Platte, *Dr. Smith*. Clear Creek Cañon, *Coulter*. Cañon City, *Brandegee*.

PENTSTEMON GLAUCUS, Gr. *Gr. Rev., l. c.*, p. 70. Glabrous except the viscid-pubescent inflorescence, $\frac{1}{2}$ "-1 $\frac{1}{2}$ " high; leaves subglaucous, denticulate or entire; radical ones subovate, petioled, the upper oblong-lanceolate, dilated and clasping at the base; thyrses subcompact; sepals ovate-lanceolate; corolla 1' long, widely and abruptly ventricose above the base, the throat open and without folds, the lower lip slightly longer and sparingly villous with long hairs, violet or lilac color; anthers glabrous and expanding; sterile filament yellow-bearded. *South Park*

VAR. **STENOSEPALUS**, Gr. Sepals lanceolate with a long slender acumination; thyrses short.—*Hall & Harbour*, 399. Sangre de Cristo Pass, *Brandegee*. Mount Lincoln, at 13,000 feet altitude, *Coulter*.

PENTSTEMON HALLII, Gr. *Gr. Rev., l. c.*, p. 70. Stems numerous from a creeping root-stock, 3'-5' high, glabrous except the inflorescence which under the microscope is very minutely glandulose; leaves very entire, pale, glaucous, linear-spatulate or linear, radical and lower cauline ones attenuated at the base, 1'-2' long, including the petiole, 1 $\frac{1}{2}$ "-4" wide; thyrses or simple racemes 4-10-flowered; pedicels short; sepals ovate or oblong, with broad, often erose, scarious margins; corolla 7"-9" long, inflated, ventricose-campanulate from a very short base, bluish-purple, lips short, about equal in length, upper one almost 2-lobed to the middle, lower 3-lobed, glabrous within; beard of the sterile filament short.—*Hall & Harbour*, 388. Wet Mountain Valley, *Brandegee*. Horse Shoe Mountain, at 11,000 feet altitude, *Coulter*. *Gray's Peak*, *Redfield*.

PENTSTEMON HARBOURII, Gr. *Gr. Rev., l. c.*, p. 71. Stems many from a slender, creeping root-stock, low, 2'-4' long, pruinose-puberulent even

to the top, leafy; leaves uniform, almost glabrous, thickish, obovate or oblong, very obtuse, very entire or repand; pedicels short, alternate, viscous-pubescent, as well as the calyx; sepals ovate, shortly acuminate or broadly lanceolate, margins not scarious; corolla purple, 7"-9" long; tube cylindraceous, limb shortly 2-lipped, upper lip deeply 2-lobed, lower lip deeply 3-lobed, with a hispid beard in the throat; sterile filament dilated at the apex and bearded downwards; capsule scarce exceeding the calyx.—"Mount Breckenridge on Blue River, west of the main range, in the high alpine region near perpetual snow," *Hall & Harbour*, 396. *Brandegee*.

PENTSTEMON CONFERTUS, Dougl. *Gr. Rev.*, l. c., p. 72. Very glabrous, erect, 1^o-1½^o high; lower leaves oblong-lanceolate, petioled, the upper sessile and lanceolate or somewhat ovate, all entire; flowers densely clustered in an interrupted spike, the upper cymes nearly sessile, crowded, often reflexed; sepals broadly lanceolate or ovate, margins white-scarious or erose-dentate or lacinate, acute or produced into a long green acumination; corolla 5"-6" long, sulphur-yellow, narrow, somewhat bilabiate; sterile filament bearded.

Var. **CÆRULEO-PURPUREUS**, Gr. Stems 6"-2^o high; corolla deep bluish-purple.—*Hall & Harbour*, 391. Twin Lakes, *Porter*. *Brandegee*; *B. H. Smith*. Abundant throughout the mountains in damp places. Mount Lincoln, at 13,000 feet altitude, *Coulter*.

CHIONOPHILA¹ **JAMESII**, Benth. Low, glabrous, from a thick root-stock; stem scape-form, 1'-4' high, with a pair of leaves above the middle, terminated by a crowded spike of flowers; radical leaves tapering into the expanded membranaceous, hyaline bases, spatulate or oblong-linear, obtuse, very entire, thickish; flowers 2-4, crowded; bracts opposite ovate, connate at base, obtuse or acute, unequal, flower in the axil of the larger one which nearly equals its tube; flowers yellowish, on very short pedicels; calyx 4"-5" long, campanulate, teeth broad, obtuse; corolla a little longer, lower lip densely tomentose within.—Plant dries black.—*Hall & Harbour*, 397. "High alpine, Pike's Peak," *Meehan*. Mount Lincoln, at 13,000 feet altitude, *Coulter*.

MIMULUS LUTEUS, L. *DC. Prod.* 10, p. 370. Smooth or viscid-puberulent, ascending or erect, 2'-4^o high; leaves numerous, erose-dentate or denticulate, orbiculate, ovate, or suboblong, the lower long-petioled and often sublyrate, the upper sessile or cordate-amplexicaul, about 7-nerved, shorter than the peduncles; calyx ovate, becoming inflated in fruit, with ovate teeth, the upper one largest; tube of the dilated yellow corolla twice longer than the calyx, the lower lip bearded.—Very common in damp spots at middle elevations.—*Hall & Harbour*, 398; *Brandegee*; *Porter*; *Coulter*.

MIMULUS JAMESII, Torr., var. **FREMONTII**, Benth. Pedicel slender, longer than the leaf; flowers smaller.—*Hall & Harbour*, 399. Cherry Creek, near Denver, *Dr. Smith*.

MIMULUS FLORIBUNDUS, Gr. *DC. Prod.* 10, p. 372. Viscidly-pilose; stem slender, 2'-18' long, diffusely branching at the base, ascending; leaves petioled, 3'-18' long, ovate, dentate, or denticulate, lower subcordate, somewhat pinnately 5-7 nerved; peduncles axillary to nearly

¹**CHIONOPHILA**, Benth. in *DC. Prod.* 10, p. 1, 331. Calyx large, membranous, 4-5 toothed, the fifth tooth smaller. Tube of the corolla scarcely exsert; lips short, broad, upper one emarginate, somewhat concave, lower spreading, short-trifid. Fertile stamens 4, declined at base, at length ascending; anthers glabrous; cells confluent; filament of the fifth stamen sterile, scarcely shorter than the others. Apex of the style slightly stigmatose. Ovaries numerous in each cell.

every leaf, solitary, slender, mostly longer than the leaves; calyx ovate, 5-angled, with very short, subequal teeth, becoming much dilated; corolla yellow, 3"-4" long, twice longer than the calyx.—*Hall & Harbour*, 400. Upper Arkansas, *Porter*. Grand Cañon of the Arkansas, *Brandegee*.

MIMULUS RUBELLUS, Gr. *Bot. Mex. Bound.*, p. 116. Annual, dwarf, $\frac{1}{2}$ '-3' high, glabrous or viscid-puberulent; stem erect, simple or much branched; leaves 2'-6" long, obovate or spatulate, narrowly oblong or lanceolate or linear, 3-5 nerved, mostly entire, sessile and narrowed at base or the lower short-petioled, about equaling the peduncles; calyx oblong, 1'-2" long, becoming somewhat dilated, the mouth squarely truncate, with short equal teeth; corolla yellow, red or purple, small and scarcely exerted or 2-3 times longer than the calyx and the dilated limb.—"Sub-alpine; scarce." *Hall & Harbour*, 401.

GRATIOLA VIRGINIANA, L.—Platte River, *Coulter*.

LIMOSELLA AQUATICA, L.—"Low mountains," *Hall & Harbour*, 80; *Brandegee*; *Canby*.

SYNTHYRIS PLANTAGINEA, Benth. *DC. Prod.*, 10, p. 455. Woolly-pubescent, becoming smooth; radical leaves oblong, crenate, thick, coriaceous, 3'-6" long, 2'-3 $\frac{1}{2}$ ' broad, abruptly narrowed at base and somewhat decurrent on the petiole; petioles 2'-3' long, somewhat pilose on the veins and ribs; scape 6'-12' high, furnished with numerous oblong or orbicular, nearly sessile bracts; flowers in a long, dense spike, in fruit 6' in length; fruit scarcely exceeding the round, ovate, persistent bracts.—*Hall & Harbour*, 405; *Canby*. Chiann Cañon, Ute Pass, and South Park, *Porter*. Este's Park, *Coulter*. At lower elevations.

SYNTHYRIS ALPINA, Gr. *Sill. Jour.*, (*N. S.*), 33, p. 125. Somewhat woolly, becoming smooth; radical leaves elliptic or oval, sometimes subcordate, closely crenate, 1'-2', on slender petioles; scape 2'-6' high, leafy-bracted; spike short, dense, in flower 9"-12" long; sepals lanceolate, villous on the outside toward the edge with long hairs as well as the bracts; corolla 2-parted, upper lip very broad, erose, lower much smaller, 2-3-parted, lobes narrow, purplish-blue; stigma capitate; stamens exsert.—High alpine.—*Parry*, 255. Gray's Peak, *Dr. Smith*; *Meehan*. Chicago Lakes, at 13,000 feet altitude, *Coulter*. *Redfield*.

VERONICA AMERICANA, Schwein.—*Hall & Harbour*, 408; *Dr. Smith*; *Porter*; *Meehan*; *Coulter*.

VERONICA ALPINA, L.—*Hall & Harbour*, 407; *Meehan*; *Brandegee*. Mount Lincoln, at 14,000 feet altitude, *Coulter*.

VERONICA SERPYLLIFOLIA, L.—*Hall & Harbour*, 406; *Meehan*. Clear Creek Cañon, at 9,000 feet altitude, *Coulter*.

VERONICA PEREGRINA, L.—Monument Park, *Coulter*.

GERARDIA TENUIFOLIA, Vahl. Branches slender, erect, strict, crowded.—Near Denver, *Dr. Smith*. Clear Creek, below Golden City, *Greene*.

CASTILLEJA LINARLEFOLIA, Benth. *DC. Prod.*, 10, p. 532. *Gray's Rev. Sill. Jour.*, (*N. S.*), 34, p. 335. Very glabrous, smooth or loosely woolly-pubescent above; stems 2'-4' high from a woody base, simple or branched, somewhat glaucous, shining, rarely pubescent throughout; leaves 1'-3' long, occasionally 3'-4' broad, 1-nerved or more or less 3-nerved at base, linear, entire or often 3-cleft or parted, narrowed at base, floral ones scarlet-colored and acute; spike interrupted; flowers sessile or on short peduncles; calyx incurved, $\frac{1}{2}$ '-1' long, deeply cleft anteriorly, sub-

ulately 4-toothed at the apex, mostly exceeding the bracts, colored; corolla 1'-2' long, nearly glabrous, bright scarlet; lobes of the lower lip linear-subulate, the yellow galea usually 1' or more in length or sometimes scarcely exsert.—Cañon City, *Brandegee*. Twin Lakes, *Porter* and *Coulter*. Sangre de Cristo Range, *Redfield*. *Clear Creek*

CASTILLEIA BREVIFLORA, Gray (*non* Benth.) *Gr. Rev. l. c.*, p. 238. (*Euchroma breviflora*, Nutt.) Low, subvillous or subcinereous, 3'-6' high, branched from the base; leaves mostly 3-5 cleft with linear lobes, the floral ones not dilated or colored; spikes dense, scarcely 1' long in flower; calyx equally cleft or moderately cleft in front, segments deeply bifid, obovoid-oblong, lobes lanceolate; tube of the yellow corolla nearly included, lower lip tri-saccate, carinate, shortly 3-cleft, lobes oblong, obtuse. Alpine.—*Hall & Harbour*, 409; *Parry*, 1872. Gray's Peak, *Dr. Smith*.

CASTILLEIA PARVIPLORA, Bong. *Gr. Rev. l. c.*, p. 336. Perennial, pilose-pubescent and hirsute throughout, scarcely hispid; stems 3'-20' high, usually numerous, simple or branched; the lower leaves usually entire and linear, upper ones 3-cleft or laeviniately-pinnate, the floral ones more or less dilated and nearly always colored, color deep red, flesh-color, yellow, or rarely green; calyx deeply cleft both above and below; the segments either emarginately 2-lobed or deeply bifid; lip of the corolla very short, galea scarcely exceeding the calyx or exserted, 5''-6'' long. Sangre de Cristo Pass, *Brandegee*. North Park, *Hayden*.

CASTILLEIA INTEGRÁ, *Gr. Rev. l. c.*, p. 338. Loosely tomentose; stems numerous from one root, erect, 6'-15' high, usually branched above; leaves linear or lance-linear, all very entire, 1½'-2' in length, whitish-tomentose, widely spreading, the floral ones somewhat lobed, rarely trifid, much enlarged and bright scarlet above; flowers 1½' long; segments of the calyx mostly bifid; galea exserted.—The most abundant species on the plains and in the mountains as far west as the Snowy Range. *Hall & Harbour*, 410. Denver, *Dr. Smith*. Clear Creek Cañon, Pleasant Park, and Monument Park, *Coulter*. Colorado Springs and Twin Lakes, *Porter*.

CASTILLEIA PALLIDA, Kunth. *Gr. Rev. c.*, p. 337.—Subalpine. Cañon City, *Brandegee*. Clear Creek Cañon and Weston's Pass, *Coulter*. *Hall & Harbour*, 412.

VAR. *MINIATA*, *Gr. Rev. l. c.*, p. 337. (*C. miniata*, Dougl.) Greener, glabrous below, taller, 1°-2° high; floral leaves dull red; galea usually much exserted.—*Hall & Harbour*, 411. The most common form at middle elevations. Cañon City, *Brandegee*. Gunnison River, East River, Sierra Madre Range, and South Park, *Coulter*. *Meehan*. North Park, *Hayden*. Denver, *Dr. Smith*; *B. H. Smith*. *Canby*. Ute Pass and Twin Lakes, *Porter*.

VAR. *ALPINA*, *Porter*. Woolly-pubescent, 2' high, few-flowered; flowers almost concealed in the broad uncolored floral leaves.—High alpine. Summit of Pike's Peak, *Porter*. Mount Lincoln, at 12,000 feet altitude, *Coulter*.

*ORTHOCAARPUS*¹ *LUTEUS*, Nutt. *DC. Prod.*, 10, p. 536. Stem hard, his

¹ *ORTHOCAARPUS*, Nutt. Calyx tubular-campanulate, membranous at base, usually sub-equally 4-cleft or 4-toothed. Corolla-tube slender; galea erect, entire, channeled, the margin inflexed; lower lip shorter, 3-plicate or 3-saccate, sub-entire at the apex or with three erect teeth. Stamens with one anther-cell fixed by the middle, the other pendulous, smaller or wanting. Capsule loculicidal. Seeds usually numerous and small, with a loose, reticulated or pitted testa, the radicle usually pointing toward the hilum.

pid, erect, 2'-15' high, simple or branched above, branches strict; leaves linear-lanceolate, entire or trifid; spike elongated, leafy, somewhat interrupted; bracts oblong or ovate, entire or 3-lobed, rarely 5-lobed, segments acute or acutish; calyx 3'-4' long with short lanceolate, acute teeth a little shorter than the tube; corolla yellow, pubescent, 6' long, little exceeding the bracts; capsule 3' long, obtuse, many-seeded; seeds small.—*Hall & Harbour*, 413. Cañon City, *Brandegee*. South Park, *Porter*. North Park, *Hayden*. *Canby*. Taylor River, *Coulter*.

RHINANTHUS CRISTA-GALLI, L.—*Hall & Harbour*, 422. *Hoopes*.

PEDICULARIS CANADENSIS, L.—"In the mountains at middle elevations," *Hall & Harbour*, 416. South Park, *Porter*. Platte River, *Coulter*. Wet Mountain Valley, *Redfield*.

PEDICULARIS GREENLANDICA, Retz. *DC. Prod.*, 10, p. 566. Erect, 1°-2° high, glabrous; stem simple, leafy; leaves pinnately-parted, segments lanceolate-linear, serrate; spikes elongated, 3'-8' long, many-flowered; calyx 2'-3' long, tubular, 5-toothed, the upper tooth smallest, the lateral ones with very shallow sinuses; galea of the reddish corolla arched, exceeding the calyx, produced into an elongated, subulate beak, twice longer than the calyx, nearly straight or more usually becoming strongly recurved upward and almost circinate.—*Hall & Harbour*, 419; *Parry*; *Canby*. Georgetown, *Dr. Smith*. Cañon City, *Brandegee*. Mount Lincoln, at 12,000 feet altitude, *Coulter*.

PEDICULARIS BRACTEOSA, Benth. *DC. Prod.*, 10, p. 574. Glabrous or scantily pilose upon the spike; stem erect, 1°-2° high, leafy; leaves pinnately-parted, segments lanceolate, incisely-deutate or pinnatifid; spike pedunculate, elongated, 2'-8' long, densely flowered; the bracts ovate, acuminate and somewhat membranous; calyx-lobes lanceolate, setaceous; galea of the yellow corolla slightly incurved, not beaked, hooded at the apex and terminating in an obtuse, somewhat 2-toothed projection; lip much shorter.—*Hall & Harbour*, 417; *Parry*.

PEDICULARIS RACEMOSA, Dougl. *DC. Prod.*, 10, p. 580. Glabrous; stems numerous, simple or occasionally branched above, ascending, 1°-2° high, leafy; leaves short-petioled, 1½'-4' long, narrowly lanceolate, doubly serrate with minute teeth; flowers axillary, in a loose, leafy raceme; calyx cleft above, 2-toothed; galea of the ochroleucous corolla arched, beak long, subulate, incurved.—"Subalpine; common in pine woods." *Hall & Harbour*, 414; *Parry*. Mount La Plata, at 11,000 feet altitude, and Horse Shoe Mountain, *Coulter*.

PEDICULARIS CRENULATA, Benth. *DC. Prod.*, 10, p. 568. Pubescent; stems erect, simple 6'-12' high; leaves all linear-oblong, obtuse, doubly crenate, 9"-15' long; spikes short, densely flowered; calyx cleft on the upper side, minutely 2-3-toothed; galea hooded, subincurved, 2-toothed under the apex.—*Ute Pass*, *Porter*. Cañon City, *Brandegee*. *Canby*. Horse Shoe Mountain at 11,000 feet altitude, *Coulter*. South Park, *Hall & Harbour*, 415.

PEDICULARIS PARRYI, Gr. *Sill. Jour. (N. S.)* 33, p. 250. Very smooth except the ciliated bracts; stem 6'-1° high, more or less bracted; leaves linear-lanceolate, pectinate-pinnatifid, petioled, cauline ones small, segments linear, acute, about 3' long, cartilaginous-serrate; bracts small, trifid; flowers numerous, short-pedicelled, somewhat crowded in a narrow spike, 1'-2' long, of a dirty or faded yellow; calyx membranaceous, marked with 5-striae, at length subinflated, teeth 5, short, lanceolate, very entire, lanulose within; galea narrow, apex incurved, gradually produced into a longish, emarginate beak which is somewhat decurved,

much surpassing the lower lip; filaments very smooth.—*Hall & Harbour*, 420; *Parry*, 251. Cañon City, *Brandegee*. Mount Lincoln, at 12,000 feet altitude, and Weston's Pass, *Coulter*.

PEDICULARIS SUDETICA, Willd. *DC. Prod.*, 10, p. 568. Erect, simple, 8'-12' high, glabrous except the spike; lower leaves pinnately-parted, narrowly lanceolate in outline; segments lanceolate, subincised-serrate and crenate, upper ones pinnatifid; spike short, densely hirsute-woolly; calyx 5-toothed, teeth entire or the lateral denticulate; galea of the reddish-purple corolla arcuate, scarcely hooded, shortly and broadly substrate; 2-toothed under the apex.

Var. Differs from the typical form in the smoother spikes and the lack of teeth on the tip of the galea.—*Hall & Harbour*, 421; *Parry*, 253. South Park and Mount Lincoln, *Coulter*.

PEDICULARIS PROCERA, Gr. Stem $1\frac{1}{2}$ °-3° high, stout leafy, bearing above a dense-flowered, softly pubescent spike 9'-18' long; leaves glabrous, pinnately-parted, segments lanceolate, lacinate-pinnatifid, lobes serrate or incised, radical ones 1° - $1\frac{1}{2}$ ° long; bracts elongated, linear from an ovate-lanceolate base, lower ones pectinate-pinnatifid, exceeding the flowers; calyx about equally 5-cleft, lobes lanceolate, entire, about half shorter than the tube; corolla 1' or more long, striate, dirty-green; galea hooded at the apex, not beaked, truncate, 2-toothed, scarcely equaling the shortly 3-lobed, somewhat spreading lip.—*Hall & Harbour*, 418; *Parry*, 252; *Brandegee*. Weston's Pass, *Coulter*. *Pikes Peak*

VERBENACEÆ. *Trinidad, Cuzco*

VERBENA HASTATA, L.—Cañon City, *Brandegee*.

VERBENA BRACTEOSA, Mx.—Plains of the Platte, *Coulter*. Colorado Springs, *Porter*.

VERBENA AUBLETIA, L.—Plains near Denver and Saint Vrain River, *Coulter*.

VERBENA STRICTA, Vent.—Common on the Arkansas at Pueblo, *Greene*.

LIPPIA LANCEOLATA, Mx.—Purgatory River, *Dr. Bell*. Eastern Colorado, *Porter*.

LABIATÆ.

TEUCRIUM CANADENSE, L.—Cañon City, *Brandegee*.

TEUCRIUM LACINIATUM, Torr. *Ann. N. Y. Lyc.*, 2, p. 251. Perennial; stem suffrutescent, branched, smooth; leaves opposite, lower ones pinnately 5-parted, sessile, segments linear, rather obtuse, nearly smooth, minutely reticulate, upper ones trifid, cuneate at base; flowers axillary, solitary, on pedicels about 2" long, large in proportion to the plant; calyx subcampanulate, 5-cleft, smooth; segments lanceolate, acute, lowest one 2-cleft or 3-toothed; stamens exserted, anthers roundish; nutlets destitute of longitudinal, thickened ribs.—Afterward referred by Dr. Torrey to *T. Cubense*, L., from which it is shown by Dr. Gray to be clearly distinct. *Proc. Amer. Acad.*, May, 1872, 8, p. 372.—Pueblo County, 1873, *Greene*.

MENTHA CANADENSIS, L., var. **GLABRATA**, Benth.—Near Denver, *Dr. Smith*. *Hall & Harbour*, 425. Mountains west of Denver, *Porter* and *Coulter*. *Cuzco*

LYCOPUS SINUATUS, Ell. Gray in *Proc. Am. Acad.*, Dec. 1870, 8, p. 286.

(*L. Europæus*, L., var. *sinuatus*, Gr. Manual, p. 346).—Cañon City, *Brandegee*.

RYCANTHEMUM LANCEOLATUM, Pursh.—Near Denver, *Dr. Smith*.

CALAMINTHA CLINOPODIUM, Benth.—Sierra Madre Range, at 10,000 feet altitude, *Coulter*.

HEDEOMA HISPIDA, Pursh.—*Hall & Harbour*, 423. (*H. hirta*, Nutt.)

HEDEOMA DRUMMONDII, Benth. *DC. Prod.*, 12, 245. Gray in *Proc. Am. Acad.*, May, 1872, 8, p. 367. Annual, cinereous-puberulent or pubescent, 4'-6' high, branched from the base; leaves oval, oblong, or the upper ones linear, obtuse, very entire, sessile or narrowed at the base into a petiole; whorls few-flowered; calyx ovate, tubular, hispid, scarcely 2-lipped, teeth all subulate-setaceous, connivent, erect after flowering and more or less curved upward, lower ones twice longer than the upper, more or less shorter than the corolla.—*Hall & Harbour*, 424. Purgatory River, *Dr. Bell, Meehan*.

HEDEOMA PIPERITA, Benth. *Gray, l. c.*, p. 366. Cinereous-pubescent or puberulent; leaves ovate, obtuse, usually rounded at the base, uppermost floral ones sometimes oblong, petiolate; whorls loose, few-many-flowered; calyx oblong-tubular, gibbous, hirsute, 2-lipped, upper lip spreading, with subulate teeth, the lower with longer, more setaceous erect teeth, about equaling the corolla.—Bluffs of the Arkansas near Pueblo, 1873, *Greene*.

SALVIA LANCEOLATA, Willd. (*S. trichostemumoides*, Pursh.) Canescently pubescent; stems 3'-15' high, herbaceous, ascending, branched; leaves lanceolate or oblong-linear, 1'-2' long, rather obtuse or acuminate, narrowed at the base into a long slender petiole, sparsely and obtusely serrulate in the middle; bracts subulate, a little longer than the short pedicels; raceme simple, 2'-4' long, whorls about 2-flowered, all remote; calyx tubular, striate, puberulent, enlarged in fruit, inflated at the base, teeth acute; corolla blue, a little longer than the calyx, and with it 4' long; style short-bearded.—*Hall & Harbour*, 426. Near Denver, *Dr. Smith*. Plains around Colorado Springs, *Porter; Meehan*.

SALVIA PITCHERI, Torr. *DC. Prod.*, 12, p. 302. Tomentose-pubescent or canescent; stem herbaceous, 1½'-2' high, erect, simple or branching above; leaves oblong-lanceolate, or linear, acute, subserrate, narrowed at the base, but scarcely petioled, somewhat tomentose beneath, smoother above; raceme simple, elongated, (6') whorls distant, 6-15-flowered; bracts lance-linear, much longer than the pedicels and often equaling the calyx; calyx subsessile, tubular, striate, villose, teeth 3, broad, obtuse; corolla twice or more longer than the calyx, pubescent on the outside; style bearded.—*Hall & Harbour*, 427. Eastern Colorado, *Porter; Dr. Smith*.

MONARDA ARISTATA, Nutt. *DC. Prod.*, 12, p. 363. Canescent, 1' high, with numerous spreading branches; leaves linear or oblong-lanceolate, narrowed at the base, sharply and remotely serrate, floral ones and outer bracts sessile, somewhat colored, tipped with a long subulate awn; whorls many-flowered, compact, remote; calyx striate, pubescent, bearded in the throat, teeth nearly equal, long, subulate, pilose, penicillate at the apex; tube of the corolla scarcely longer than the calyx-teeth.—Plains and base of the foot-hills, *Hall & Harbour*, 428. Colorado Springs, *Porter*. Near Denver, *B. H. Smith*. Plains of the Platte, *Coulter*. Wet Mountain Valley, *Redfield*.

MONARDA PISTULOSA, L. Very common along streams on the plains

and extending into the mountains. Colorado Springs and Denver, *Porter*. Cañon City, *Brandegee*. *B. H. Smith*; *Dr. Smith*.

MONARDA PUNCTATA, L.—Foot-hills west of Denver, *Dr. Smith*.

MONARDELLA¹ ODORATISSIMA, Benth. *DC. Prod.*, 12, p. 190. Stems numerous, from a woody base, procumbent, 6'–10' high; leaves subsessile, oblong-lanceolate, 6"–12" long, very entire, or with a few denticulations, acute at each end; hoary, or at length becoming green; heads of flowers 9"–12" in diameter; outer bracts broadly ovate, very obtuse, colored, equaling the elongated tubular calyces; lobes of the rose-colored corolla oblong-linear, 3" long; calyx-teeth and margins of the bracts softly villose.—Gothic Mountain, August, *Coulter*.

LOPHANTHUS URTICIFOLIUS, Benth. *DC. Prod.*, 12, p. 368. Glabrous, erect, 2^o–4^o high; leaves cordate-ovate, crenate or serrate, green upon both sides, obtuse or the uppermost acute, the floral ones sessile, ovate and acute; bracts few, lanceolate or lance-linear, shorter than the calyx; spikes dense, oblong, 2'–4' long; calyx 2'–4' long, incurved, glabrous or puberulent, the throat oblique, the membranous teeth colored, long-subulate-acuminate, the upper ones longest; corolla purple, short-exserted, the throat slightly inflated and limb short; stamens much exserted.—Sieta Madre Range, *Coulter*.

LOPHANTHUS ANISATUS, Benth.—*Hall & Harbour*, 429. Plains near Denver, *Coulter*.

DRACOCEPHALUM PARVIFLORUM, Benth.—*Hall & Harbour*, 430. Twin Lakes, *Coulter*. Upper Arkansas, *Porter*. Georgetown, *Dr. Smith*. Cañon of the Arkansas, *Redfield*.

BRUNELLA VULGARIS, L. Cañon City, *Brandegee*; *Redfield*.

SCUTELLARIA RESINOSA, Torr. *DC. Prod.*, 12, p. 427. Minutely glandular pubescent or puberulent, much branched from the base, 2'–12' high; leaves $\frac{1}{2}$ '–1' long, short-petioled, broadly ovate, obtuse, entire or crenate, rounded or cuneate at base, floral ones similar; flowers axillary, opposite, secund, very variable in size; corolla blue, 2"–1' long, densely villose, attenuate at base, usually more than four times longer than the herbaceous calyx.—*Hall & Harbour*, 431. Near Denver, *Dr. Smith*. South Park, *Porter*. Cañon City, *Brandegee*. Bear Creek, Clear Creek and Saint Vrain River, *Coulter*.

SCUTELLARIA GALERICULATA, L.—Near Denver, *Dr. Smith*. Cañon City, *Brandegee*. *Hall & Harbour*, 432.

STACHYS PALUSTRIS, L., var. CORDATA Gr. (*S. cordata*, Ridd.) Near Denver, *Dr. Smith*. Cañon City, *Brandegee*. *Mechan*. Near Colorado Springs, *Porter*. Plains of the Platte, *Coulter*; *Redfield*.

BORRAGINACEÆ.

ONOSMODIUM CAROLINIANUM, DC.—Near Denver, *Dr. Smith*. Cañon City, *Brandegee*. Plains of the Platte, *Coulter*.

LITHOSPERMUM ANGUSTIFOLIUM, Mx. (Including *L. longiflorum*, Spreng.) The latter, according to M. E. Bebb, *Am. Nat.* 7, p. 691, is only

¹MONARDELLA, Benth. Calyx tubular, often elongated, 10–13-nerved, 5-toothed; teeth short, nearly equal, straight, throat naked within; corolla-tube equaling the calyx or slightly exserted, the throat glabrous within; somewhat bilabiate, the upper lip 2-cleft, the lower 3-cleft, and the lobes all oblong or linear, flat and nearly equal. Stamens 4, somewhat equal, or the lower ones longer, straight, divergent, and exserted. Anthers with two parallel cells, becoming divergent or divaricate. Styles very shortly 2-cleft. Nutlets dry.

the spring-state of the former with larger flowers and greatly elongated corolla tubes.—Cañon City, *Brandegee*. *Meehan*. Clear Creek, *Coulter*.

LITHOSPERMUM HIRTUM, Lehm.—Near Denver, *Dr Smith*.

LITHOSPERMUM PILOSUM, Nutt. Watson in *King's Rep.*, vol. 5, p. 238. Stems slender, branched, 1°-1½° high, strict, numerous from a perennial root, hirsute, sulcate; leaves broadly linear or linear-oblong, 1'-2' long, sub-acute, sessile, strigose and somewhat hispid; spikes very leafy, elongated in fruit; flowers nearly sessile, yellow, 6' long, tube much exceeding the linear sepals; calyx 5-parted, hirsute, lobes unequal, linear; nutlets 1½" long, smooth and shining.—*Hall & Harbour*, 441. *Parry*, 293. Near Denver, *Dr. Smith*; *B. H. Smith*. Bear Creek, Pleasant Park, and Clear Creek Cañon, *Coulter*.

MERTENSIA PANICULATA, Don.—Cañon City, *Brandegee*; *Parry*.

MERTENSIA SIBIRICA, Don. *Gr. Rev. Mert. Sil. Jour.*, (N. S.,) 34, p. 340. Glaucescent, glabrous or subpubescent, 1°-5° high; cauline leaves ovate or ovate-lanceolate, or often oblong-lanceolate, acute or acuminate, mostly sessile or very short petioled; calyx 5-parted, the lobes oblong or oblong-linear, ciliate, obtuse, 2-4 times shorter than the corolla-tube, which is sparingly hairy or nearly glabrous within; corolla 4'-6' in length, limb 5-cleft, more than half longer than the tube; filaments dilated, shorter than the anthers.—*Hall & Harbour*, 442. Chicago Lakes, at 11,000 feet altitude, *Coulter*. Wet Mountain Valley, *Brandegee*. Twin Lakes, *Porter*. *Dr Smith*. Banks of mountain-streams; variable.

MERTENSIA ALPINA, Don. *Gr. Rev. l. c.*, p. 340. Glabrous or hirsute, 6'-12" high; leaves spatulate-oblong, lanceolate or the uppermost oblong-ovate, rather small and mostly acute; calyx-segments ovate or oblong-lanceolate and obtusish or linear-lanceolate and acute, ciliate, a little shorter than the corolla-tube which equals the limb and is usually hairy within; anthers inserted in the throat.—Common on the plains and in the mountains, and very variable. *Hall & Harbour*, 444 and 445. Colorado Springs and South Park, *Porter*. Cañon City and Wet Mountain Valley, *Brandegee*. Near Denver, *Dr. Smith* and *B. H. Smith*. *Canby*. Horse Shoe Mountain, at 11,000 feet altitude, *Gray's Peak*, at 12,000 feet, *Mount Lincoln*, at 13,000 feet, and Clear Creek Cañon, at 9,000 feet, *Coulter*.

MERTENSIA BREVISTYLA, Watson. *King's Rep.*, vol. 5, p. 239. t. 23. Low, 4'-10' high, pubescent with short, appressed, rigid hairs, the lower surface of the leaves excepted; leaves oblong or oblong-lanceolate or oblanceolate, very obtuse; flowers in a loose panicle; calyx deeply 5-cleft or 5-parted, very hirsute, lobes oblong or ovate-lanceolate, usually acute; corolla-tube short, but little exceeding the calyx and rarely as long as the deep blue limb; anthers inserted near the base of the tube and included within it; style very short.—*Hall & Harbour*, 443.

ERITRICHUM¹ VILLOSUM, DC. *Prodr.*, 10, p. 126. Stems 3'-6' high,

¹ERITRICHUM, Schrad. Calyx 5-parted. Corolla salverform, the throat closed by small obtuse scales. Stamens and style included. Nutlets 4, attached laterally, (usually near the base) the surface of insertion very narrow, imperforate at base, flat (or convex) anteriorly, the angles smooth or rarely crenate.—Mostly annual, with entire and commonly alternate leaves, the usually very small blue or white flowers in lateral or axillary spicate racemes. Differing from *Mgusotis* in the quinquecuneal aestivation of the corolla and the more or less lateral insertion of the nutlets, which are also usually rugose or granulate upon the back, and from *Echinopspermum* in the attachment of the nutlets (in most cases) not extending above the middle of the style, the nutlets not dilated below, prickles rare and not barbed, and the attachment of the seed ventral and not at the apex.—*DC. Prodr.*

loosely branched from the base and caespitose, rooting below, the flowering shoots elongated, leafy, erect, pubescent; leaves elliptic-oblong, acute, sparingly villous with long silky hairs; racemes in pairs, erect, several-flowered, bracteate at base; nutlets with inflexed, ciliate teeth on the margins.

Var. *ARETIODES*, Hook. Densely caespitose, 3'-2' high, covered with soft silky hairs; leaves densely imbricated below, elliptical-lanceolate, acute; racemes few-flowered, short-exserted; tube of the corolla scarcely exceeding the calyx, limb bright blue, 1'-3' in diameter; nutlets nearly 1' in length, concave on the back, the toothed margin conspicuous.—High alpine. *Hall & Harbour*, 440; *Parry*, 278. James' Peak, at 12,000 feet altitude, Chicago Lakes, at 13,000 feet, and Mount Lincoln, at 14,000 feet, *Coulter*. Sangre de Cristo Pass, *Brandegee*. *Meehan*. Gray's Peak, at 12-13,000 feet altitude, *Redfield*.

ERITRICHIUM ANGUSTIFOLIUM, Torr., *Pacif. R. R. Surv.*, 5, p. 363. Annual, very hispid, with spreading hairs; stem 3'-1' high, suberect, widely branched; leaves linear; racemes terminating the branches, usually forked and at length elongated; flowers sessile, bractless; calyx 2'-3' long in fruit, very hispid with yellowish hairs, lobes lanceolate-linear; corolla white, 6'-12' long, falling early; stamens inserted near the base on very short filaments; nutlets 1-4, oblong, acute, 1' long, convex and minutely papillose on the back, attached to the style to the middle by a ventral groove.—Near Denver and Colorado Springs, *Porter*.

ERITRICHIUM CRASSISEPALUM, T. & G. *Pacif. R. R. Surv.*, 2, p. 171. Annual, very hispid, with spreading hairs; stem much branched from the base, branches ascending, 3'-5' high; leaves obovate-lanceolate, rather obtuse; racemes bracteate except the upper portion; fractiferous calyx ventricose at base, closed and contracted above the middle, the segments thickened and indurated on the back, finely pilose on the margins, with large, strong, hispid hairs on the back; nutlets heteromorphic, ovate, convex on the back, 3 of them muriculate-granulate, the 4th larger and nearly or quite glabrous.—*Hall & Harbour*, 434. Denver and Colorado Springs, *Porter*. Cañon City, *Brandegee*.

ERITRICHIUM GLOMERATUM, DC., *Prod.* 10, p. 131. Perennial or biennial; stem simple, erect, 6'-18' high, usually solitary and rather stout and rigid, very hirsute with spreading hairs, leafy especially at base; leaves 2'-4' long, alternate, oblong or linear-spatulate or oblanceolate, sub-acute, hirsute and usually more or less appressed, pubescent; spikelets 5-9 flowered, lateral axillary, clustered, more or less peduncled, and usually bifurcated, and the upper ones sessile; flowers 2'-4' long, nearly sessile; calyx very hispid, 5-parted, the linear-lanceolate lobes equaling the corolla-tube, much enlarged in fruit; limb of the white corolla broad and expanded, truncated scales of the throat conspicuous; nutlets large, 1½' long, ovate and narrowed above, but obtuse, more or less rugose and tuberculated on the back, which is surrounded by an acute, slightly raised margin, sulcate ventrally and attached to the elongated style to the middle.—*Hall & Harbour*, 438 in part. Colorado Springs, *Porter*.

Var. *VIRGATUM*, *Porter*, (*E. virgatum*, *Porter*, *Hayden's Rep.*, 1870, p. 479.) Stout; stem erect, 2'-3' high, very hispid; inflorescence much elongated, virgate, spike-like, 1'-2' in length; cymes many, conglomerated, few-flowered, lower ones short-peduncled, upper ones sessile, very much shorter than the long, spreading, bracteal leaves, which become narrowly linear above.—This variety is very common on the plains at

the base of the mountains and among the foot-hills.—Colorado Springs, Monument Park, and Ute Pass, *Porter*. Clear Creek Cañon, *Coulter*.

ERITRICHIMUM JAMESII, Torr., (*Myosotis suffruticosa*, Torr. in *Ann. N. Y. Lyc.* 2, p. 225.) Hirsute, much branched from a suffruticose base; branches 6'-10' high; leaves linear-lanceolate, tapering to the base, 1'-2' long; spikes terminal, numerous; flowers on very short pedicels; calyx campanulate, at first scarcely longer than the tube of the corolla, but in fruit elongated and closed, segments ovate; corolla ochroleucous, tube shorter than the calyx-teeth, spreading limb 2'-3" wide, lobes very obtuse; nutlets 4, similar, depressed, conniving at the top, but separated at the sides, very convex and smooth on the back, shining, edges very acute, ventral suture adhering to the style above the middle.—*Hall & Harbour*, 435. Plains near Denver, *Dr. Smith*. Colorado Springs, *Porter*. Cañon City, *Brandege*. *Meek*. Plains of the Platte, *Coulter*.

ECHINOSPERMUM DEFLEXUM, Lehm., var., *FLORIBUNDUM*, Watson. (*E. floribundum*, Lehm.) Biennial; stem erect, 2°-4° high, fistulous, branched, villous with spreading hairs; leaves oblong-lanceolate, obtuse or acute, ciliate at base, hirsute-pubescent; racemes erect, spreading, bifid, bracteolate, with deflexed pedicels; calyx-lobes ovate, shorter than the bluish or white corolla; nutlets compressed, with a single marginal row of barbed prickles which are connate at base, the dorsal surface granulate or shortly pilose or nearly smooth. Near Denver, *Dr. Smith*. Plains of the Platte, *Coulter*. Wet Mountain Valley, *Brandege*. Colorado Springs, *Porter*. *B. H. Smith*.

ECHINOSPERMUM REDOWSKII, Lehm.—Near Denver, *Dr. Smith*; *B. H. Smith*. Cañon City, *Brandege*. Abundant on the plains, *Porter*; *Coulter*.

HELIOTROPIMUM CURASSAVICUM, L.—*Hall & Harbour*, 192.

HELIOTROPIMUM CONVULVULACEUM, Gr. Canescent with appressed scabrous pubescence, branching from a suffruticose base, branches weak and spreading, 6'-9' high; leaves ovate and lance-ovate, 9'-1' long, ciliate on the margins, petioles short, about 3' long; flowers scattered along the leafy branches, short-peduncled; calyx-lobes subulate; corolla salver-form, tube 3'-4" in length, narrow, spreading limb 6'-9" long, somewhat 5-angled, throat naked; nutlets 4, approximate in pairs, angled, oblique, hairy, adnate to the style.—*Hall & Harbour*, 436.

HYDROPHYLLACEÆ.

HYDROPHYLLUM VIRGINICUM, L. Mountains west of Denver, *Dr. Smith*. Cañon City, *Brandege*. Clear Creek Cañon at 9,000 feet altitude, *Coulter*; *Redfield*.

ELLISIA NYCTELEA, L.—Cañon City, *Brandege*.

PHACELIA CIRCINATA, Jacq. *DC. Prod.* 9, p. 298. Perennial, hispid; stems erect or ascending, 6'-20' high, branching or subsimple; leaves petioled, 1'-3' long, simple or pinnate, the 3-5 leaflets distinct or the uppermost confluent, terminal one much larger, ovate to narrow-lanceolate, acute, entire, or obscurely serrulate, usually strongly nerved, on the upper side the appressed strigose hairs between the nerves, on the lower side chiefly upon the nerves; racemes densely many-flowered, strongly circinate; calyx-lobes oblong or linear, erect, acute; corolla blue or nearly white, 2'-3" long, somewhat exceeding the calyx; stamens exserted; filaments hairy; capsule 2' long, very hispid with

erect hairs, shorter than the calyx; seeds often solitary, deeply pitted.—*Hall & Harbour*, 439. Georgetown, *Dr. Smith*. Denver, *Porter*. Plains of the Platte, *Coulter*.

PHACELIA INTEGRIFOLIA, Torr. *DC. Prod.*, 9, p. 299. Annual, erect, 4'-15' high, branching above and sometimes at the base, viscidly glandular pubescent; leaves 1'-2' long, varying from oblong to ovate, cordate or truncate at base, simple or crenately-dentate or doubly serrate, or sometimes more or less deeply pinnatifid, and the segments often toothed, the upper at times nearly sessile; sepals ovate, ciliate-hispid and glandular; corolla-segments oblong, the appendages short and encircling the base of the filaments; stamens exerted, naked; style united to the middle; ovary oblong, hairy; capsule globose, minutely pubescent and glandular, equaling or slightly exceeding the calyx; seeds 4, minutely warted on the back and transversely ridged on the face.—*Southeastern Colorado*, *F. R. Diefenderfer*.

PHACELIA POPEI, Torr. & Gr. *Pacif. R. R. Surv.* 2, p. 172, t. 10. Viscidly pubescent, hispidulous with spreading hairs; stems 4'-1° high, branching from a biennial root; leaves bipinnately parted or pinnately cut, 2'-4' long, segments pinnatifid, 3"-10' long, or the lower ones reduced in size, lobes 5-9, short, obtuse; spikes corymbose, densely-flowered; segments of the calyx spatulate, about half the length of the white campanulate corolla and a little longer than the globose capsule; stamens at length much exerted; filaments naked; seeds 4, oval, with the inner face strongly bilanate, the central keel very prominent, pitted, 1½" long.—*Hall & Harbour*, 446. Near Denver, *Coulter*. Gray's Peak, *Dr. Smith*.

PHACELIA TANACETIFOLIA, Benth. *DC. Prod.* 9, p. 299. Annual, 3'-2° high, suberect; branches lax and slender, more or less scabrous-pubescent, or the stem and branches glabrate; leaves variable, 2'-6' long, 1-2-pinnatifid, the 3-7 pairs of segments oblong and incised dentate; calyx-lobes linear or lanceolate, usually dilated and foliaceous above, very pilose, especially on the margins; corolla campanulate, 3' long, scarcely exceeding the calyx, the appendages small, and encircling the filaments; style hairy at base, bifurcate to below the middle; ovary hairy, 4-ovuled; capsule 2' long, ovate, acute, pubescent; seeds 1½" long, pitted.—*Wet Mountain Valley*, *Brandege*. South Park, *Coulter*.

PHACELIA NEO-MEXICANA, Thurber., *Bot. Mex. Bound. Surv.*, p. 143. Stem erect, 1°-2° high, hispidly-pilose and viscidly-pubescent; leaves pinnatisect, 3'-4' long, thin, the segments rather distant and unequal, about 1' long, incised-dentate, lobes ovate, subdentate, mostly obtuse; racemes spike-form, densely-flowered, corymbose; flowers subsessile; calyx not enlarged in fruit, lobes oblong; corolla scarce twice longer than the calyx, small, campanulate, margin minutely crose-dentate; stamens scarcely exerted; filaments smooth; style cleft to the middle, hairy below; capsule globose-ovate, 3" long; seeds very minutely pitted, nearly 3' in length.—*Plains of the Platte*, *Coulter*. Garden of the Gods, *Porter*.

PHACELIA SERICEA, Gr. (*Eutoca sericea*, Grah. *DC. Prod.*, 9, p. 294.) Perennial, canescent with a somewhat silky pubescence appressed upon the leaves; stems 6'-2° high, rather stout, simple, terminating in a narrow, compound raceme; leaves mostly oblong, 2'-3' long, incised-pinnatifid, segments coarsely cut or entire, petioles hispid-ciliate; racemes mostly short-peduncled, ½-1' long in fruit, forming a compound raceme, 3'-12' in length; calyx-lobes linear, exceeding the pedicels, shorter than the corolla which is 3' long, campanulate, blue or rarely white,

persistent, the appendages conspicuous, nearly as long as the tube and distinct from the filaments; stamens 3 times longer than the corolla, the anthers small and roundish; style bifid at the apex; capsule pubescent, ovate-oblong, acute, 3" long, about 16-seeded; seeds pitted.—*Hall & Harbour*, 447. Sangre de Cristo Range, *Brandegee*. Gray's Peak, *Dr. Smith*. Clear Creek Cañon, *Coulter*; *Redfield*.

NAMA DICHOTOMA, Ruiz & Pav. *Gray in Proc. Am. Acad.*, 8, p. 283. More or less viscosely pubescent; corolla not, or but little, surpassing the leaves; capsule ovate or short-oblong; seeds strongly rugose-pitted, $\frac{1}{2}$ "– $\frac{1}{2}$ " long, oval-oblong.

VAR. ANGUSTIFOLIA, Gray, *l. c.*, p. 284. Leaves linear-lanceolate.—S. Colorado, *Hayden*; *Hoopes*.

POLEMONIACEÆ.

PHLOX CANESCENS, T. & G. *Gr. Rev. Polemon. Proc. Amer. Acad.*, Dec., 1870, v. 8, p. 253. Dwarf and matted-cæspitose, with a woody, perennial, much-branched base which is usually covered with the dead leaves of previous seasons; the branchlets densely leafy up to the solitary, sessile flowers, woolly-canescens; leaves 3"–4" long, evergreen, rigid, subulate, more or less acerose, scarious-connate at base, usually strongly revolute on the margin, soon spreading or somewhat squarrose-recurved from the appressed base; tube of the white corolla exceeding the calyx, the ovate lobes entire or emarginate, 3"–4" long; ovules solitary.—Cañon City, *Brandegee*.

PHLOX CÆSPITOSA, Nutt. *Gr. Rev. l. c.*, 253. Dwarf, densely or rather loosely cæspitose; leaves rigid, linear-subulate, or oblong-linear, 4"–6" long, pungent, hispid on the thickened, somewhat revolute margins, otherwise smooth or sparingly glandular; corolla-tube more or less exceeding the calyx, lobes ovate, entire, 3" long.

VAR. CONDENSATA, Gr. Densely cæspitose, 1½"–2' high; leaves short, 2"–3" long, very closely crowded, erect, imbricated.—Gray's Peak, at 13,000 feet altitude, *Coulter*. *Hall & Harbour*; *Parry*.

PHLOX DOUGLASHII, Hook. *Gr. Rev. l. c.*, 254. Cæspitose, very much branched, pubescent or smoothish; leaves rather rigid, acerose, usually spreading, less crowded; margins naked or somewhat hirsute-ciliate at base; flowers subsessile; corolla purple or white, tube exceeding the calyx, lobes ovate, entire, 3" long.—*Hall & Harbour*, 453.

PHLOX LONGIFOLIA, Nutt. *Gr. Rev. l. c.*, 255. Perennial, woody only at the base, glabrous or pubescent; stems erect or ascending; leaves slightly rigid, not fasciated, linear or very narrowly linear, sometimes lanceolate, 1'–3' long; flowers solitary or subcymose, long-peduncled; corolla white or pink, tube longer than the narrow, subulate calyx-teeth; style elongated and often equaling the tube.—Near Long's Peak, *Coulter*. Sangre de Cristo Range, *Brandegee*.

COLLOMIA² LINEARIS, Nutt. *Gr. Rev. l. c.*, 259. Annual, more or less

¹NAMA, L. Calyx 5 sepaled, persistent. Corolla tubular-funnel-form. Stamens sub-included. Styles 2, with rather obtuse stigmas. Capsule 2-celled, loculicidal, the septum bearing two laminar placentæ projecting into each cell from the axis, which are at first united, at length free.—Low, annual branching herbs, perennial or somewhat woody at the base, variously pubescent, with alternate or rarely opposite entire leaves, and axillary and terminal flowers.—*Choisy, DC. Prod.*, 10, p. 182.

²COLLOMIA, Nutt. Corolla tubular-funnel-form or salver-form, with a more or less dilated throat. Filaments slender, unequally inserted, usually protruded. Ovules solitary, few or many in each cell. Seed-coat developing mucilage and projecting spiral threads (spiricles) when wetted, (except in *C. gracilis*).—Annuals or semi-biennials, with alternate leaves, which are usually pinnately incised or divided, and with clustered or sometimes scattered flowers.

viscid-pubescent, becoming glabrate below, glandular above; stems erect, simple or branching, 6'-18' high; leaves sessile, lanceolate, very entire; heads crowded; lobes of the calyx triangular-lanceolate, acute; corolla light blue or nearly white, 6' long, slender, but little enlarged at the throat, the limb small; ovules solitary; seeds with very numerous spiracles.—*Hall & Harbour*, 404. Cañon City, *Brandegee*. Monument Park and plains of the Platte, *Coulter*.

COLLOMIA GRACILIS, Dougl. *Gr. Rec. l. c.*, 259. Annual, viscid-pubescent, at length much branched and spreading, 2'-6' high; leaves sessile, lanceolate or linear or the lowest oval or obovate, entire; flowers rather loosely cymose or scattered; calyx rounded at the base and nearly 5-parted, with linear-subulate segments; corolla 5' long, purple or violet, nearly salver-form, the narrow tube yellowish and seldom exceeding the calyx; seeds without spiracles.—*Hall & Harbour*, 403. Plains near Denver, *Coulter*.

COLLOMIA LONGIFLORA, Gr. *Gr. Rec. l. c.*, 261. Annual, very smooth, erect, 6'-2' high, much branched, paniculately ramose, loosely flowered; peduncles 1-flowered, generally slender, subcorymbose; leaves apiculate, pinnately 3-7-parted, segments linear or almost filiform; lobes of the calyx shorter than the tube, subulate; corolla white, salver-form, tube very long, 9'-18', not widened above, lobes orbicular or ovate, sometimes apiculate at the apex; filaments included, sometimes 2-3 unequally inserted at the throat; anthers oblong, cells about 10-12-ovaled.—On the plains around Denver, *Dr. Smith*. Colorado Springs, *Porter*. Cañon City, *Brandegee*.

GILIA¹ NUDICAULIS, Gr. *Gr. Rec. l. c.*, 266. Annual, very glabrous, 1'-4' high; stem leafless from the cotyledons to the capitate inflorescence which is subtended by an involucre of several ovate-lanceolate or lanceolate, sessile, entire, foliaceous bracts, from whose axils sometimes 1 or 2 smaller heads are produced on short peduncles; corolla white, pink or yellow, salver-form, tube 2'-3' long, slender, exceeding the calyx, the cuneate lobes 1'-2' long, somewhat undulate-toothed or decidedly 1-3 dentate at the broad apex; anthers sessile in the somewhat dilated throat, short, included; ovaries numerous.—South Park, *Hall*.

GILIA NUTTALLII, Gr. *Gr. Rec. l. c.*, 267. Puberulent; stems numerous from a perennial woody base, slender, simple or loosely branched, 8'-12' high; leaves opposite, mostly shorter than the internodes, palmately-parted into 3-7 narrow-linear, mucronate or acerose segments, 6'-9' long; flowers crowded into a leafy cluster; corolla white with a yellow throat, fragrant, salver-form, with a short dilated funnel-form throat, the tube puberulent, scarce exceeding the narrow calyx; filaments short, inserted in the throat, scarcely exerted; anthers ovate oblong; cells 2-ovuled. Figured by Watson, *King's, Rep.*, vol. 5, Pl. 25.—Near Mount Lincoln, *Coulter*.

GILIA PUNGENS, Benth. *Gr. Rec. l. c.*, 268. Viscid-pubescent, puberulent or glabrate, much branched from woody stems; leaves alternate, short, erect or a little spreading, rigid, fasciated in the axils, palmately 3-7-parted, segments entire and with the calyx-lobes acerose or subulate and pungent; flowers solitary or few in a terminal cluster; corolla pink, white or yellow, salver-form, tube at length longer than the calyx, the

¹*GILIA*, Ruiz. & Pav. Corolla from salver-form or funnel-form to campanulate or rotate. Stamens equally inserted in or below the throat or sinuses of the corolla and mostly equal; filaments not declined, naked (rarely pubescent) at the base. Ovules sometimes solitary, commonly few or many in each cell. Seed-coat (with few exceptions) developing mucilage or spiracles when wetted.—Herbs, or in a few cases, suffruticose; leaves, &c., various.

wedge-obovate lobes 2"-4" long; anthers in the somewhat funnel-form throat oblong, cells 8-10 ovuled; seed-coat close, without mucilage or spiracles.—*Hall & Harbour*, 463. Near Denver, *Dr. Smith*. Upper Arkansas, *Porter*. *B. H. Smith*. Cañon City, *Brandegee*. Twin Lakes, *Coulter*.

GILIA MINIMA, Gr. *Gr. Rev. l. c.*, 269. Low, $\frac{1}{2}$ '-1' high, simple or branched, smoothish; leaves pinnately divided with the acerose, spinescent segments widely divaricate; bracts densely crowded, almost hiding the small white flowers, nearly glabrous; calyx slightly hairy in the sinuses, teeth unequal, entire or two of them somewhat divided; corolla $1\frac{1}{2}$ " long, about equaling the calyx tube; stamens shorter than the corolla-lobes; cells 1-3 ovuled, 1-seeded.—*Colorado*, *Vasey*.

GILIA SPICATA, Nutt. *Gr. Rev. l. c.*, 273. Perennial; stem stout, erect, 4'-10' high, bearing many heads crowded in a long virgate interrupted leafy spike, densely woolly-tomentose; leaves trifid or very entire, scarcely pointed, alternate, becoming smooth; lobes of the corolla oblong-ovate, shorter than the more or less exerted tube; anthers sessile in the throat, cells 4-6-ovuled.—*Hall & Harbour*, 460. Northern Colorado, *Hayden*.

VAR. *CAPITATA*, Gr. Smaller; leaves very entire; flowers in a single terminal head. *Hall & Harbour*, 461. Weston's Pass, at 11,000 feet altitude, *Coulter*.

GILIA CONGESTA, Hook. *Gr. Rev. l. c.*, 274. Perennial, more or less woolly-pubescent, bearing single, terminal or few corymbose and close heads; stems 3'-12' high; leaves very entire or 3-7 pinnately-parted, with 3-7 narrowly-linear segments, divisions aristulate-mucronate; corolla salver-form, white, the tube about equaling the oval lobes, not exceeding the usually awned calyx-segments; filaments inserted in the sinuses, equaling or exceeding the anthers; cells 2-4-ovuled.—*South Park*, *Canby*. *Gray's Peak*, *B. H. Smith*. *Hoope's*.

GILIA AGGREGATA, Spreng. *Gr. Rev. l. c.*, 275. Biennial, more or less pubescent; stems 1°-4° high, less leafy above and loosely branching; leaves alternate, pinnately-parted, with linear, mucronate-apiculate segments; panicle contracted into a virgate spike or loose with open branches; calyx usually glandular, lobes subulate; corolla deep scarlet, varying to light pink or even white or variegated and spotted, tubular-funnel-form, 6"-20" long, with ovate or lanceolate-acute, widely spreading or soon recurved lobes; filaments either exerted or included; anthers oval or short-oblong; ovules numerous; seeds mucilaginous and spiraliferous.—Very common on the plains on dry slopes and among the foot-hills up to an elevation of 9,000 feet.—*Hall & Harbour* 459; *Parry*; *Dr. Smith*; *B. H. Smith*; *Canby*. *North Park*, *Hayden*. *Porter*; *Coulter*.

GILIA PINNATIFIDA, Nutt. *Gr. Rev. l. c.*, 276. Minutely viscid-glandular, especially above; stem 6"-2° high; leaves pinnately pinnatifid, narrowly lanceolate in outline, lobes uniform, oblong, 3" long, curved upward, apiculate, rarely cleft; panicle ample, thyrsoid or sometimes widely spreading and corymbose; bracts linear or subulate, few; corolla salver-form, white or bluish, tube about twice longer than the calyx, a little longer than its obovate lobes; filaments inserted beneath the sinuses, much exerted; anthers ovate; cells 6-8 ovuled; seeds neither mucilaginous nor spiraliferous.—*Hall & Harbour*, 456. *South Park*, *Canby*. Common on the plains around Denver, *Dr. Smith*. *Colorado Springs*, *Porter*. *Cañon City*, *Brandegee*. *B. H. Smith*. *Pleasant Park* and *La Plata Mountain*, at 11,000 feet altitude, *Coulter*.

GILIA INCONSPICUA, Dougl. *Gr. Rev. l. c.*, 278. Annual, erect, 4'-12' high, glabrate or viscid-glandular and pubescent, branched and loosely paniced; leaves alternate, the lower 1-2 pinnatifid or pinnate-toothed; flowers scattered, on slender pedicels, purple or blue, rarely white, 3'-5' long, funnel-form, with the throat more or less dilated, 2-3 times the length of the calyx, the tube little or not at all exerted, the lobes ovate or obovate, mostly exceeding the stamens; filaments slender; cells many ovuled; very variable.—Cañon City, *Brandegee*. *Hall & Harbour*, 457.

POLEMONIUM CONFERTUM, Gr. *Gr. Rev. l. c.*, 280. Perennial, 6'-8' high, glandular-viscid and musk-scented, woolly-pubescent above; leaflets very numerous, small, 1'-4' long, mostly as if whorled or fasciated, being 2-5 divided and sessile, segments either broadly oval or linear-oblong; flowers capitate-crowded, at length racemose-spicate, somewhat nodding, honey-scented; lobes of the calyx narrow, twice shorter than the cylindrical or oblong tube; corolla 8'-12' long, blue, the narrow funnel-form tube longer than the calyx and 2-3 times longer than its rounded lobes; filaments barely hairy and scarcely dilated at base.—*Hall & Harbour*, 450 and 451. Gray's Peak, at 12,000 feet altitude and Horse Shoe Mountain, at 11,000 feet, *Coulter*. *B. H. Smith*; *Redfield*.

Var. **MELLITUM**, Gr. Laxer in leaflets and inflorescence, with a pale or whitish corolla 1' long, the lobes one-fourth the length of the narrow tubes. Alpine, 2'-3' high.—*Hall & Harbour*. Sangre de Cristo Range, *Brandegee*.

POLEMONIUM VISCOSUM, Nutt. *Gr. Rev. l. c.*, 280. Low, 3'-4' high, pubescent and very viscid-glandular; leaflets very entire, ovate or rounded; flowers subcorymbose; calyx subcampanulate, lobes elongated-lanceolate, (broadish, *Gray*;) corolla-tube equalling the calyx, not exceeding its own lobes.—Gray's Peak, *B. H. Smith*.

POLEMONIUM CERULEUM, L.—*Hall & Harbour*, 449. Twin Lakes, *Coulter*; *Porter*.

Var. **FOLIOSISSIMUM**, Gr. *Gr. Rev. l. c.*, 281. Very viscid-pubescent; stems 2° high, with the corymbose branches very leafy to the top; leaflets often confluent on a wing-margined rachis; stamens and style mostly shorter than the smaller white or blue corolla, which is twice longer than the calyx.—*Hall & Harbour*, 448. Wet Mountain Valley, *Brandegee*. Plains of the Platte, *Coulter*. South Park, *Porter*. *W. D. Parry*.

POLEMONIUM HUMILE, Willd. (*P. pulchellum*, Bunge.; *P. Richardsonii*, Gray.; *P. capitatum*, Benth.; *P. pulcherrimum*, Hook.) *Gr. Rev. l. c.*, 281. Dwarf, 4'-8' high, branching from the base, softly glandular-pubescent; stems 1-2 leaved; leaflets ovate or oblong-ovate, acute, small; flowers subcorymbose, few, on rather long, slender pedicels, small, blue, tube shorter than the calyx; calyx cleft below the middle; ovules 2-4; seeds 1-2 in each cell.—*Hall & Harbour*, 452; *Parry*. Wet Mountain Valley, *Brandegee*. Chicago Lakes, at 12,000 feet altitude, and Horse Shoe Mountain, at 11,000 feet, *Coulter*. Subalpine woods. *Benth. Parry*.

CONVOLVULACEÆ.

IPOMÆA LEPTOPHYLLA, Torr. in *Fremont*, 1st Rep., p. 94; *Emory's Rep.*, p. 148, t. 11. Annual (?), 2°-3° high, much branched from the base; branches long, spreading and prostrate, angular, glabrous; leaves linear and lanceolate-linear, attenuated at both ends, strongly veined, glabrous, mucronate-apiculate, short-petioled; peduncles 1-3-flowered,

$\frac{1}{2}$ - $1\frac{1}{2}$ ' in length; sepals appressed, broadly ovate, very obtuse, with a minute mucro, $5''$ long; corolla funnel-form, $2'$ - $2\frac{1}{2}'$ long, purple; stamens inserted near the base, filaments villous at the base, anthers oblong-linear, large; style as long as the stamens; stigma 2-lobed, lobes capitate; ovary 2-celled, with 2 ovules in each cell.—On the Platte near Denver and on the mesas around Colorado Springs, *Porter* and *Dr. Smith*.

CONVOLVULUS LOBATUS, Eng. & Gr. *Pl. Lindh.*, p. 44. (*C. hastatus*, Nutt. *Trans. Amer. Phil. Soc.*, (n. ser.,) 5, p. 194, non Thurb. *C. Nuttallii*, Torr. in *Emory's Rep.*, p. 149.) Root perennial; stem twining, herbaceous and pubescent; leaves petiolate, on either surface covered with a short hoary and silky pubescence, the primary ones simply hastate, the rest partly palmated, about $2'$ long, commonly producing on either side of the base two lateral, reflexed and toothed, or almost entire lobes, the central segment more than twice their length and double their breadth; peduncles solitary, mostly 2-flowered, much longer than the leaves, the pedicels each producing 2 bracts; segments of the 5-leaved calyx externally pubescent, imbricated, oval and obtuse, tinged with purple; corolla rose-colored; stigmas 2, filiform; capsule 2-celled, cells 2-seeded.—Cañon City, *Brandegee*.

CALYSTEGIA SEPIUM, R. Br.—Along the Platte near Denver and Colorado Springs, *Porter*. Pleasant Park, *Coulter*.

EVOLVULUS ARGENTEUS, Pursh.—*Hall & Harbour*, 579. Cañon City, *Brandegee*. Plains of the Platte, *Coulter*. Colorado Springs, *Porter*. *man-ble*

CUSCUTA ARVENSIS, Beyrich. *Eng. Monog., Trans. Saint Louis Acad.*, vol. 1, p. 494. Var. *pentagona*, Eng. *l. c.*, p. 494. Calyx thin and shining; lobes orbicular, as long or longer than the shallow tube of the corolla, forming, where they join, 5 projecting angles.—*Hall & Harbour*, 464.

CUSCUTA DECORA, Eng. *l. c.*, p. 501. On *Psoralea*, near Denver, *Dr. Smith*. Cañon City, *Brandegee*. Plains, *Porter*.

CUSCUTA GRONOVII, Willd. *Eng. l. c.*, p. 507.—Cañon City, *Brandegee*. Manitou Springs, *Porter*; climbing high on *Clematis ligusticifolia*. Foot of the Spanish Peaks, Huerfano County, *Greene*.

CUSCUTA CUSPIDATA, Eng. *l. c.*, p. 509. Inflorescence loosely paniculate, with many sterile hyaline bracts on the pedicels and at the base of the calyx; flowers pediceled, membranaceous, about $2''$ long; sepals free, imbricate, ovate or orbicular, cuspidate or sometimes obtuse, like the surrounding sterile bracts; ovary oval, with a thick stylopodium; capsule thick and glandless at the apex; seeds about $4''$ long, obovate, compressed, rostrate, with a very short oval, mostly transverse hilum; withered corolla covering the capsule like a hood.—*Parry*, 273.

SOLANACEÆ.

SOLANUM TRIFLORUM, Nutt. *Gen.* 1, p. 128. Stem unarmed, herbaceous, procumbent, hirsutulous; leaves petiolate, pinnatifid, segments acute, entire, or dentate, with broad sinuses; peduncles nearly opposite the leaves, 2-3-flowered; calyx about 5-parted, lobes linear-oblong; corolla small, white, with revolute lobes; berry globose, about the size of a cherry, when ripe blackish-brown.—Buffalo Peaks, *Coulter*. Colorado Springs, *Porter*. *Hall & Harbour*, 467. Denver, *Dr. Smith*. *Triflor*

SOLANUM NIGRUM, L.—Cañon City, *Brandegee*. *Greene*. *Triflor*

SOLANUM ROSTRATUM, Dunak. *DC. Prod.*, 13, p. 329. Stem herbaceous, 2° - 3° high, much-branched, armed with strong, straight, yellow

spines and pilose throughout with cinereous-stellate hairs; leaves petioled, spiny, obovate in outline, 2'-3' long, 5-7 lobed, lobes obovate, obtuse; racemes 2'-3' long, 5-8-flowered; peduncles 1' long; pedicels 3"-4" long, 1-flowered, longer in fruit; calyx villous, globose-cup-form, tube very spiny, longer spines 6" in length; corolla yellow, about 5-cleft, the lobes broadly ovate, acute, plicate; stamens 5, unequal; anthers declined, one much larger than the others, produced into a long curved beak; berry about 4-celled, included in the spiny calyx.—Common on the plains. *Hall & Harbour*, 465. Near Denver, *Dr. Smith*; *B. H. Smith*. Cañon City, *Brandegee*. *Porter*, Plains of the Platte, *Coulter*.

SOLANUM HETERODOXUM, Dunal. *DC. Prod.*, 13, p. 331. In most points like the preceding, but the leaves are smaller, less deeply lobed and on longer petioles; the yellow spines are shorter; flowers corymbosely clustered, 3-5; corolla blue, small, 5"-6" in diameter, plicate, hirsute-pubescent without, tube short, limb 5-cleft; stamens 5, unequal, half as long as the corolla; filaments short, smooth; berry globose, at first green, then black, 2-celled.—On the plains near Greeley, *Porter*.

PHYSALIS ANGULATA, L.—Cañon City, *Brandegee*. Denver, *Dr. Smith*.

PHYSALIS PUBESCENS, L.—Cañon City, *Brandegee*.

PHYSALIS VISCOSA, L.—Cañon City, *Brandegee*. Colorado Springs, *Porter*.

PHYSALIS PENNSYLVANICA, L., var. *LANCEOLATA*, Gr.—Plains of the Platte and Pleasant Park, *Coulter*. Cañon City, *Brandegee*. Denver, *Dr. Smith*. Ute Pass, *Porter*.

PHYSALIS LOBATA, Torr. *Ann. N. Y. Lyc.*, 2, p. 226. Much branched from the base; branches prostrate, decumbent or ascending, smooth, angular, often 12'-18' long; leaves oblong or ovate, irregularly lobed or repand, sometimes lyrate, lobes very obtuse, abruptly narrowed into a petiole, solitary or in pairs, nearly smooth; flowers solitary, nodding, on filiform peduncles about half as long as the leaves; calyx subcampanulate, with 5 acute lobes, minutely tomentose at the tips and margins, often covered as well as the pedicels with minute white granules, about 2½" in diameter; corolla campanulate-rotate, purple or ochroleucous, 9" in diameter; stamens 5, filaments shorter than the corolla, smooth. Fructiferous calyx much inflated and larger than the berry, 1' long and 1' wide.—*Hall & Harbour*, 466. Colorado Springs, *Porter*. Cañon City, *Brandegee*.

WITHANIA (?) *CORONOPUS*, Torr. *Bot. Mex. Bound.*, p. 155. (*Solanum Coronopus*, Dunal.) Annual, erect or spreading, branched above; leaves lanceolate or linear-lanceolate, sessile, tapering to the base, 1'-2' long, nearly entire, toothed or deeply pinnatifid; flowers solitary or in pairs on slender pedicels which are at length reflexed; corolla dull yellow, 5"-6" in diameter; fruit globose, size of a large pea, nearly white when mature, covered $\frac{2}{3}$ or more by the calyx.—Cañon City, *Brandegee*. Pueblo, *Greene*.

NICOTIANA ATTENUATA, Torr. "Annual, glutinous-pubescent or

¹*WITHANIA*, Prunopy. Calyx campanulate, 5-cleft; lobes subulate, inflated after flowering, more or less covering the berry. Corolla campanulate, funnel-form or subrotate, longer than the calyx, 5-cleft. Stamens 5, inserted on the tube of the corolla, equal or large; filaments subulate, often dilated at the base, naked or squamose; anthers yellow, oblong, equal to or shorter than the filaments. Ovary ovate-globose, smooth, closely surrounded at base by a thin glandless, annular disk, 2-celled. Placenta axillary to the dissepiment; ovules many. Style simple, straight, subulate, equal to the stamens or a little longer. Stigma capitate. Berry globose, 2-celled. Seeds many, subreniform. Embryo fleshy, subcircular. *DC. Prod.*, 13.

somewhat glabrate, erect, 1^o-3^o high, branched; leaves oblong lanceolate or the uppermost linear, acuminate, attenuate into a petiole, entire or obscurely repand-dentate; lower ones 4'-6' long and 1'-2' wide, the upper ones proportionately narrower; flowers in loose terminal racemes; calyx 3' long, tubular-campanulate, teeth short, triangular, acute, equal; corolla narrow funnel-form, 1' long, the short limbs spreading or more usually erect and closed; capsule 3'-5' long, exceeding the calyx, ovate, acute, 2-valved, valves bifid; seeds pitted. Watson in *King's Rep.*, vol. 5, p. 276, pl. 27.—Gray's Peak, *Dr. Smith.* *Joynton*

GENTIANACEÆ.

GENTIANA AMABELLA, L. *DC. Prod.*, 9, p. 95. (*G. acuta*, Mx.) Stem slender, erect, simple, or branched, 2'-10' high; lowest leaves oval-spatulate, upper ones ovate-lanceolate, sessile and sub-clasping, margins scabrous; cyme mostly compound, raceme-like; calyx 5-cleft, lobes lanceolate, somewhat unequal, shorter than the cylindrical tube of the corolla; corolla pale blue, without folds, fringed at the base of the limb, lobes elliptic-lanceolate, shorter than the tube; ovary oblong-linear, sessile.—*Hall & Harbour*, 473; *Parry*; *Canby*. Twin Lakes and Sierra Madre Range, *Coulter*. Subalpine.

VAR. *STRICTA*, Watson, (*G. acuta*, Mx. var. *stricta*, Griseb., *DC. Prod.*, 9, p. 96.) Stem 2^o-4^o high; cymes raceme-like, axillary, strict, elongated, erect; flowers when dried becoming yellow.—Mountains west of Denver, *B. H. Smith*. Wet Mountain Valley, *Brandegeë*.

GENTIANA HETEROSEPALA, Eng. *Trans. Saint Louis Acad.*, 1, p. 215. Annual, erect, simple, 4'-16' high, few-flowered, glabrous; lowest leaves obovate-spatulate, $\frac{1}{2}$ -1 $\frac{1}{2}$ ' long, upper ones ovate, broad at the base, sessile, acute or sub-obtuse, margin minutely scabrous; flowers solitary or fasciated in the axils, on peduncles of unequal length, (3'-18") pale blue, 6'-8' long; calyx 5-cleft, two of the lobes large, ovate, acute, nearly equalling the corolla, the rest shorter and linear-subulate; corolla sparingly-bearded, lobes linear-oblong, obtuse, spreading, half as long as the tube; anthers ovate-cordate; pistil linear.—Sierra Madre Range, *Coulter*.

GENTIANA DETONSA, Fries.—*Hall & Harbour*, 471. Wet Mountain Valley, *Brandegeë*. *B. H. Smith*. Mount Elbert, near Twin Lakes, at 10,000 feet altitude, *Coulter*. *Snow Park*, *in the Park*

GENTIANA BARBELLATA, Eng. in *Trans. l. c.*, 2, t. 11. Stems 1-3 from a perennial caudex, very smooth, 1-flowered, 2'-4' high; leaves fleshy, obtuse, with a very narrow, cartilaginous, crenulate margin, lowest linear-oblong or spatulate, attenuated into a petiole sheathing at the base, 1' long, cauline few, linear, connate at base, lower pair elongated, attenuate at base, the uppermost (2-4) broader at base, involucre-like below the sub-sessile flower, acute or acuminate; calyx 4-cleft, lobes triangular-lanceolate, scarcely longer than the tube, much exceeding the tube of the corolla, 2' long, outer ones a little broader, with a membranous margin, mostly dentate; lobes of the deep azure-blue corolla linear-oblong, obtuse, erect-spreading, with the margins short-ciliate half way up, dentate above, tube deeply campanulate, greenish-yellow within; lower-part of the purplish-brown filaments attached in the middle, the free edges beset with long and slender fringes, glands between the bases of the filaments conspicuous; ovary ovate, attenuate at base; stigma semi-orbiculate, sessile; seeds squamulose.—Mount Flora, in the Snowy Range, *Parry*. Sierra Madre Range, *Coulter*.

GENTIANA TENELLA, Fries. *DC. Prod.*, 9, p. 98. Stem branching at

base; pedicels 1-flowered, frequently 2' high; lowest leaves spatulate, upper ones few, oblong; calyx deeply 5-parted, segments mostly unequal, obtuse, at length shorter than the cylindrical tube of the corolla; lobes of the deep blue corolla, ovate, acutish, about equaling the tube.—Gray's Peak, *Greene*. August, 1872.

GENTIANA HUMILIS, Stev. *DC. Prod.*, 9, p. 106. Stems numerous, 1'-2' high, laxly branched from the base; branches 1-flowered; leaves smooth with white margins, more or less apiculate; lowest round-ovate, upper ones lance-oblong, at first crowded and imbricated on the stems; calyx 5-cleft; lobes ovate-lanceolate, erect, shorter than the scarcely enlarged tube of the corolla; corolla blue, lobes ovate, half the length of the tube; folds entire, rounded, a little shorter than the lobes; style none; capsule obovate or somewhat globose, attenuated at the base, rounded at the apex. Alpine—*Parry*. Long's Peak, at 9,000 feet altitude, June 2, *Coulter*.

GENTIANA PROSTRATA, Hænke. *DC. Prod.*, 9, p. 106. Var. *AMERICANA*, Engelm. Stems simple, 6"-2' high, slender; leaves oval-spatulate, mostly obtuse, not pointed, smooth on the margin; flowers small, 4-parted, deep blue; teeth of the calyx 5, erect, ovate-lanceolate, acute, shorter than the little-enlarged tube of the corolla; tube of the corolla twice longer than the ovate lobes, folds often more than half the length of the lobes, nearly entire; style short; capsule oblong-linear, base attenuated into a short stipe.—*Hall & Harbour*, 475; *Parry*.

GENTIANA FRIGIDA, Hænke. *DC. Prod.*, 9, p. 111. Perennial; stem often solitary, ascending; leaves spatulate-linear, obtuse, smooth on the margin; flowers sub-solitary, terminal; calyx 5-cleft, the lobes oblong-linear, half as long as the corolla; corolla plaited, glandless and beardless, narrowly obovate, whitish, with blue spots, lobes short, ovate, 3 times longer than the entire folds; anthers free; testa slightly winged; capsule at length stipitate.

Var. *ALGIDA*, Pall. Stem usually taller, with the flowers, from 1½'-8' high; leaves broader; flowers 1-3, pedicled, 1½'-2' long, more tinged with purple; calyx somewhat unequal and split; lobes of the corolla longer. High alpine.—*Hall & Harbour*, 472; *Parry*, 305. Summit of Pike's Peak, *Canby*. Gray's Peak, *Dr. Smith*; *B. H. Smith*. Mount La Plata, at 14,000 feet altitude, *Coulter*.

GENTIANA AFFINIS, Griseb. *DC. Prod.*, 9, p. 114. Perennial; stems clustered, ascending 8'-20' high; lower leaves obovate-oblong, obtuse, the upper lanceolate, rather acute, scabrous on the margins; flowers solitary and pedicled, or clustered and sub-sessile; calyx 5-cleft, lobes oblong-linear or sometimes dilated, very variable, often almost wanting, rarely all present; corolla blue, beardless and glandless, narrowly clavate, open, twice longer than the calyx, the lobes oblong, obtuse, thrice longer than the cleft folds; stigmas connate or twisted or diverging; anthers free; testa slightly winged; seeds orbicular or oblong, winged or wingless.—*Hall & Harbour*, 468 and 469. North Park, *Hayden*. *Parry*, 439; *Canby*; *Dr. Smith*; *B. H. Smith*. Wet Mountain Valley, *Brandegee*. Twin Lakes and Sierra Madre Range, *Coulter*.

GENTIANA PARRYI, Engelm. *Trans. Saint Louis Acad.*, 1, p. 218. Perennial; stems 1 or several, ascending or erect, 4'-9' high, simple, leafy, few-flowered; leaves somewhat glaucous, broad at base, sessile, rounded-ovate, ovate or ovate-lanceolate, 10"-15" long, 3"-10" wide, 3-nerved, the uppermost carinate and boat-shaped, involucrate to the large, sessile flowers which are 15"-18" long, very deep purple, greenish below, widening upward, with lobes a third as long as the tube; calyx 5-cleft,

membranous, entire, the lobes linear, shorter than the tube; tube of the open corolla obconic, twice longer than the calyx, the erect broadly obovate lobes very shortly acute; ovary lanceolate, stipitate. Subalpine.—*Hall & Harbour*, 470; *Parry; Canby*. Gray's Peak, *Dr. Smith; B. H. Smith*. North Park, *Hayden*. Twin Lakes, at 10,000 feet elevation, *Coulter*.

FRASERA SPECIOSA, Dougl. Biennial, stem stout, erect, 3^o-5^o high, strict, usually simple, glabrous, not sulcate; leaves in fours, thick, acutish or acute, 7-9 nerved, the lowest oblong-lanceolate, 6'-9' long, 2' wide, attenuate into a long petiole, the cauline connate at base, the uppermost linear; the racemose cyme densely-flowered, elongated; flowers 1' in diameter, the petals bearded at the base between the filaments; calyx-segments linear, acuminate, rather shorter than the whitish, punctate petals; glands in pairs, elliptic-oblong; filaments dilated at base, scarcely united; style about equaling the ovary.—*Hall & Harbour*, 553. Monument Park, *Coulter*. Ute Pass, *Porter*. Abundant at lower and middle elevations.

SWERTIA PERENNIS, L. *DC. Prod.*, 9, p. 132. Stems erect, 6'-20' high, few-many-flowered; lower leaves oblong-elliptic, long-petioled, cauline ones opposite, ovate-oblong, obtusish; flowers erect, 6^o-8^o in diameter, steel-blue, with darker spots; corolla-segments coriaceous, elliptic-oblong, acutish, twice longer than the lanceolate calyx-lobes; glands in pairs, orbicular, the fimbriate crest distinct; stigma reniform, sulcate; seeds winged.—*Hall & Harbour*, 476. Gray's Peak, *Dr. Smith. Parry; Canby*. Twin Lakes, at 10,000 feet altitude, *Coulter*.

PLEUROGYNE ROTATA, Griseb. *DC. Prod.*, 9, p. 122. Annual, simple, erect, 3'-6' high, bearing 1-few flowers at the summit; lowest leaves spatulate, the uppermost linear, obtuse; segments of the calyx lance-linear, equaling the corolla; ovary acute.—"South Park, subalpine." *Hall & Harbour*, 477.

APOCYNACEÆ.

APOCYNUM ANDROSÆMIFOLIUM, L.—Plains of the Platte, near Denver, *Dr. Smith and Coulter*.

APOCYNUM CANNABINUM, L.—Plains of the Platte, *Coulter*. Wet Mountain Valley, *Brandegeë. Meehan*.

ASCLEPIADACEÆ.

ASCLEPIAS SPECIOSA, Torr. *Ann. N. Y. Lyc.*, 2, p. 218. Tomentose, becoming glabrate; stem simple, 2^o-5^o high; leaves 4'-8' long, cordate-ovate, acute, short-petioled or the uppermost nearly sessile, abruptly apiculate; umbels axillary and terminal, solitary, many-flowered, the short peduncles and the pedicels often densely tomentose; flowers light purple; corolla-lobes ovate, acutish, reflexed; hoods of the crown 6' long, ovate, long-acuminate, bidentate at the base within, three longer than the stigma and the compressed, incurved horn; pods 4' long, 1' in diameter.—Plains near Denver, *B. H. Smith*. Colorado Springs, *Porter*. Plains of the Platte, *Coulter*.

¹*SWERTIA*, L. Flowers 5- (or sometimes 4-) merous. Calyx-segments united at the very base, valvate. Corolla withering, rotate, without cocoon or folds, glands fimbriate on the margin. Stamens inserted on the throat; filaments equal at base; anthers at length incumbent, nodding. Stigma terminal, seated on the ovary, continuous, emarginate-reniform. Capsule 1-celled, 2-valved, septical. Seeds numerous, attached to the valves.—*De Coudolle*.

²*PLEUROGYNE*, Escholtz. As in *Swerfia*, except that the two lateral stigmas are decurrent upon the margins of the valves and glandulose above.

ASCLEPIAS JAMESII, TOTT. *Bot. Mex. Bound.*, p. 162. Very smooth, somewhat glaucous; stem stout, 1°-2° high; leaves orbicular or orbicular-obovate, subcoriaceous, retuse or emarginate, cordate at the base, very short-petioled, 3'-4' long, 2½'-3½' wide, abruptly pointed; umbels many-flowered, short-peduncled; corolla greenish, segments broadly ovate; hoods purplish, dilated, obliquely-truncated; the horn with the acute point exerted and projected partly over the stigma; pods ovoid, smooth.—Cañon City, *Brandegee*.

ASCLEPIAS BRACHYSTEPHANA, Eng. *Bot. l. c.*, p. 163. Stem branching, 8'-12' high; leaves opposite, linear-lanceolate, abruptly narrowed at the base into a short petiole, gradually tapering to a long, narrow point, 3'-6' long; umbels 3-8; peduncles shorter than the pedicels, many-flowered; corolla dull-purple, segments ovate-oblong, reflexed; hoods broader than long, toothed on the inner margins; faleiform process vertical; pods oblong, smooth, 2' long, acuminate.—On the plains. *Hall & Harbour*, 478. *Denver & Harb.*

ASCLEPIAS GYALIFOLIA, Decaisne.—*Hall & Harbour*, 480. Cañon City, *Brandegee*. Upper Arkansas, *Porter*. Monument Park, *Coulter*.

ASCLEPIAS TUBEROSA, L.—Cañon City, *Brandegee*.

ASCLEPIAS VERTICILLATA, L.—Cañon City, *Brandegee*. Eastern Colorado, *Dr. Smith*.

Var. Dwarf, 4'-6' high, branched from the base; stems very leafy with crowded, filiform leaves; umbels corymbose at the summit.—*Hall & Harbour*, 481. A common form on the plains around Denver and Colorado Springs, *Porter*. Cañon City, *Brandegee*. *Dr. Smith*.

ACERTES DECUMBENS, Decaisne, *DC. Prod.*, 8, p. 552. Stems 1°-2° long, numerous, decumbent, sometimes angular; leaves scattered and subopposite, ovate-lanceolate, or more usually narrow-lanceolate, (6' long, ½'-1' wide,) acute, margins scabrous; umbels terminal, sub-globose; corolla-lobes ovate, greenish-yellow; hoods purple, equaling the lobes and exceeding the disk; pods smooth, 4' long, 1' in diameter.—S. Colorado, *Hoopes*. *Cañon City*

ACERATES VIRIDIFLORA, Ell.—Wet Mountain Valley, *Brandegee*.

ACERATES AURICULATA, Engelm. *Bot. Mex. Bound.*, p. 160. Stem erect, 2°-3° high, somewhat glaucous; leaves scattered, linear, filiform or narrowly linear, slightly scabrous but not revolute on the margins, 4'-6' long, less than 1' wide; umbels several, axillary, many-flowered, on short peduncles; pedicels 6' long, pilose; calyx villose on the outside; lobes of the corolla reflexed, 2½' long; hoods obscurely 3-toothed at the apex, involute on the margins, very broadly biauriculate at base, with large triangular wings; pods lanceolate, long-beaked, 3'-4' long.—Near Denver, *Dr. Smith*. Cañon City, *Brandegee*. Pueblo, *Redfield*.

JASMINEÆ.

MENODORA² SCABRA, Gt. *Sill. Jour.*, (2d. Series,) 14, p. 44. Stems erect,

¹JASMINEÆ, BROWN. Flowers perfect, regular; calyx persistent, dentate or lobed, lobes 5-8; corolla hypogonous, gamopetalous, 5-8 lobed, salver-form, lobes imbricate in aestivation, two exterior contorted or valvate; stamens 2, adnate to the tube and included, anthers 2-celled, cells dehiscing introrsely by a longitudinal chink; ovary destitute of a hypogonous disk, 2-celled, 2-lobed at the apex; ovules erect, 1 or 2 in each cell or rarely 2-4; style simple, stigma 2-lobed; fruit either two-berried or separable into two capsules; valves septiferous in the middle; seeds with little or no albumen; embryo straight; cotyledons two.

²MENODORA, H. & B. Calyx 10-14 lobed, rarely 7-9 lobed; lobes linear or setaceous, longer than the tube of the corolla. Corolla short-funneliform or subrotate, more or less bearded in the throat; limb 5-parted, lobes obovate or oblong, scarcely mucronulate; filaments filiform; anthers awnless.

mostly corymbose at the summit; lower leaves oblong-lanceolate, upper ones linear-lanceolate, very entire, very rarely 2-3 toothed and minutely scabrous as well as the stems; lobes of the small corolla 3'-4' long, broadly obovate, twice exceeding the 7-10 setaceous divisions of the calyx; fructiferous calyx not exceeding the carpels.—Near Pueblo, *Greene*.

NYCTAGINACEÆ.

MIRABILIS¹ OXYBAPHOIDES, Gr. (*Quamoclidion oxybaphoides*, Gr. *Sill. Jour.*, 2d. S., 15, p. 320.) Stems procumbent, diffuse, slender; leaves all deeply cordate, on rather long petioles, lowest reniform, upper ones acuminate, often subangled; involucre 3-flowered, deeply 5-cleft, very viscid-glandular as well as the peduncles in the loose panicle, lobes ovate, rather acute, a little shorter than the campanulate perigonium; stamens 3; fruit subglobose-obovoid, glabrous, destitute of ribs or angles, blackish.—Cañon City, *Brandegee*. *Monterey Springs - B. H. Smith*

MIRABILIS MULTIFLORA, Gr. (*Oxybaphus multiflorus*, Torr. in *Ann. N. Y. Lyc.*, p. 237; *Quamoclidion multiflorum*, Torr. *Sill. Jour.* l. c., 321.) Pulverulent and minutely pubescent; stems subquadraangular, erect, widely branched, with enlarged joints; leaves opposite, broadly cordate, acute or acuminate; petioles 4'-6' long; flowers axillary and terminal; involucre campanulate, 1' long, pedunculate, segments ovate, acute; flowers 4-7; perianth funnel-form, 1½'-2' long, persistent, 5-lobed, lobes acuminate, purple; stamens 5-6, as long as the perianth; anthers large, yellow; fruit smooth.—Cañon City, *Brandegee*. *Monterey Springs?*

OXYBAPHUS NYCTAGINEUS, Sweet.—*Hall & Harbour*, 483. Golden City, *Dr. Smith*. Denver, *Porter*. Cañon City, *Brandegee*.

Var. CERVANTESII, Gr. (*O. Cervantesii*, Lag.) *Bot. Mex. Bound. Surv.*, p. 174. Branches and involucre viscid-pubescent or villous; leaves much thicker, obtuse, and cordate or sub-cordate at base.—Cañon City, *Brandegee*.

Var. OBLONGIFOLIUS, Gr. *Bot. L. c.*, p. 174. Leaves ovate-lanceolate or oblong, thick, not cordate at base, about 2' long; panicles terminal, laxly many-flowered, expanded; stems 2°-4° high.—Cherry Creek, near Denver, *Dr. Smith*. Cañon City, *Brandegee*.

OXYBAPHUS HIRSUTUS, Sweet. *DC. Prod.*, 13, 2, p. 433. Very densely pilose with long, spreading, articulated hairs; leaves sessile, ovate, angulate-dentate or repand; involucre pubescent-tomentose.—Chiaum Cañon, *Porter*. Wet Mountain Valley, *Brandegee*. *Monterey*

OXYBAPHUS ANGUSTIFOLIUS, Sweet. Stems glabrous, ascending, slender, 1°-6° high; leaves glabrous, linear, usually elongated, 2'-4' long, thick, glaucous; flowers loosely paniced; peduncles and involucre pubescent; involucre with 5 triangular, ovate, acuminate lobes, 3-5-flowered, becoming 3' long in fruit; perianth short, sub-campanulate or rotate-funnel-form, scarcely exceeding the involucre, white or pink, the limb 1½' long; stamens exerted; fruit hoary-pubescent, 2½' long.—*Hall & Harbour*, 482. Denver and Colorado Springs, *Porter*. Cañon City, *Brandegee*. *Dr. Smith*; *B. H. Smith*. *Monterey Springs et*

¹ MIRABILIS, L. Involucre herbaceous, scarcely changed in fruit, calyx-like, of united leaves, 5-lobed, 1-2-flowered. Calyx tubular, or more or less broadly funnel-form. Stamens almost always 5, united within the persistent base of the calyx. Stigma capitate, granulated. Fruit indurated, smooth, ovoid, not angled and scarcely or not at all ribbed. Seed straight, with an incurved embryo, inferior radicle, and foliaceous cotyledons.—Herbs, with jointed stems, opposite leaves, and flowers solitary in the axils, or in crowded terminal clusters.

*ALLIONIA*¹ *INCARNATA*, L. *DC. Prod.* 13, 2d pt., p. 434. Stem herbaceous, prostrate, elongated, whitish, mostly woolly; leaves petioled, unequal in the same pair, obtuse at each end or obliquely subcordate at base, margin sinuate, whitish-villose; peduncles solitary; lobes of the involucre lanceolate, acute, reflexed after flowering.—Cañon City, 1873, *Greene*.

*ABRONIA*² *PRAGEANS*, Nutt. Viscid-pubescent; stems numerous from a perennial root, ascending $\frac{1}{2}$ °–1 $\frac{1}{2}$ ° high; leaves oblong or ovate, truncate or more or less cuneate at base; obtuse or acutish; peduncles, mostly solitary, elongated; bracts of the involucre large, broadly ovate, white and scarious, obtuse or acute, 4"–9" long; stamens unequal; stigma clavate; fruit 3"–6" long, coriaceous, narrowly 1–2 winged or wingless, not crested; seed $1\frac{1}{2}$ " long.—*Hall & Harbour*, 572. Plains near Denver, *Dr. Smith*; *B. H. Smith*. Near Colorado Springs, *Porter*. Monument Park, *Coulter*.

ABRONIA *CYCLOPTERA*, Gr. *Sill. Jour.*, (N. S.), 15, p. 319. Glandular-pubescent; stems prostrate or ascending, 6'–18' long; leaves oblong, ovate or ovate-lanceolate, cuneate at base, obtuse, 1'–2' long; peduncles short; involucre of 5 ovate, acuminate bracts, 2"–5" long, 8–20 flowered; flowers bright rose-color, 6"–12" long, tube pubescent; stamens 3–5; fruit 7"–12" long, 4"–10" wide, including the 2–4 (usually 3) large semi-orbicular, membranous, strongly reticulated, pinkish-purple wings; seed $2\frac{1}{2}$ "–4" long.—*Hall & Harbour*, 573. Upper Arkansas, *Porter*. Grape Creek, Fremont County, *Coulter*.

CHENOPODIACEÆ.

*TELOXYIS*³ *CORNUTA*, Torr. *Bot. Whipple*, *P. R. R.*, p. 129. Glabrous, 12'–15' high, very much branched; leaves repand-dentate and pinnatifid; segments of the calyx acute, short beaked on the back; calyx beset with minute, elevated glands; flowers minute, terminal and sessile in the forks of the slender, dichotomous branchlets; the terminal ones soon fall away, leaving slender, persistent, awnlike pedicels; seed orbicular, thick, rounded on the margin and closely covered with the utricle which strongly adheres to its surface.—Mountains west of Denver, *Dr. Smith*; *B. H. Smith*. Pueblo, *Greene*.

CYCLOLOMA *PLATYPHYLLUM*, Moq.—Near Denver and Colorado Springs, *Porter*.

CHENOPODIUM *ALBUM*, L.—Exceedingly variable.—Cañon City, *Brandegee*. Denver and Colorado Springs, *Porter*. Mount Elbert near Twin Lakes, at 10,000 feet altitude, *Coulter*.

¹*ALLIONIA*, Linn. Involucre gamophyllois, 3-cleft, 3-flowered. Perigonium very small, limb 4-lobed. Stamens 4, freely included. Style simple; stigma capitate. Fruit covered with the indurated base of the perigonium, spinulose on the back. Embryo plicated. —*De Candolle*.

²*ABRONIA*, Juss. Involucre perfect, of 5–15 distinct leaflets, the head many flowered. Calyx silver-form, with obcordate lobes. Stamens 5, included, adnate to the tube. Style included; stigma capitate or linear-clavate. Perfect fruit 5-winged. Seed cylindrical, smooth. Embryo by abortion monocotyledonous, infolding the central mealy albumen.—Low herbs, with thick opposite petioled unequal leaves; peduncles axillary and terminal, and flowers in solitary involucre heads.

³*TELOXYIS*, Moq. Flowers perfect, bractless. Calyx 5-parted, segments subconcave, at length subcarinate, never appendiculate. Stamens 5, subperigynous. Filaments compressed, thickish, subdilated below. Anthers ovate-globose. Staminodia none. Nectary small, annular, depressed, somewhat fleshy. Ovary superior, depressed. Style terete, thickish. Utricle depressed. Calyx angulate, involute, not entirely closed. Pericarp distinct, membranaceous. Seed horizontal, lenticular, strongly depressed. Testa crustaceous. *DC. Prodr.*, 13, 2d pt.

CHENOPODIUM FREMONTII, Watson. *King's Rep.*, vol. 5, p. 287. More or less farinose, 6'-3' high, diffusely branched; leaves oblong, ovate or broadly triangular, mostly hastate, abruptly attenuate into a slender petiole; panicle loose and spreading, with short bractlets; branchlets very slender; calyx-lobes carinate-eucullate; seed horizontal, smooth and shining.—Colorado Springs, *Porter*. Cañon City, *Brandegee*.

CHENOPODIUM HYBRIDUM, L.—*Hall & Harbour*, 485. "Low mountains" Ute Pass, *Porter*. Near Denver, *Dr. Smith*. Twin Lakes, *Coulter*.

CHENOPODIUM GLAUCUM, L.—Near Denver, *Dr. Smith*. *Coulter*.

BLITUM CAPITATUM, L.—Near Denver, *Dr. Smith*; *B. H. Smith*. Colorado Springs, *Porter*. Twin Lakes, *Dr. Smith*. Mount La Plata, and Oro City, *Coulter*. *Wilson & Miller Park*

MONOLEPIS¹ CHENOPODIODES, Moq. *DC. Prod.*, 13, 2d pt., p. 85. (*Blitum Nuttallianum*, R. & S.) Glabrous, or somewhat glaucous and farinose; stems ascending or decumbent, 3'-12' high, branched; leaves $\frac{1}{2}$ '-2' long, attenuate into the petiole and hastate at base, the lobes acute and entire or the middle one lacinate-toothed; flowers in rather dense clusters in the axils, often reddish, the sepals lance-elliptic, obtuse, sometimes abortive; seed rather acutely margined, minutely tuberculate and not shining, $\frac{1}{2}$ " in diameter.—*Hall & Harbour*, 486. Colorado Springs, *Porter*. Near Denver and Twin Lakes, *Coulter*. *Montgomery*

ATRIPLEX PATULA, L.—Cañon City, *Brandegee*. Pueblo, 1873, *Greene*.

CORISPERMUM HYSSOPIFOLIUM, L.—Cañon City, *Brandegee*. Near Denver, *Dr. Smith*. Colorado Springs, *Porter*.

OBIONE² CANESCENS, Moq. *DC. Prod.*, 13, 2d pt., p. 112. Shrubby, 1'-5' high, hoary-canescens and pulverulent, unarmed, branches usually erect and virgate; leaves sessile, oblong or linear-oblong, narrowed at base, and obtuse or acutish, occasionally emarginate, entire, 1'-2 $\frac{1}{2}$ ' long and 2"-4" wide, (sometimes smaller and ovate or obovate;) flowers dioecious, the staminate in dense clusters at the extremities of the branchlets, the pistillate clusters less crowded, axillary; fruit 2"-3" long, hoary-pubescent, sessile or short-pedicelled, wingless or broadly winged by the more or less dilated margins of the variously toothed bracts.—*Hall & Harbour*, 308. Cañon City, *Brandegee*. ξ Denver and Colorado Springs, *Porter*.

OBIONE ARGENTEA, Moq. *DC. Prod.*, 13, 2d pt., p. 115. Annual and herbaceous, 6'-15' high, branching from the base, the branches ascending, densely mealy-canescens, especially when young; leaves rather thick and fleshy, $\frac{1}{2}$ '-2' long, usually hastate or deltoid, sometimes rhomboidal or ovoid, attenuate into the short petiole, obtuse or acutish, entire or rarely sinuate-toothed; flowers monœcious, in sessile axillary clusters upon the leafy branches; staminate clusters small; bracts somewhat orbicular, united at base, dilated and herbaceous above in fruit, becoming often 2"-3" in diameter, the margin deeply and acutely toothed and undulate, the sides strongly reticulated, and frequently more or less crested.—*Hall & Harbour*, 484. Cañon City, *Brandegee*. *Meehan*. ξ

¹ **MONOLEPIS**, Schrad. Flowers polygamous, bractless; calyx of a single scale-like sepal, persistent, without appendages. Stamen 1, inserted on the receptacle. Disk and staminodia none. Styles 2, filiform, somewhat united at base, stigmatic on the inner surface. Utricle strongly compressed, naked, rather thick, subadherent to the vertical flattened seed. Tests crustaceous, fragile. Embryo annular, surrounding the copious farinaceous albumen; radicle inferior.—Annual herbs, with alternate petioled leaves and clustered axillary flowers. *Moq. in DC. Prod.*

² **OBIONE**, Gaertn. Pistillate flowers all without calyx and 2-bracted, the bracts more or less completely united and becoming hardened or corky; radicle superior; otherwise as in *Atriplex*.—Monœcious or dioecious herbs or undershrubs, with mostly alternate entire or sinuate-dentate leaves. *Moq. in DC. Prod.*

Obione

shrubby, with oval leaves, Cañon

OBIONE SUCKLEYANA, Torr. *Pacif. R. R. Rep.*, 12, 2d pt., p. 47, pl. 4. Annual; stem branching, prostrate; leaves suborbicular, on long petioles, acutely repand-dentate, pale-green on both sides, nearly glabrous; glomerules axillary; monocious bracts of the sessile fruit deltoid, united to the summit, the margin narrowly winged, crenate-denticulate; male-flowers tetramerous.—*Meehan*; in a dry irrigating ditch three miles west of Denver.

EUROTIA ¹ **LANATA**, Moq. *DC. Prod.*, 13, 2d pt., p. 121. White-tomentose, 6'-18' high, woody below, the subherbaceous branches virgate and often simple; leaves numerous, alternate and fasciated, linear-lanceolate, 6"-18" long, 1"-2" wide, revolute upon the margins; flowers frequently dioecious; fruiting involucre 2"-3" long, penicillate with four dense tufts of long, white hairs, (becoming brown in the herbarium, as also the tomentum,) seed minute, $\frac{1}{2}$ " long. Known both as "White Sage" and "Winter Fat."—Near Denver and Colorado Springs, *Porter*. Cañon City, *Brandege*. *White Park*

SALICORNIA HERBACEA, L.—In dry saline marshes in South Park, *Porter*.

SUEDA MARITIMA, Dumort.—*Hall & Harbour*, 489; *Meehan*. *Cañon City*

SUEDA DEPRESSA, Ledeb. (*Salsola*, Pursh, *Fl. N. Am.*, 197. *Chenopodiina*, Moq., *DC. Prod.*, 13, 2d pt., p. 164.) Annual, herbaceous, prostrate, very much branched, glabrous, often reddish; stems (3'-6" long) and branches usually more or less flexuous; leaves mostly flatter and broader than in the last; flowers and seed similar.—*Hall & Harbour*, 488. "South Park and on the plains." South Park, near the salt-works, *Porter*.

SARCOBATUS ² **VERMICULATUS**, Torr. (*Fremontia vermicularis*, Torr. *Frem. Rep.*, pp. 95 and 317, t. 3.) Erect, 3'-6" high, diffusely branched, more or less spinose and the rigid divaricate or spreading branchlets spinose at the extremities; leaves 6'-18" long, 1"-2" wide, frequently much smaller and fasciated on the branchlets, scurfy-puberulent when young, becoming glabrous; staminate aments 3"-9" long, cylindrical or oblong, nearly 2" in diameter; anthers soon deciduous; winged calyx of the mature fruit 3"-6" broad; seed 1" in diameter, with a thin membranous transparent testa.—Near Cañon City, *Redfield*. *Cañon City*

¹ **EUROTIA**, Adans. Flowers monocious or sometimes dioecious; the staminate flowers glomerate-spicate at the extremities of the leafy branches; the pistillate below them, axillary, sessile, solitary or clustered, 2-bracted; bracts at first free, becoming connate, enlarging and including the flower in a calyx-like tubular involucre, the free summits elongated and narrowed. Calyx of the staminate flowers 4-parted, the lobes equal, membranous. Stamens 4, inserted on a naked receptacle. Fertile flowers without calyx, staminodia or nectariferous disk. Ovary ovoid. Styles 2, capillary, united only at the base, exerted, hirsute. Fruit utricular, membranous, villous, included in the exceedingly hirsute involucre. Seed vertical, compressed, obovate, with a simple membranous testa. Embryo nearly annular, surrounding the small mealy albumen, green; radicle inferior.—Low stellately-pubescent undershrubs, with alternate, short petioled entire leaves. *Ledebour in Flor. Ross.*

² **SARCOBATUS**, Nees. Flowers unisexual, monocious and dioecious. Staminate flowers in terminal aments. Scales eccentrically peltate, stipate, angular, cuspidate. Stamens 2-4 under each scale, naked, sessile; anthers oblong. Pistillate flowers solitary, axillary. Calyx ovate, compressed, nuceolate, contracted at the apex about the style and somewhat bifid, enlarged and thickened in fruit and developing below the middle a broad transverse undulate veined wing. Ovary sessile, very thin and membranous, flattened, orbicular, mostly oblique, terminating laterally and abruptly in the slender included persistent style; stigmas exerted, thick, divaricate, often unequal; ovule on a short funiculus, campylotropous. Seeds vertical, with a double integument; embryo flat-spiral, green; radicle inferior; albumen at the base very small or none.—A spinose shrub of alkaline soils, with alternate linear fleshy leaves.

AMARANTACEÆ.

AMARANTUS RETROFLEXUS, L.—Cañon City, *Brandegee*. Plains around Denver, *Coulter*. Introduced.

AMARANTUS ALBUS, L.—Plains around Denver, *Dr. Smith*. Cañon City, *Brandegee*.

MONTELIA TAMARISCINA, Gr.—Around Denver, *Dr. Smith*; *B. H. Smith*. Cañon City, *Brandegee*.

FREELICHIA FLORIDANA, Moq.—Around Denver, *Dr. Smith*. "Sand hills on the plains," *Hall & Harbour*, 487.

PARONYCHIEÆ.

PARONYCHIA PULVINATA, Gr. *Proc. Acad. Phil.*, March, 1863, p. 58. Matted-caespitose from a woody root, forming dense cushion-like tufts, nearly glabrous, occasionally sending out short nearly naked pubescent stems; stipules silvery, broadly ovate, entire, pointless, the uppermost somewhat acute but blunt, 2" long; leaves thick, oblong, obtuse, ciliate-scabrous upon the margin and somewhat minutely glandular-pubescent, 2½"-3" long and 1" wide, bright green and nerveless, equalling the stipules and with them densely covering the short stems; flowers immersed among the leaves, solitary, terminal, sessile; sepals oval, broadly scarious, awned a little below the somewhat arched apex; staminodia 5, similar to the fertile filaments; ovary glabrous, tapering into the rather short style. Alpine.—*Hall & Harbour*, 66; *Parry*, 297. Mount Lincoln, at 13,000 feet altitude, *Coulter*.

PARONYCHIA SESSILIFLORA, Nutt. Root woody, very densely caespitose, much branched and crowded; branches very dense, 2' high; leaves imbricated, linear-subulate, lowest erect, obtuse, the upper longer, recurved-spreading, acute or mucronate, rather longer than the 2-cleft stipules; flowers terminal, solitary, sessile; sepals arched at the apex within, with divergent setaceous awns rather shorter, oblong-linear, obscurely 3-nerved; sterile setæ as long as the filaments; style as long as the sepals, 2-cleft at the apex.—South Park, *Canby*. Wet Mountain Valley, *Brandegee*.

PARONYCHIA JAMESII, T. & G. Very minutely scabrous-pubescent, caespitose, much branched from the base, stems 4'-6' high; leaves linear-subulate, obtuse, ½' long, about the length of the internodes, uppermost mucronate; stipules shorter than the leaves, ovate-lanceolate, acuminate or setose; cymes dichotomous, few-flowered, crowded, with a central, sessile flower in each division; sepals minutely hairy at the base, linear-oblong, obscurely 3-ribbed, with very short cusps, arched at the summit within; sterile setæ as long as the filaments; style 2-cleft one-third of its length.—*Hall & Harbour*, 67. South Park, *Canby*. Abundant at the base of the foot-hills near Colorado Springs, *Porter*.

POLYGONACEÆ.

ERIOGONUM¹ ALATUM, Torr. *Sitgreaves' Rep.*, p. 168, t. 8. Perennial; root stout and blackish; stem erect, 1°-3° high, arising from a short, thick

¹ERIOGONUM, Michx. Involucre many-flowered. (seldom few, or very rarely 1-flowered.) campanulate, top-shaped, or cylindrical, usually 5-8-toothed or lobed, pointless. Flowers jointed upon their pedicels, which are more or less exerted from the involucre in flower; bractlets usually very delicate or very narrow. Calyx 6-parted or deeply 6-cleft. Stamens 9. Acheneum triangular, or in a few species 3-winged. —North American herbs or undershrubs, mostly west of the Mississippi.

caudex clothed with the remains of leaves, subflexuous, leafy; branches alternate, erect, paniculate; radical leaves spatulate or oblanceolate, 2'-4' long, 3"-5" wide, hirsute; peduncles terminal, in threes; flowers yellowish; involucre solitary, campanulate, 5-cleft; perigonia glabrous, segments equal; achenia with 3 prominent wings, 4" long; seed ovate, triangular.—North Park, *Hayden*. Plains around Colorado Springs, *Porter*. *Hall & Harbour*, 500. *mountain springs* *Empire*

ERIOGONUM JAMESII, Benth. *T. & G. Rev. of Erigoneæ, Proc. Amer. Acad.*, vol. 8, p. 155. Stems 5'-12' high, caespitose, from a branched, low-leaved, woody caudex; radical leaves spatulate-ovate or narrowly lanceolate; cauline leaves in verticils of 3-5, spatulate or oblong, subsessile, white-tomentose beneath; cyme dichotomous, leafy; involucre in the forks or sessile on the branches, many-flowered, loosely silky-villose externally, segments obovate or spatulate, perigonia somewhat petal-like, white or whitish, the 3 interior segments often becoming longer.—Colorado Springs, *Porter*. Cañon City, *Brandege*.

ERIOGONUM FLAVUM, Nutt. *T. & G., l. c.*, p. 156. Perennial, caescent with a silky-woolly or hoary pubescence; stems scapiform, 3'-6' high, from a thick, many-parted caudex; leaves spatulate or oblong-spatulate, becoming more or less glabrate above, radical ones crowded on the caudex; involucre ones about equaling the 2-8 rays, and of the same number; perigonia golden-yellow, 3" long, silky-villose on the outside, funnel-form at base, somewhat produced into a stipe; ovary hirsute at the apex.—*Hall & Harbour*, 505; *Parry*; *Canby*. Around Denver and Colorado Springs, *Porter*. Plains of the Platte, *Coulter*. Cañon City, *Brandege*.

ERIOGONUM HERACLEOIDES, Nutt. *T. & G., l. c.*, p. 159. Rather slender, 1½'-2' high, woolly, tomentose or webbed; sterile branches decumbent, subcaespitose, fasciculate, leafy at top; flowering branches or scape-like peduncles sometimes naked, most usually with a whorl of leaves in the middle, with a simple or compound umbel for the most part involucre-bracted; leaves spatulate-oblong or oblanceolate, white-woolly beneath or on both sides; involucre 6-8 cleft, the lobes spreading and soon reflexed, with numerous flowers; segments of the pale yellow, very glabrous calyx scarcely longer than the very slender stipe; filaments villous below; ovary more or less finely hirsute toward the top, especially upon the angles.—Pleasant Park, *Coulter*.

ERIOGONUM UMBELLATUM, Torr. *T. & G., l. c.*, p. 160. A span to a foot high, woolly, tomentose or webby, or sometimes glabrate; sterile branches decumbent or creeping, often stolon-like, loosely caespitose, fasciculate leafy at top; leaves obovate-spatulate or oval, narrowing to a petiole, white-woolly beneath; peduncles scape-like, leafless excepting the involucre of bract-like leaves subtending the simple or rarely subcompound umbel; involucre deeply 6-8 cleft, many-flowered; calyx very glabrous, yellow or sometimes white, the segments 2-3 times longer than the slender stipe; filaments and ovary as in the last.—*Hall & Harbour*, 504; *Parry*. Near Denver, *Dr. Smith*. Cañon City, *Brandege*. Plains and foot-hills near Colorado Springs, *Porter*. Sierra Madre Range and plains of the Platte, *Coulter*.

Var. **MONOCEPHALUM**, T. & G. Dwarf, depressed, caespitose; leaves glabrate above or on both sides, the blade ¼'-½' long; scape ½'-3' high, slender, bearing 2-4 capitate involucre with usually 1-3 bracts, or a single larger one, usually naked; flowers smaller.—Twin Lakes, *Coulter*.

ERIOGONUM (LACHNOGYNA) ACAULE, Nutt. *T. & G., l. c.*, p. 163. Perennial, matted-caespitose, white-tomentose; leaves sessile, densely

crowded upon the closely-branched caudex, oblong or sub-linear, margins revolute; heads of 1-5 nearly sessile short 3-5-toothed involucre, sessile among the uppermost leaves, sometimes shortly exsert-pedunculate in fruit; flower with a broad sessile base, the calyx hardly 2' long, tomentose, 6-parted, with equal oblong segments; filaments pilose only at base; ovary very tomentose with long tangled wool; leaves 2'-3' long, spreading from the imbricated sheathing base.—Discovered by Nuttall in the Rocky Mountains of Colorado; not seen by us.

ERIOGONUM (LACHNOGYNA) LACHNOGYNUM, Torr. *T. & G., l. c., p. 163.* Branches of the caudex very short and crowded; scape a span to 1° high, slender; leaves lanceolate or lance-oblong, 1' long, acute, petioled, more or less revolutely-margined, silky above, tomentose beneath; calyx silky-woolly, yellow within.—Southern Colorado and New Mexico. Bluffs of the Arkansas at Pueblo, *Greene*, 1873.

ERIOGONUM (HETEROSEPALA) OVALIFOLIUM, Nutt. *T. & G., l. c., p. 164.* Perennial, caespitose, acaulescent, hoary-woolly; leaves oval or somewhat rounded, petioled, crowded upon the numerous short branches of the caudex; scape 2'-8' high, simple, leafless, with a single head (very rarely 2) of few (3-8) closely sessile 5-8-toothed involucre; bracts very small or wanting; calyx with the base not produced, very glabrous, 6-parted, more or less yellow or rose-colored, wholly petaloid, becoming thin and scarious after flowering; segments very unequal, the outer very broadly oval, cordate at base with usually a rather deep sinus, the lobes reaching to the joint or beyond it, the inner narrow, spatulate, emarginate, connivent-erect and involute, each bearing 3 stamens at the claw-like base; ovary glabrous.—Rocky Mountains of Colorado to Utah and Nevada.

ERIOGONUM MULTICEPS, Ker. *T. & G., l. c., p. 166.* Clothed with very white appressed wool; branches of the caudex short, assurgent, leafy; leaves oblong-spatulate or oblanceolate, gradually attenuated into the petiole; scape 3'-5' high; head bracteate; bracts unequal, 1 or 2 of them often surpassing the involucre; flowers small; involucre 5-10, tubulose, 5-toothed; calyx white or brownish yellow, or tinged with red, somewhat woolly; segments obovate-cuneate, retuse; filaments nearly smooth.—Southern Colorado, *Brandegee*.

ERIOGONUM PAUCIFLORUM, Pursh. *T. & G., l. c., p. 166.* Becoming smooth, with the aspect of *Armeria*; branches of the caudex very short, crowded; leaves linear or subspatulate, revolute-margined, attenuated into a petiole, at length nearly smooth; scape 4'-6' high, bearing a single head; involucre 5-10, turbinate-campanulate, 5-toothed; calyx white, glabrous, segments oval; filaments pubescent below.—South Park, *Casby*; *Hoopes*.

ERIOGONUM MICROTHECUM, Nutt. *T. & G., l. c., p. 170.* Shrubby, rather low, (rarely 1° high,) very much branched from the base; tomentum floccose, sometimes rather thin; branches erect or assurgent, but the cyme either crowded or effuse; leaves narrowly oblong and linear; flowers white or rose-colored; rarely dull yellow, seldom over 1" in length, usually rather thick at base after flowering, glabrous within, the segments obovate, inner ones at least emarginate or retuse; ovary often scabrous above on the angles.

Var. FENDLERIANUM, Benth. Leaves broad, 1'-1½' long, 4'-5' wide; involucre 2' long, in an ample loose cyme.—Cañon City, *Brandegee*. Pueblo, *Greene*.

Var. EFFUSUM, T. & G., (*E. effusum*, Nutt., *Pl. Gamb., l. c., p. 172.*)

More woolly; leaves oblong or linear-oblong, margins more or less revolute; cyme many-flowered, decomposed, effuse-paniculate; rays usually longer; flowers white.—Common on the plains and foot-hills. Denver, *Dr. Smith*. Colorado Springs, *Porter*. Cañon City, *Brandege*. Canby. Plains of the Platte, *Coulter*.

ERIOGONUM BREVICALE, Nutt. *T. & G., l. c., p. 172.* Cæspitose; shrubby, the woolly leafy branches very short or depressed, bearing a naked elongated herbaceous scape-like peduncle; leaves 1'-2½' long and 1''-5'' broad, linear, oblong-linear or narrowly spatulate-oblancoolate, attenuate into a slender petiole, white-woolly on both sides or becoming glabrous above, the margins at length mostly revolute; scapes rigid, 3'-10' high, the cyme repeatedly umbeloid or trichotomous, calculately bracted at the nodes; peduncles and the 5-toothed oblong or cyathiform-campanulate involucre (1½''-2'' long) glabrous or some glabrate; calyx glabrous within, white or rose-color or sometimes bright yellow, the segments obovate-oblong and nearly equal.—“From the head-waters of the Platte to New Mexico.”

ERIOGONUM ANNUM, Nutt. *T. & G., l. c., p. 173.* Covered with a close white wool; stems tall, 1°-3° high, strict, leafy below; leaves oblong, attenuated at the base, numerous, short-petioled; cymes decomposed; flowers numerous; involucre snowy-woolly, glabrous within, teeth 5, short; calyx white, furnished at base with long, delicate, arachnoid wool, segments unequal, outer ones much larger, broadly obovate, inner ones oblong; bracteoles slightly plumose.—Plains around Denver, *Dr. Smith*. Around Colorado Springs, *Porter*. Canby. *Hall & Harbour*, 501.

ERIOGONUM CERNUUM, Nutt. *T. & G., l. c., p. 182.* Annual, slender, 4'-15' high; leaves radical or sometimes cauline, round or obovate, somewhat long-petioled, floccose-woolly; panicle glabrous, widely spreading, decomposed, usually very-many-flowered; pedicels soon deflexed smooth, 2-3 times longer than the campanulate, glabrous, many-flowered involucre; bractlets setaceous, short, subnaked; calyx white or pinkish, glabrous 6-cleft, turbinate and acute at base, the outer segments square, emarginate or retuse, scarcely exceeding the oblong half-as-wide inner ones. Involucres not over 1'' long; flowers scarcely as long and often much shorter, and well marked by the top-shaped base.—*Hall & Harbour*, 503; *Canby*. Upper Arkansas, *Porter*. Cañon City, *Brandege*.

ERIOGONUM GORDONI, Benth. *T. & G., l. c., p. 185.* Glabrous throughout; leaves subcoriaceous, round; peduncles several from the root, short, repeatedly divided above into an ample, loose dichotomous panicle, branches slender, pedicels subcapillary, 9''-14'' long, erect; flowers 2-3, white, very small; involucre turbinate-campanulate, 5-toothed; outer segments of the very smooth calyx ovate, a little longer than the oblong inner ones; bractlets minutely glandulose.—Cañon City, *Brandege*. Plains about Pueblo, *Greene*.

ERIOGONUM TENELLUM, Torr. *T. & G., l. c., p. 186.* Cæspitose from a much branched woody caudex; leaves crowded, ovate or rounded, white-tomentose; scape and spreading panicle smooth; bracts very small; pedicels elongated, erect; involucre 1½''-2½'' long, rather many-flowered; flowers white, the segments retuse, unequal, the outer broad-obovate or rounded; bractlets villous.—“Colorado to New Mexico.”

OXYRIA DIGYNA, Campd.—*Hall & Harbour*, 494; *Parry*. Gray's Peak, *Dr. Smith*. Mount Lincoln, at 13,000 feet altitude, and Horse Shoe Mountain, at 11,000 feet, *Coulter*.

RUMEX VENOSUS, Pursh. *DC. Prodr.* 14, p. 43. Stem branched, 1°

high; leaves thick, flat, glabrous, petioled, the lowest ovate-subcordate at base, the rest ovate-lanceolate or oblong, acute, attenuate at base; panicle leafy only at base; racemes axillary and terminal, solitary, simple, sessile, the fascicles 3-8-flowered; flowers perfect, on capillary pedicels jointed at the base and equaling the valves; valves equal, orbicular, deeply cordate, entire, closely reticulate-veined, destitute of a callus, becoming greatly dilated. Leaves often 4' long and 1½'-2' wide, on rather short petioles; valves bright rose-color at maturity, 9"-12" in diameter; outer sepals finally deflexed, about equaling the sinus of the valves.—*Hall & Harbour*, 495.

RUMEX LONGIFOLIUS, DC. *Prodr.* 14, p. 44. Stout, 3°-5° high; leaves elongated, acute, undulate, the lowest oblong, subcordate, or obtuse at base, 6'-15' long, 2'-4' wide, long-petioled, the upper lanceolate, attenuate at each end, and the uppermost linear; petioles flat above, with a thin linear margin; panicle simple, leafless above, the racemes sessile; valves about 2½" in diameter, broad-ovate, slightly cordate, obtuse, finely reticulated, subentire, without callosities.—*Hall & Harbour*, 499. Very common on Bear Creek and Horse Shoe Mountain, *Coulter*.

RUMEX SALICIFOLIUS, Weinm.—*Hall & Harbour*, 496 and 498. Cañon City, *Brandegee*. Denver, *Dr. Smith*. Colorado Springs, *Porter*. Oro City and plains of the Platte, *Coulter*.

RUMEX MARITIMUS, L.—"Subalpine," *Hall & Harbour*, 497. Head of Clear Creek, at 10,000 feet altitude, *Coulter*. Pueblo, *Greene*.

RUMEX ACETOSELLA, L.—Greeley, *Greene*.

POLYGONUM ERECTUM, L. (*P. aviculare*, L. var. *erectum*, Roth.) *Watson, Rev. of Polyg., Am. Nat.*, 7, p. 664. Erect or ascending, glabrous, 1°-2° high or more, pale or yellowish; leaves oblong or oval, 6"-30" long, usually obtuse; flowers mostly 1½" long, on more or less exserted pedicels; sepals rarely 6; stamens 5-6; achenium broadly ovate to lanceolate, dull and granular or nearly smooth.—Around Denver, *Dr. Smith*. Cañon City, *Brandegee*. North Park, *Hayden*. Weston's Pass, *Coulter*. Colorado Springs, *Porter*.

POLYGONUM RAMOSISSIMUM, Mx.—Colorado Springs, *Porter*. On the Platte near Denver, *Coulter*.

POLYGONUM TENUE, Mx.—*Hall & Harbour*, 492; *Meehan*. Colorado Springs, *Porter*. Sierra Madre Range, *Coulter*.

POLYGONUM IMBRICATUM, Nutt. *Watson, l. c.*, p. 665. Low, slender, often diffusely branched, 1'-8' high; leaves narrowly linear; spikes dense; bracts loosely imbricated, linear or oblong, 2"-4" long, with sometimes a narrow, scarious margin, acute; stamens 3 or 5; style one-third as long as the ovary. Alpine and subalpine.—*Hall & Harbour*, 493; "Blue River, on the western slope of the Rocky Mountains."

POLYGONUM AMPHIBIUM, L. var. *TERRESTRE*, Willd.—Near Denver, *Dr. Smith*. Near Colorado Springs, *Porter*.

POLYGONUM PENNSYLVANICUM, L.—Greeley, *Greene*.

POLYGONUM INCARNATUM, Ell.—Cañon City, *Brandegee*. Plains of the Platte, *Coulter*.

POLYGONUM VIVIPARUM, L.—*Hall & Harbour*, 491. Near Denver, *Dr. Smith*. Clear Creek Cañon, *Coulter*.

POLYGONUM BISTORTA, L. *DC. Prod.* 14, p. 125. Rhizoma thick and twisted; stems annual, very simple; sheaths long and striately nerved; leaves glabrous or puberulent beneath, the lowest cordate obtuse, with a long-winged petiole, the upper sessile, the highest linear or abort-

tive; spike dense, oblong, obtuse; pedicels exceeding the flowers; stamens exerted.

Var. OBLONGIFOLIUM, Meisn. Stem simple, 6'-20' high; leaves glabrous, the lowest oblong, the blade 3'-8' long, 1'-2' broad, scarcely decurrent by an abruptly attenuate base into a very long petiole; spike oblong, $\frac{1}{2}$ '-2' long.—Hall & Harbour, 490. Gray's Peak, Dr. Smith. Sangre de Cristo Pass, Brandegee. Mount Lincoln, at 13,000 feet altitude, Coulter. Parry; B. H. Smith. Twin Lakes, Porter. *San Juan Pass*

POLYGONUM DUMETORUM, L.—Cañon City, Brandegee. Foot-hills near Denver, Coulter.

ELEAGNACEÆ.

SHEPHERDIA CANADENSIS, L.—Hall & Harbour, 506. Twin Lakes, Coulter.

SHEPHERDIA ARGENTEA, Nutt.—Green Horn River, Greene, 1873.

SANTALACEÆ.

COMANDRA PALLIDA, DC. *Prod.* 14, p. 666. Stems from a woody caudex, herbaceous, striate, erect, 6'-10' high, branched above; leaves alternate, bluish, somewhat punctate on the margin, lower elliptical-oblong, mucronate-acute, 8''-12'' long, 2''-3'' wide, uppermost usually linear-lanceolate, 5''-10'' long, about 1'' wide; bracts linear-lanceolate, 2'' long; pedicels slender, 1'' long; flower as in *C. umbellata*, but the lobes more papillose-velvety, especially on the margin and within; calyx-lobes erect, spreading; fruit 3'' in diameter with a subfleshy epicarp.—Hall & Harbour, 507; Meehan. Saint Vrain Cañon, Coulter.

LORANTHACEÆ.

ARCEUTHOBIMUM¹ AMERICANUM, Nutt. *Engelm. in Boston Jour. Nat. Hist.*, 6, p. 214. Slender, fasciculately branched, greenish-yellow; flowers often verticillate; male flowers almost always terminal on short branchlets, crowded, rarely axillary; berry $1\frac{1}{2}$ '' long. On *Pinus contorta*, from Colorado northward and westward; flowers in August and September, maturing its fruit in 12-13 months. Delicately fasciculate, much branched plants, 1' or, 2'-3' high.—Meehan. Mount of the Holy Cross, Coulter.

ARCEUTHOBIMUM ROBUSTUM, Engelm. in *Revision Arceuth. ined.* Stout spiked-branched, olive or brownish-green; flowers opposite, spiked; berry $2\frac{1}{4}$ '' long. On *Pinus ponderosa*, from Colorado southward and westward; flowers in June, maturing in 15-16 months. Stouter and darker colored than the last, 3'-4' high; flowers and fruit much larger.—Hall & Harbour, 574. Meehan; Woolson.

EUPHORBIACEÆ.

EUPHORBIA LATA, Engelm. *DC. Prod.*, 15, 2d pt., p. 18. Canescent with appressed pubescence; stems from a woody rootstock, spreading, short, rigid, dichotomously very much branched, 3'-4' high; lower internodes longer than the leaves, uppermost very short; leaves very short-petioled,

¹ ARCEUTHOBIMUM, M. Bieb. Dioecious. Male flowers mostly 3-parted. Anthers adnate to the middle of the lobes, 1-celled, with one circular opening; pollen grains spinulose. Female flowers mostly 2-parted; inferior ovary ovoid, compressed. Stigma oval or conic. Fruit ovoid, somewhat compressed, opening at base, on an exserted recurved peduncle.—Small yellowish or greenish-brown shrubs, parasitic on *Coccoloba*, with 4-angled compressed joints; opposite leaves reduced to small connate scales; fructification biennial.

triangular-ovate from a somewhat oblique, abruptly attenuated base, or oblong, obtuse, with revolute margins; stipules triangular-lanceolate, ciliate; involucre axillary, solitary, campanulate, hairy on the outside and in the throat, lobes triangular, elongated; glands ovate with a very narrow lobulate appendage; style short, 2-parted, somewhat thickened at the apex; capsule hirsute with appressed hairs; carpels obtusely carinate; seed oblong, 4-angled, transversely wrinkled.—Purgatory River, *Dr. Bell*.

EUPHORBIA PETALOIDEA, Engelm. *DC. Prod.*, 15, 2d pt., p. 28. Glabrous; stems dichotomous, procumbent or ascending; leaves attenuate to the scarcely oblique base, oblong-linear or linear, elliptic, 5"-7" long, 1½"-2" broad, obtuse, mucronulate, entire; stipules subulate, somewhat entire; involucre, solitary, on pedicels about their own length, campanulate, lobes hairy beneath the glands within, minutely-ciliate, triangular, acute; glands suborbiculate, concave, with an entire ovate appendage 3 times their breadth; style short, bifid; the carpels of the depressed capsule rounded; seed ovate, acute, obsoletely 4-angled.—*Hall & Harbour*, 512. Cañon City, *Brandegee*. Near Denver, *Dr. Smith & B. H. Smith*.

EUPHORBIA FENDLERI, T. & G. *DC. Prod.*, 15, 2d pt., p. 38. Glabrous, from a slender, short, somewhat woody root-stock; stems numerous, delicately filiform, rather rigid, erect or decumbent, much branched dichotomously 2'-4' high; leaves 1½"-2½" long, ovate from a rounded base, obtuse, entire, stipules subulate, often lacinate at base; involucre terminal, solitary, turbinate, slightly bearded in the throat, lobes short, ovate, fimbriate; glands transversely oblong with a very narrow obsolete appendage; style short, divaricate, bifid; capsule 1" broad, furnished with a small, somewhat 6-lobed calyx; carpels obtusely carinate; seed ovate, 4-angled, irregularly scrobiculate-punctate.—*Hall & Harbour*, 513. *Cañon City*

EUPHORBIA REVOLUTA, Engelm. *DC. Prod.* 15, 2d pt., p. 46. Glabrous; stem erect, filiform, naked below, much branched above the middle, 4'-5' high; leaves 5'-12" long, ½" wide, narrowly linear, entire, obtuse, revolute on the margins, attenuated below, base rather oblique, short-petioled; stipules subulate, entire; involucre very small, uppermost in the forks of the branches and terminal, somewhat truncate, short-campanulate, lobes triangular-lanceolate, ciliate; glands purple, 3 or 4 times broader than the whitish or reddish, oblong appendage; styles short, bifid; capsule glabrous, acute, carinate, ½" long; seed oblong, sharply 4-angled, sparingly and irregularly rugose.—*Cañon City, Brandegee*.

EUPHORBIA MACULATA, L.—Plains near Denver, *Coulter*.

EUPHORBIA GLYPTOSPERMA, Engelm.—*Cañon City, Brandegee*. Colorado Springs, *Porter*. *Canby*. Near Denver, *Dr. Smith*.

EUPHORBIA HEXAGONA, Nutt. *DC. Prod.*, 15, 2d pt., p. 52. Somewhat hairy with scattered appressed hairs; stem slender, 1'-1½' high, erect, annual; branches opposite and dichotomous, striate-angled, lower ones 6' long; leaves all opposite, short-petioled, linear-lanceolate, attenuate at each end, acute, mucronulate, entire, lower ones with the petiole 1½' long, 2"-2½" wide; floral ones very narrowly linear; stipular glands minute; involucre hairy without and in the throat, short, many cleft; glands 5, transversely ovate, with a green ovate-triangular, acute appendage, twice their length; styles very short, capitate and somewhat 2-lobed at the apex; carpels of the smooth capsule (2" long) obtusely carinate; seed ovate, finely scrobiculate and tuberculate.—On the plains, *Hall & Harbour*, 511. Plains near Denver, *Porter*.

EUPHORBIA MARGINATA, Pursh.—*Hall & Harbour*, 508. Plains near

Cañon City, Brandegee. *Cañon City, Brandegee*. *Cañon City, Brandegee*.

Denver, *Dr. Smith*; *B. H. Smith*. Plains of the Platte, *Coulter*. Very abundant on the plains around Colorado Springs, *Porter*.

EUPHORBIA OBTUSATA, Pursh.—Cañon City, *Brandege*.

EUPHORBIA DICTYOSPERMA, Fisch. & Meyer.—*Hall & Harbour*, 510. Eastern Colorado, *Porter*.

EUPHORBIA MONTANA, Engelm. *DC. Prod.*, 15, 2d pt., p. 148. Perennial, very glabrous, glaucous; stems many from a thick root-stock, ascending, leafy, shortly branched from the upper axils or often simple, 8'-15' high; leaves scattered, rather thick, subsessile, entire, rounded at base, 4"-15" long, ovate, obtuse, the uppermost subverticillate; floral bracts orbiculate, triangular, rarely subcordate, very obtuse, mucronulate, broader than long; inflorescence umbellate, the rays becoming repeatedly dichotomous; involucre turbinate, roughish within, the lobes oblong-linear, velvety; glands transversely oblong, truncate, very shortly 2-horned; styles very short, bifid, thickened at the apex; capsule 2" long, ovate, smooth; seeds oblong, superficially pitted, caruncle shortly conical.—*Hall & Harbour*, 509; *Parry*, 438. Near Denver, *Dr. Smith*; *B. H. Smith*; *Cauty*; *Mechan*. Cañon City, *Brandege*. Colorado Springs, *Porter*. Boulder Cañon, Clear Creek Cañon, and plains of the Platte, *Coulter*.

TRAGIA NERITÆPOLIA, Müller. *DC. Prod.*, 15, 2d pt., p. 933. Low, erect or ascending; petioles 4-10 times shorter than the blade; blade lobate-dentate below, otherwise coarsely dentate; racemes short; bracts lanceolate; divisions of the pistillate calyx ovate or lanceolate; anthers oblong; filaments not thickened at the summit; ovary strigose-hirsute; styles connate about one-third their length, rather shortish, erect-spreading, subacuminate.

Var. RAMOSA, Müller. *DC., l. c.*, 934. (*T. ramosa*, Torr., in *Ann. N. Y. Lyc.* 2, p. 245.) Hirsute, erect, much branched, 6'-8' high; stem slender, at length flagelliform-elongated, weak and somewhat twining; leaves triangular-ovate from a cordate base or oftener lanceolate, gradually acuminate, 8'-12" long.—*Hall & Harbour*, 309. Cañon City, *Brandege*; *Redfield*; *Greene*.

CROTON (HENDECANDRA) TEXENSIS, Müller. *DC. Prod.*, 15, 2d pt., p. 692 (*C. muricatus*, Nutt.) Covered with a close, canescent, stellate pubescence, dichotomously branched and spreading, 1°-2° high; leaves petioled, lance-ovate, oblong or linear-lanceolate, obtuse or acute, 1'-1½' long, entire or repand; dioecious, racemes of male flowers short, pedunculate, somewhat interrupted; glands of the disk compressed obovoid, not coherent, shortly adnate to the calyx; filaments pilose; ovary stellate-tomentose, softly muricate; styles twice or thrice dichotomously 2-parted.—On the plains. *Hall & Harbour*, 514. Banks of the Platte, near Denver, *Dr. Smith*; *B. H. Smith*; *Porter*. Cañon City, *Brandege*.

ARGYROTHAMNIA¹ HUMILIS, Mill. *DC. Prod.*, 15, 732. (*Aphora humilis*, Eng. & Gr. *Pl. Lind.*, 1, p. 54.) Stem about 1° high, much branched, silky or strigose-pubescent, branches spreading, ascending, compressed, angled; leaves narrowed at the base, spatulate or obovate-lanceolate or linear-lanceolate, acute, entire, sparingly pubescent, with appressed hairs; raceme shortened, much shorter than the leaves, on very short peduncles; pedicels of the male flowers very short, of the fertile thrice shorter than the calyx.—Pueblo, *Greene*.

¹ARGYROTHAMNIA, Mill. *DC. Prod.*, 15. Male calyx valvate; female imbricated. Petals alternate with the calyx-segments; evolute or rarely suppressed. Glands of the disk opposite the divisions of the calyx, alternate with the petals. Female disk hypogonous, free; male free or connate with the staminal column. Stamens central, outer ones opposite the 5 petals; anthers dehiscent on each side. Rudiment of an ovary none. Ovules 1 in each cell; carpels 3, 2-valved; seeds globose, not arilled.

URTICACEÆ.

CELTIS OCCIDENTALIS, L. *Gray's Manual*, p. 443.—Cañon City, *Brandegee*. *C. reticulata* *Wats.*

URTICA GRACILIS, Ait. *Gray's Manual*, p. 444.—Plains of the Platte, *Coulter*.

URTICA DIOICA, L. *Gray's Manual*, p. 444.—Sierra Madre Range, at 10,000 feet altitude, *Coulter*.

PARIETARIA PENNSYLVANICA, Muhl. *Gray's Manual*, p. 445.—Cañon City, *Brandegee*. *Meehan*.

HUMULUS LUPULUS, L. *Gray's Manual*, p. 446.—*Hoopes*. Along the Platte, *Porter*. In the Sierra Madre Range, at 10,000 feet altitude, *Coulter*.—*Webster Cañon*, *Redfield*.

CUPULIFERÆ.

QUERCUS ALBA, L., var. GUNNISONI, Torr. *Pacif. R. R. Rep.* 2, p. 130. Shrub 6^o–10^o high; leaves oblong, somewhat coriaceous, with a minute, yellowish, downy pubescence underneath, 3'–5' long, with 3–4 pairs of rather narrow oblong subequal lobes; lobes subentire, obtuse; fruit on a long peduncle; cup hemispherical, about 5' broad and 3' deep; acorn smaller than that of *Q. alba*, usually 9' long and 5' in diameter, sometimes much shorter and scarcely exceeding the cup.—There is a great diversity of views among botanists as to the true position of this oak. Mr. Watson (*Amer. Nat.* 7, p. 372) regards it as one of the many varieties of *Q. undulata*, Torr., but it seems so widely different in the shape and section of its leaves and size of the fruit from the figure of that species as given in *Ann. N. Y. Lyc.* 2, pl. 4, that we prefer to retain the old name for the present.—At the base of the foot-hills, covering the dry slopes. The most common scrub-oak. *Canby*; *Hall & Harbour*; *Porter*; *Coulter*.

QUERCUS EMORYI, Torr., in *Emory's Rep.*, p. 152, pl. 9. A low shrub; leaves coriaceous, oblong, on very short petioles, 1'–2' long, variable in size, remotely and repandly toothed, or in the younger ones with deeper and crowded teeth; teeth short, bristle-pointed; glabrous above, yellowish-downy beneath; fruit pedunculate, solitary and in pairs; acorn ovoid or ovoid-oblong, mucronate; the scales appressed.—Cañon City, *Brandegee*.

CORYLUS ROSTRATA, Ait.—*Hall & Harbour*, 516.

BETULACEÆ.

BETULA OCCIDENTALIS, Hook. *Fl. Bor. Am.*, 2, p. 155. Watson in *King's Rep.*, vol. 5, p. 323, pl. 35. Shrub 8^o–12^o high; branches dark reddish-brown, sprinkled with resinous warts; leaves 1'–1½' long, 9'–15' wide, thin, broadly ovate, acute, truncate or cuneate at base, smooth above, lighter colored beneath, petioles, margins and veins somewhat hairy, not punctate, irregularly toothed or serrate, serratures short and glandularly mucronate; petioles slender, 3'–6' long; fruiting aments cylindrical, 9'–12' long; peduncles suberect, leafy, 3'–5' long; scales pubescent, ciliate, the lateral lobes divergent, quadrangular; seeds with wings twice broader than the body.—*Hall & Harbour*, 518; *Canby*; *Porter*. Along the Platte near Denver, *Coulter*. *E. p.*

BETULA GLANDULOSA, Mx.—“Subalpine,” *Hall & Harbour*, 517. Twin Lakes, *Porter*. Sierra Madre Range, *Coulter*. *Superior*

ALNUS VIRIDIS, Ait.—*Hall & Harbour*, 519. *Superior*

ALNUS INCANA, Willd.—Ute Pass, *Porter*.

SALICACEÆ.

SALIX NIGRA, Marsh., var. *AMYGDALOIDES*, Anders. *DC. Prod.*, 16, 2d pt., p. 201. Fertile aments spreading, thickish; scales sparingly pilose; leaves broadly lanceolate, long and sharply attenuate-acuminate, often subfalcate, very smooth, glaucous beneath; capsules long-pediceled, very glabrous. Resembles *S. lucida*.—A shrub or small tree, common along the Platte.—*Dr. Smith; Porter.*

SALIX LONGIFOLIA, Muhl., var. *ARGYROPHYLLA*, Nutt. *DC. Prod.*, 16, 2d pt., p. 214. Leaves and capsules clothed with a silvery-shining tomentum, becoming glabrate with age.—Banks of the Platte, *Dr. Smith; B. H. Smith; Porter.* Twin Lakes, *Coulter.*

SALIX DISCOLOR, Muhl.—Twin Lakes, at 10,000 feet altitude, *Coulter.*

SALIX LIVIDA, Wahl., var. *OCIDENTALIS*, Gr. (*S. rostrata*, Richards.)—*Hall & Harbour*, 522. Saint Vrain Cañon, *Coulter.*

SALIX CHLOROPHYLLA, Anders.—Twin Lakes and Mount Lincoln, at 11,000 feet altitude, *Coulter.*

SALIX CORDATA, Muhl.—*Hall & Harbour*, 524. Near Denver, *Coulter.*

Var. *ANGUSTATA*, Anders.—Bear Creek, 15 miles west of Denver, *Coulter.*

SALIX GLAUCA, L. *DC. Prod.*, 16, 2d pt., p. 280. Shrub of variable height, often low; aments leafy-peduncled, cylindrical, thickish, rather dense-flowered; scales acutish or obtuse, fulvous, darker at the apex, villous with long white hairs; capsules ovate-lanceolate, obtusish, densely snowy-tomentose, scarcely pedicelled; pedicel about the length of the nectary; style produced, usually bifid; divisions of the stigmas divaricate; leaves elliptical-lanceolate, mostly silky-villous on both sides, becoming somewhat glaucous beneath, veiny, entire.

Var. *SERICEA*, Anders. Leaves pilose with silvery hairs, broadly oval, ovate, obovate or lanceolate, acute or obtuse, 1'-2' long.—"Subalpine," *Hall & Harbour*, 523. Gray's Peak, *Dr. Smith.* Mount Lincoln, at 13,000 feet altitude and White House Mountain, *Coulter.* South Park, *Porter.*

Var. *PULLATA*, Anders. Leaves smoother, glaucous beneath.—Ute Pass and South Park, *Porter.* Mount Elbert near Twin Lakes, at 12,000 feet altitude, and Sierra Madre Range, *Coulter.*

SALIX DESERTORUM, Richards. *DC. Prod.*, 16, 2d pt., p. 281. Low, 20-30 high; aments very short, 6" long, subglobose, dense-flowered; scales pale rose-color, densely white-villous; capsules ovate, conic, white-woolly, sessile; style 2-parted, brown; leaves narrowly oblong, 6"-12" in length, 2"-4" wide, obtusish, rigid, more or less white-tomentose beneath, midrib prominent, yellow; staminate aments very small, 2"-4" long.—Mount Elbert, near Twin Lakes, *Porter.*

SALIX ARCTICA, Pall., var. *BROWNEI*, Anders. *DC. Prod.*, 16, 2d pt., p. 286. Dwarf, branches decumbent and much spreading; leaves spatulate-oblong, oblong, or oblong-elliptical, about 1' long; aments lateral and subterminal, short, 6"-8" long, on long, leafy peduncles; capsules mostly grayish-tomentose; style elongated; leaves nearly smooth or hairy, entire or remotely serrulate, pale and very veiny beneath.—*Hall & Harbour*, 520; *Parry.* Gray's Peak, *Dr. Smith.* White House Mountain, at 13,000 feet altitude, *Coulter.*

SALIX RETICULATA, L. *DC. Prod.*, 16, 2d pt., p. 301. Decumbent, rather stout; branches leafy at the summit; ament terminal, very long-peduncled, densely flowered, narrowly cylindrical; peduncle leafy; scales yellowish-pink, rounded ovate; capsule oval-ovate, sessile, hoary to

mentose; nectary somewhat cup-shaped, surrounding the base of the capsule and often exceeding it; style very short or none; stigmas 2-cleft, brown, divaricate; leaves 6"-9" long, oblong or suborbicular, mostly rounded at the apex, glaucous beneath, reticulately veined, entire, obtuse at base or subattenuate into a long and slender petiole; sterile aments 2"-4" long and very loosely flowered; fertile aments also short, 3"-6" long, densely flowered, on long naked peduncles.—Alpine, *Hall & Harbour*, 521. Sangre de Cristo Pass, *Braudegee*.

POPULUS TREMULOIDES, Mx.—Known as "Quaking Asp," and very common at middle elevations. *Hall & Harbour*, 527. South Park, *Coulter*. *Dr. Smith*.

POPULUS BALSAMIFERA, L., var. CANDICANS, Gr.—Commonly called "Cottonwood." *Hall & Harbour*, 526; *Dr. Smith*. Chicago Lakes, *Coulter*.

Var. ANGUSTIFOLIA, Watson. *King's Rep.*, vol. 5, 327. (*P. angustifolia*, James. Branches terete, glabrous; leaves ovate-lanceolate, attenuate at base, acute, glabrous, crenate-serrate.—Common along the Platte. *Hall & Harbour*, 525. Upper Arkansas, *Porter*. *Canby*.)

POPULUS ANGULATA, Ait.—Very abundant along the Platte near Denver, *Dr. Smith*.

CONIFERÆ.

PINUS CONTORTA, Dougl. *DC. Prod.*, 16, 2d pt., p. 381. A low tree, 16°-30° high; bud-scales lanceolate, acute, sublaccrate; sheaths short; leaves in pairs, 1'-2' long, numerous, rigid, erect-spreading, semi-terete and deeply channeled, mucronate and subacute, scarcely roughish on the margin; cones 1-4, verticillate, 1'-2' long, 10'-15" wide, ovoid, sub-obtuse, straight or curved, persistent; scales 3"-4" wide, with a shining, pyramidal, 4-sided summit, the transverse ridge acute, mucronate with a deciduous, straightish or incurved spine. *Newberry in Pacif. R. R. Rep. Bot.*, vol. 6, p. 35, pl. 5.

Var. LATIFOLIA, Eng. Mountain form, 15°-25° high; branches short and few, recurved with age; foliage sparse, often profusely cone-bearing; allied to the eastern scrub-pine, *P. inops*, which it closely resembles; known as "Red Pine." Parry remarks: "It is quite abundant on the crest and slopes of dry subalpine ridges, forming the principal part of the forest there and extending to near the snow-line; a symmetrical tree of rapid growth, with slim and tapering trunk a foot in diameter, a smoothish, grayish-brown bark, detached in thin scales, and tough but coarse wood, which is liable to warp, and rarely cut into boards."—Mount of the Holy Cross, *Coulter*. Twin Lakes, *Porter*.

PINUS PONDEROSA, Dougl. *DC. Prod.*, l. c., p. 395. Tall, with wide-spreading or subpendulous branches, ascending at the ends, somewhat twisted; bud-scales lanceolate-acuminate, fimbriate-ciliate on the margin; sheaths rather long; leaves in threes, rather long, 4'-10', and 3"-1" broad, clustered at the ends of the stout rigid branchlets, scabrous on the margin, rather sharply mucronate; male aments several, fasciated in heads, long-cylindrical, obtuse, straight or curved; antheriferous bracts suborbicular, crenate-dentate; cones 3-4, sessile, subpendulous, straight or conic-cylindric, 3'-6' long, 1½'-2' wide; scales 1'-1½' long, 6"-9" wide, the subrhombic summit elevated, radiately cracked, the transverse ridge acute, the mucro stout, sharp and recurved; bracts persistent, thickened; seed oval, 3"-5" long, the wing oblong, obtuse, 1' long.—A stately, symmetrical tree, reaching a height of 70 to 100 feet, with a

light red bark, yellowish-brown within, cracking irregularly and cleaving into small, very irregularly shaped scales; known commonly as the "Yellow Pine," and a most valuable timber-tree. Common through all the lower slopes and less elevated districts of the mountains. *Newberry, l. c., p. 36, pl. 4.—Hall & Harbour; Porter; Coulter.*

PINUS FLEXILIS, James. *DC. Prod., l. c., p. 403.* Tree of medium size; lower branches horizontal, upper ones ascending; bud-scales ovate, acuminate, subfimbriate; sheaths 6" long, of several ovate and linear-oblong, obtuse, deciduous scales; leaves 1'-3' (usually 2') long, $\frac{1}{2}$ " wide, in fives, densely crowded at the ends of the branchlets, rigid, smooth, obtusely mucronate; sterile aments numerous, 3'-5" long, in a thick, subterminal spike; cones resinous, 3-4, oval-oblong to ovate-cylindric, $2\frac{1}{2}$ '-5' long, $1\frac{1}{2}$ '-2' broad, obtuse; scales very broad, 8"-15", with a short truncate base, thick, pitted usually on both sides, the compressed summit terminating in the erect, acute, semicircular, transverse ridge, and a subrhombic, acutish umbo; seed 4"-5" long, $2\frac{1}{2}$ " wide, pale-colored with a rudimentary wing. Bark thin, scaly, reddish or sometimes gray. Rare.—Divide west of South Park, *Porter. Hall & Harbour, 529.*

PINUS ARISTATA, Engelm. *DC. Prod., l. c., p. 400. Trans. Acad. Saint Louis, vol. 2, t. 5 and 6.* A tree of medium size, 40°-50° high and 1°-2° in diameter; in alpine situations a stunted bush; leaves in fives, crowded, erect, curving, 3-angled, smooth, obtusely mucronate, deep green, sides marked by a longitudinal, white-glaucous stripe 1'-2' long; sterile aments aggregated, oval, bracteate at base; cones horizontal, violet-brown, ovate or ovate-oblong, obtuse, resinous, 3'-4' long, $1\frac{1}{2}$ ' broad; the apophysis of the scales dark-violet, rhombic, not prominent; transverse ridge acute; umbo small; awn lanceolate-subulate, rather long, straight; seeds obovate-oval, convex on both sides, nearly twice shorter than the obtuse, broadish wing.—A species known only from the alpine regions of the Rocky Mountains of Colorado.—*Hall & Harbour; Parry; Coulter.*

PINUS EDULIS, Engelm. *DC. Prod., l. c., p. 398.* A low, round-topped tree, branched from the base or near it, 10°-15° high, very strongly resinous; leaves mostly in pairs, rarely in threes, compressed-triangular, semiterete and when dried appearing channeled, always short, rigid, spreading, curved or straightish, smooth on the margin, mucronate, pungent, green on the back, white-glaucous, 1'-1 $\frac{1}{2}$ ' long (rarely 2'); bud-scales ovate-lanceolate, acute, subentire on the margin, not fimbriate-connected, teeth very short, at length lacerate; sterile aments several, small, oblong, obtusish, densely crowded in a short spike; antheriferous bracts ovate-orbicular, nearly entire; cones sessile, subglobose, 2' long and almost as broad; apophysis of the scales raised-pyramidal, thick, somewhat 3-angled, truncate at the apex, awnless; seeds in each scale 2 or solitary, oblong, very convex, subangled, brown, solid, wingless, 3'-4" in length, edible.—The "Piñon" of the Mexicans. A small, round-topped tree, branched from the base or nearly so and resembling a small apple-tree. The wood is full of resin and extremely slow to decay, thus furnishing excellent fuel for camp-fires. The nutlets, which are about the size of a pea, are agreeable to the taste, with a slight terebinthinate flavor, and are much sought after by the Indians. It abounds in Southern Colorado on the foot-hills and at lower elevations. Its northern limit in Colorado appears to be about ten miles south of Twin Lakes, at the base of the Snowy Range, and at Colorado Springs, east of the mountains. *Hall & Harbour, 532; Porter; Coulter.*

ABIES ENGELMANNI, Parry. (*Pinus commutata*, Parl. *DC. Prod., l. c.,*

p. 417.) Known as "White Pine." Dr. Parry found it "composing almost the entire forest growth of the mountain slopes of Middle Park about the head of Grand River; a magnificent tree, 80 to 100 feet high, with an even, columnar trunk, below, 2-2½ feet in diameter, tapering upwards, of rapid growth; bark scaly, smooth, and quite thin, of a purplish-brown color, full of tannin. The wood is remarkably white and soft, free from knot and scarcely resinous, preferred for inside work."—A tall tree, 60°-100° high, becoming much dwarfed at higher elevations, pyramidal; branches verticillate, lower horizontal, the upper ascending, branchlets puberulent; bark light-reddish; wood soft, white; leaves solitary, crowded, turned every way, short, curved or straight, rigid, compressed 4-angled, very short-mucronate, smooth on the angles, white-punctate on the sides beneath the green; sterile aments thick, ovate or ovate-cylindrical, obtuse, nearly equaling the leaves; antheriferous bracts almost orbicular, dentate-fimbriate, ovate-cylindrical, obtuse; scales numerous, imbricated, subcartilaginous, obovate, rhombic, subtruncate or emarginate, crenulate-eroded; bracts ovate-oblong, obtusish, irregularly dentate, 3 times shorter than the scale; seeds small, oval, convex on both sides, 1½ times shorter than the obovate wing; cones 2½-3' long, 1'-1½' broad, purplish-brown when mature; nutlets brown, with an almost violet wing. Closely allied to *A. nigra*, the "~~Hack~~ *alba* Spruce" of the East.—*Hall & Harbour; Parry; Coulter; Hoopes; Mehan.*

ABIES MENZIESII, Lindl. (*Pinus*, Parl. DC. Prod., 16, l. c., p. 418.) A tall tree, attaining a height of 100 feet, straight, pyramidal; branches subverticillate, spreading, upper ones ascending; leaves solitary, crowded, turned every way, short, curved or straight, rigid, thickish, compressed, 4-angled, mucronate-pungent, marked on each side of the prominent nerve with a white glaucous line; sterile aments, thick, oblong, obtuse, 9"-12" long; antheriferous bracts suborbicular, cristate-dentate; leaves 6"-12" long; fertile aments oblong-cylindrical, obtuse, curving; cones solitary or somewhat clustered, sessile, ~~sub~~ *prong* nodding, cylindrical or oval, obtuse, 2½'-3' long, 12"-15" wide, light-brown, obtuse; scales thin, 5"-7" wide, oval or sub-rhombic, more or less elongated above, obtuse or subemarginate and erose-dentate; bracts small; seeds 1"-1½" long; wing obovate, oblong, obtuse, 4"-6" long, pale.—Known as "Balsam." Parry says: "A finely-shaped tree, though of rather stiff outline, of rapid growth; wood very compact, but rather coarse-grained and pitchy; the logs taper too rapidly to saw up to advantage." Cones pendulous from the ends of the branches; leaves stouter than in any other allied species, stiff and very acute, almost spinescent.—*Hall & Harbour, 533; Hoopes; Coulter; Porter.*

ABIES GRANDIS, Lindl. (*Pinus*, Parl. DC. Prod., 16, l. c., p. 427.) Tall, *Concol* pyramidal, with horizontal branches; leaves 6"-18" long, 1" broad, numerous, in two rows, spreading or erect, rigid, straight or curved, more or less contracted and twisted above the base, obtuse or emarginate, green and subsulcate above, strongly keeled and glaucous beneath; cones 2½'-3' long, 1½'-2' wide, solitary, erect, oblong, obtuse, *?* greenish; scales 7"-10" long, 9"-12" broad, horizontal and close-pressed, broad-cuneate and anguiculate, the rounded upper margin subreflexed and usually resinous, pubescent, much exceeding the obovate, toothed, short-mucronate bracts; seed 3" long, 2" wide, obovate, cuneate, angled; wing nearly equaling the scale, somewhat 4-sided; bark rather thin, pale gray (or brownish) wood fine-grained and tough.—(Rare) in Colorado. *Chiasm Cañon and Glen Eyrie, Porter. Parry. Empire*

ABIES DOUGLASHII, Lindl. (*Pinus*, Parl. DC. Prod., 16, l. c., p. 430.) A

A. subalpina Eng.

tall, pyramidal tree, with horizontal, drooping branches; leaves solitary, crowded, somewhat 2-rowed, 6"-18" long, $\frac{1}{2}$ " wide, numerous, straight or curved, rigid, flat, linear, obtuse, entire, twisted above the rounded base; sterile aments 6"-8" long, approximate, the anther-crest short lanceolate, erect; fertile aments purple, the lobed foliaceous bracts long-exserted, usually reflexed; cones $1\frac{1}{2}$ '-4' long, 1'-1 $\frac{1}{2}$ ' wide, somewhat clustered, pendulous, obtusish; scales concave, rounded, entire, pubescent; bracts long-exserted, bifid, the acuminate, suberose, dentate lobes, shorter than the cuspidate midnerve; seed 3" long, acutely margined, a little shorter than the oblong, obtuse wing.—"Abundant through the eastern mountain district, except on the higher elevations. A very slightly tree, of the average height of 80 feet, with a graceful oval outline; the spreading branches curving upwards at the extremities. Wood of slow growth, but very indifferent, inclined to warp and crack, turning reddish-brown in drying." Known as the "Swamp Pine."—*Hall & Harbour*, 534; *Parry*; *Coulter*; *Porter*.

JUNIPERUS COMMUNIS, L., var. ALPINA, L.—*Dr. Smith*; *Hoopes*. Twin Lakes and Long's Peak, *Coulter*.

JUNIPERUS VIRGINIANA, L.—*Hoopes*; *Brandegee*.

J. occidentalis *Carr. & C. Manitou*

LEMNACEÆ.

LEMNA MINOR, L.—In the Platte, near Denver, *Porter*.

TYPHACEÆ.

TYPHA LATIFOLIA, L.—Wet Mountain Valley, *Brandegee*. *Denver*, 2

SPARGANIUM SIMPLEX, Huds.—Wet Mountain Valley, *Brandegee*.

var. ANGUSTIFOLIUM, Engelm.—*Parry*.

NAIADACEÆ.

POTAMOGETON NATANS, L.—Denver, *Dr. Smith*.

POTAMOGETON PERFOLIATUS, L., var. LANCEOLATUS, Robbins, *Gray's Manual*, p. 488.—Growing on the bottom of Twin Lakes, *Coulter*. *Brandegee*; *Dr. Smith*.

ALISMACEÆ.

TRIGLOCHIN PALUSTRE, L.—*Hall & Harbour*, 540. South Park, *Porter*.

TRIGLOCHIN MARITIMUM, L.—*Hall & Harbour*, 541. Cañon City, *Brandegee*. South Park, *Coulter*; *Porter*.

SAGITTARIA VARIABILIS, Eng.—Divide between Denver and Colorado Springs, *Porter*.

S. calycina *By Green E*

ORCHIDACEÆ.

HABENARIA HYPERBOREA, R. Br.—*Hall & Harbour*, 535. Mount Elbert, near Twin Lakes, at 10,000 feet altitude, Horse Shoe Mountain, and in the Sierra Madre Range, *Coulter*. Ute Pass, *Porter*.

HABENARIA DILATATA, Gr.—*Mechan*. Sierra Madre Range, *Coulter*. Wet Mountain Valley, *Redfield*.

HABENARIA OBTUSATA, Lindl.—*Hall & Harbour*, 536; *Parry*. Twin Lakes, at an elevation of 10,000 feet, *Coulter*. *Clear Creek*

GOODYERA MENZIESII, Lindl.—Golden, *Greene*; *Redfield*.

SPIRANTHES ROMANZOFFIANA, Cham.—Hall & Harbour, 539; Canby; Hoopes. Wet Mountain Valley, *Brandegee*. Meehan. Horse Shoe Mountain, at 11,000 feet altitude, *Coulter*. *Empire*

LISTERA CORDATA, R. Br.—West of Denver, *Greene*.

CALYPSO BOREALIS, Salisb.—Hall & Harbour, 537. South Park; Wet Mountain Valley, *Brandegee*.

CORALLORHIZA MULTIFLORA, Nutt.—Green Horn Mountains, *Greene*

CYPRIPEDIUM PARVIFLORUM, Salisb.—Wet Mountain Valley, *Brandegee*.

CYPRIPEDIUM PUBESCENS, Willd.—Foot-hills near the Platte, west of Denver, *Coulter*.

AMARYLLIDACEÆ.

HYPOXYS JUNCEA, Smith. Sparingly hairy; leaves filiform; scapes 1-3, filiform, 1-2 flowered; bracts bristle-like, shorter than the villous pedicels, divisions of the perianth oblong, the three exterior ones greenish and hairy without; partitions of the capsule vanishing at maturity; seeds black, minutely pitted. Scape 4'-9' long, at length procumbent. Flowers 9"-12" wide.—Grape Creek, *Brandegee*.

IRIDACEÆ.

IRIS TENAX, Dougl. ?—Dr. Smith; *Brandegee*; Hall & Harbour, 542.

SISYRINCHIUM BERMUDIANA, L.—Colorado Springs, *Porter*. Bear Creek, *Coulter*.

SMILACEÆ.

SMILAX ROTUNDIFOLIA, L.—Colorado Springs, *Porter*.

LILIACEÆ.

ZYGADENUS GLAUCUS, Nutt.—Hall & Harbour, 550; Canby; *Porter*. Mount La Plata, at 11,000 feet altitude, and Mount Lincoln, at 13,000 feet, *Coulter*.

ZYGADENUS NUTTALLII, Gr. (*Amianthium Nuttallii*, Gray. Var. a. *Ann. N. Y. Lyc.*, 4, p. 123.) Bulb tunicated; stem 8'-20' high, slender, with several elongated narrowly-linear bracteiform leaves, which are semi-amplexicaul or the lower slightly sheathing; lower leaves 2"-4" wide, folded-carinate, usually shorter than the stem, rough on the margin; raceme simple, usually very short, 1'-3' long, rarely 10'; flowers crowded, bracteate, on slender, elongated pedicels; lower bracts usually foliaceous, the upper membranous; sepals 1½"-3" long, ovate-elliptical, very obtuse, abruptly narrowed, and slightly glandular at base; ovary-cells 12-14 ovuled; capsule oblong-ovate, 6" long; seeds 2½" long, oblong.—Hall & Harbour, 551. Wet Mountain Valley, *Brandegee*. Clear Creek Cañon, *Coulter*.

STREPTOPUS AMPLEXIFOLIUS, DC.—Hall & Harbour, 543. Bear Creek, *Coulter*.

SMILACINA RACEMOSA, Desf., var. *AMPLEXICAULIS*, Watson. *King's Rep.*, vol. 5, p. 345. (*S. amplexicaulis*, Nutt. *Jour. Acad.*, Phil. 7, p. 58.) Leaves closely sessile and amplexicaul, shortly acuminate or only acute; style at least half as long as the ovary and equaling the stamens. Distinguished at once from the usual form by its less acuminate sessile leaves and longer style and filaments.—Wet Mountain Valley, *Brandegee*. Along the Platte, near Denver, *Coulter*.

Ventura albicaulis Miller, Nutt. & Lute. Park

SMILACINA STELLATA, Desf.—*Hall & Harbour*, 544. Wet Mountain Valley, *Brandege*. Near Denver, *Dr. Smith*; *B. H. Smith*. Colorado Springs, *Porter*; *Meehan*. Saint Vrain River, Clear Creek and Middle Boulder, *Coulter*.

LILIUM PHILADELPHICUM, L.—Bear Creek and Platte River, just within the foot-hills, *Coulter*. Chiann Cañon, *Porter*.

*CALOCHORTUS*¹ *GUNNISONI*, Watson. *King's Rep.*, vol. 5, p. 348, (*C. venustus*, var. Torr. *Bot. Gunnison's Rep. Pac. R. R. Surv.*, 2, p. 130.) Petals rounded at the apex, white above, yellowish-green below the middle and dark purple at base, strongly bearded with longish, gland-tipped hairs, which are also dark purple at base, the densely hairy gland transverse and occupying nearly the whole width of the petal; anthers 5" long, rather exceeding the somewhat dilated filaments, oblong-lanceolate, subcordate at base, narrowed above into an awn-like termination or acute; immature capsule narrowly oblong, attenuate above. Stem 6'-20' high, simple, 1-4 flowered with 1-3 narrowly linear, revolute leaves, 2'-4' long, the radical ones (1-few) longer (8'-12') and usually broader (4').—*Hall & Harbour*, 549; *Parry*. Denver, *B. H. Smith*. Colorado Springs, *Porter*. *Meehan*. Plains of the Platte, Pleasant Park, South Park, and Weston's Pass, *Coulter*.

*LLOYDIA*² *SEROTINA*, Reich. *Kunth. Enum.*, 4, p. 244. Stem 1-2 flowered, slender, erect or ascending, 2'-5' high; radical leaves filiform, equaling or longer than the stem, somewhat rigid, triangular, semiterete or teretish, cauline ones short, linear-lanceolate, amplexicaul and somewhat sheathing; sepals 4"-5" long, obovate, with 3 purplish lines.—Alpine. Pike's Peak. *Hall & Harbour*, 552; *Porter*. Gray's Peak, at 1,200 feet altitude, *Coulter*; *Redfield*.

ERYTHRONIUM GRANDIFLORUM, Pursh. Leaves 4'-8' long, 1'-2½' wide, oblong or elliptic-lanceolate, somewhat rough-margined, not spotted or punctate; scape 6'-15' high, 1 (or more) flowered; segments yellow, 9'-15' long, narrow-lanceolate, acuminate, reflexed; stigma capitate or more or less 3-cleft and spreading; capsule 9'-18' long, 4"-5" wide, oblong or obovoid, subtriangular, on a short stipe.—White House Mountain, at 13,000 feet altitude, August, in flower, and Sierra Madre Range, at 11,000 feet, in fruit, *Coulter*.

¹*CALOCHORTUS*, Pursh. (Including *Cyclobothra*, Sweet.) Perianth 6-parted, regular, deciduous, ventricose or broadly campanulate; sepals distinct, convolute in aestivation, the outer smaller, often greenish, oblong or lanceolate, acute or acuminate, spreading, usually beardless, the inner broadly obovate, cuneate and subunguiculate, bearded within and with a glabrous spot or nectariferous pit above the base. Stamens 6, inserted at the base of the sepals. Filaments subulate. Anthers linear-oblong, deeply perforated at the base for the insertion of the filament, erect, versatile. Ovary free, triangular, scarcely attenuate at the apex, 3-celled with numerous horizontal anatropous ovules in two rows. Stigmas 3, sessile or sub-sessile, narrow, folded, recurved, persistent. Capsule triangular, coriaceous-chartaceous, septically 3-valved. Seeds usually in one row, somewhat compressed, angular, with a loose, cellular testa. Embryo straight, terete, eccentric.—Herbs with tunicated bulbs, erect, somewhat branched, leafy, few-flowered stems, narrow and acuminate leaves, and terminal flowers.

²*LLOYDIA*, Salisb. Perianth 6-parted, regular, persistent; sepals distinct, subequal, spreading, with a transverse margined nectariferous fold above the base, imbricate in aestivation. Stamens 6, inserted at the base of the sepals, erect-spreading; filaments subulate-filiform; anthers oblong, rounded at the apex, deeply perforated at the emarginate base for the insertion of the filament, erect, versatile, longitudinally dehiscent along each margin. Ovary free, clavate-oblong, triangular, 3-celled, the ovules numerous, in two rows, horizontal, anatropous. Style persistent; stigma rather thick, shortly 3-lobed. Capsule obovate-elliptical, triangular, papyraceous, loculicidally 3-valved at the apex. Seeds in two rows in each cell, flattened, with a brown, membranously margined testa and very small embryo.—Bulbous herbs, stem simple, leafy; leaves narrow and grass-like; flowers erect, white, with purple or greenish veins.

LEUCOCRINUM¹ MONTANUM, Nutt. Leaves 6'-8' long, 1"-3" wide, flat or somewhat folded toward the base, thick, finely striate-veined, decumbent; outer bracts broad, acute or obtuse, the inner narrower and elongated; flowers 4-8, much shorter than the leaves; peduncles $\frac{1}{2}$ '-1 $\frac{1}{2}$ ' long, all radical, one-flowered; tube persistent, 1'-2' long, filiform, segments of the limb 6"-12" long, oblong-lanceolate, acute; anthers linear, about 2" long; style equaling the filaments; capsule 3"-4" in diameter.—Abundant on the plains east of the mountains. A charming little plant with delicate, snow-white, fragrant flowers which appear in early spring.—*Hall & Harbour*, 548. Colorado Springs, *Porter*. Cañon City, *Brandegee*. Plains around Denver, *Coulter*. Watson in *King's Rep.*, vol. 5, pl. 36.

ALLIUM CERNUUM, Roth.—Near Denver, *Dr. Smith*. Colorado Springs and South Park, *Porter*. Cañon City, *Brandegee*. *Hall & Harbour*, 547; *Meehan*; *Canby*. Common on the plains near Fairplay, *Coulter*.

ALLIUM RETICULATUM, Fraser. Watson in *Rev. King's Rep.*, vol. 5, p. 486. Coats densely fibrous; scape 6'-15' high, subterete; leaves very narrowly linear, elongated; umbel few-many-flowered, spreading; stamens and style shorter than the usually acute (3"-4" long) sepals; capsule crested, crest mostly short; very variable.

Var. α , (Watson.) Low, 6'-8' high; sepals 3" long, white or slightly pinkish, acuminate.—*Hall & Harbour*, 545. Wet Mountain Valley, *Brandegee*. Monument Park, *Coulter*.

Var. β , (Watson.) Taller, 10'-15' high, slender; bulb less densely fibrous; sepals white or pink, 3"-4" long, acuminate and strongly carinate, sometimes but little exceeding the stamens.—*Hall & Harbour*, 546.

Var. γ , (Watson.) Like the last, but the pedicels rather more slender; sepals usually more recurved and the whole lower stem with the bulb thickly fibrous-coated.—Wet Mountain Valley, *Brandegee*. Weston's Pass, *Coulter*.

YUCCA ANGUSTIFOLIA, Pursh. *Engelm. Rev.* in *King's Rep.*, vol. 5, p. 496. Stems none or short; leaves narrowly linear, scarcely narrowed above the broad base, rigid, spiny-pointed, nearly flat above, convex below, with very slender marginal fibres, $1\frac{1}{2}$ "-2 $\frac{1}{2}$ " long; flowers spiked; petals broad-ovate, $1\frac{1}{2}$ '-1 $\frac{3}{4}$ ' long; stigmas half as long as the ovary, sessile, erect; capsule cylindrical-ovate, thick, obtuse, short-pointed, dry, erect, septicidally 3-valved from the apex, the valves at last again divided at tip; seeds very thin, smooth, large, 5"-7" in diameter, with a wide margin; albumen not ruminated.—Plains of the Platte, *Coulter*; *Porter*. Along the base of the foot-hills, and called by the Mexicans "Soap Weed." *Denver, E. Colorado Springs, Laramie*

JUNCACEÆ.

LUZULA SPADICEA, DC., var. **PARVIFLORA**, Ledeb. (*L. parviflora*, Desv., var. *melanocarpa*, Gr. in *Manual*, p. 536.)—*Hall & Harbour*, 555. Mount Lincoln, at 12,000 feet altitude, and Clear Creek Cañon, *Coulter*.

¹ **LEUCOCRINUM**, Nutt. Perianth corolline, salver-shaped, marcescent; tube very slender, elongated; limb 6-parted, regular. Stamens 6, nearly equal; filaments adnate to the tube nearly the whole length, filiform; anthers erect, becoming curved, linear, 2-celled, attached by the emarginate base, introrse, with a lateral dehiscence. Ovary globose-ovate, 3-celled; ovules about 12 in each cell, in 2 rows, horizontal or subperpendicular on short foot-stalks. Style filiform, undivided; stigma dilated into a somewhat triangular cap. Capsule subglobose, obtusely triangular, membranous, loculicidally dehiscent. Seeds 5-6 in each cell, in 2 rows, subglobose.—A perennial acaulescent herb, with a short, thick subterranean root-stock and fleshy spreading elongated rootlets; leaves thick, linear, surrounded at base by membranous bracts; flowers white, peduncled.

JUNCUS SPICATA, Desv.—*Hall & Harbour*, 554. Cañon City, *Brandege*. Denver, *Dr. Smith*. *South. Flor.*

JUNCUS BALTICUS, Deth., var. *MONTANUS*, Eng. *Trans. St. Louis Acad.*, vol. 2, p. 442. Sepals of nearly equal length, inner ones more obtuse; anthers 4 times the length of the very short filament; capsule ovate-pyramidal, angled, beaked; seeds smaller, narrower and longer pointed.—Abundant everywhere in damp grounds, on the plains and in the mountains. Near Denver, *Dr. Smith*. *Hall & Harbour*, 567; *Porter*.

JUNCUS DRUMMONDII, E. Mey. *Eng. Rev., l. c.*, p. 445. Caespitose; stems 1^o-1½^o high, terete, filiform; sheath bristle-pointed; spathe ½-1½ long, mostly surpassing the simple, about 3-flowered panicle; sepals lanceolate, acute, or the outer ones acutish and scarcely longer than the inner ones, more than twice exceeding the 6 stamens, 3" or more long; anthers linear, a little longer than the filament; stigmas shorter than the slender, prismatic ovary crowned with a very short style, included; capsule ovate-oblong, triangular, retuse, 3-celled, equaling or a little shorter than the sepals; seeds ovate, striate-reticulate, long tailed, the body 3", including the tails, 1" long.—*Hall & Harbour*, 563.

JUNCUS HALLII, Engelm. *Rev., l. c.*, p. 446. (*J. arcticus*, Willd., var. *gracilis*, Hook.?) Caespitose; stems 6'-12' high, terete, filiform, much longer than the setaceous, terete leaves; leaves 2'-5' long, grooved just above the sheath; spathe scarcely or a little surpassing the subsimple, few-flowered, contracted panicle; sepals lanceolate, acute, 2" long, outer ones a little longer, twice exceeding the 6 stamens; stigma sessile, equaling the ovate ovary, included; capsule ovate, angled, retuse, 3-celled, scarcely exerted, deep brown; seeds oblong-linear, 5'-6" long, striate-reticulate, long tailed, body 3" long.—Found only by *Hall & Harbour*, near Lake Ranch, Colorado, 562.

JUNCUS PARRYI, Engelm. *Rev., l. c.*, p. 446. Caespitose; stems very thin and wiry, 4'-8' long; leaves sulcate one-half or two-thirds their length, terete above; spathe surpassing the very simple, 1-3-flowered panicle; sepals 2½"-3½" long, lanceolate-subulate, the outer ones longer, bristle-pointed, 3 times longer than the 6 stamens; anthers linear, 2-3 times longer than the filament; stigmas scarcely equalling the linear-prismatic ovary, attenuated into the style, included; capsule prismatic, very acute, brown, exerted, 3-celled; seed oblong, delicately striate-costate, 1" in length, long-tailed, body about 4" in length.—*Hall & Harbour*, 561. *Parry*, 360. White House Mountain, at 11,500 feet altitude, *Coulter*. *West. Flor.*

JUNCUS TRIGLUMIS, L. *Eng. Rev., l. c.*, p. 448. Stem naked; leaves radical, subulate, somewhat terete, channeled at base; flowers capitate in a terminal, erect head, about 3; sepals rather obtuse, shorter than the oblong, obtuse, mucronate capsule; filaments many times longer than the anthers.—*Hall & Harbour*, 557. *Parry*, 395. Alpine.

JUNCUS CASTANEUS, Sm. *Eng., l. c.*, p. 448. Stem 2-leaved; radical leaves subulate, the upper part flattened; head terminal, solitary; flowers 2-3; sepals 3" long, lanceolate, acute, shorter than the oblong, obtuse capsule; anthers linear, pointed, half as long as the filaments; stigmas exert; seeds oblong; body 4"-5" long, with the tailed appendages 1.6" or more long. Alpine.—*Hall & Harbour*, 560. *Parry*, 358.

JUNCUS VASEYI, Engelm. *Rev. l. c.*, p. 448. Caespitose; stems 1^o-2^o high, slender, rigid, striate, covered with brown sheaths at base, sometimes leaf-bearing; leaves elongated, setaceous, terete, striate, sulcate toward the base; spathe equaling or rarely longer than the small, contracted panicle; panicle ½'-1' long, green; sepals equal, lanceolate, 2" long, outer

ones subulate-tipped, inner ones broader, mucronate, more than twice longer than the 6 stamens; anthers equaling the filaments; stigma scarcely equaling the ovate ovary with its short style, included; capsule straw-colored, ovate, retuse, 3-celled, equaling or a little longer than the sepals; seeds very slender, body about 3" long, and with the appendages, 5"-7" long.—*Hall, fide Engelman.*

JUNCUS TENUIS, Willd.—Plains of the Platte, *Coulter*. Cañon City, *Brandegee*.

JUNCUS BUFONIUS, L.—*Hall & Harbour*, 559. Upper Arkansas, *Porter*. On the Platte, near Denver, *Dr. Smith*.

JUNCUS LONGISTYLIS, Torr. *Bot. Bound Surv.*, p. 223. *Eng. Rev.*, l. c., p. 453. (*J. Menziesii*, Gr. in *Pl. Parry.*, p. 34, and *Pl. Hall & Harbour*, p. 77.) Stems 2° high, caespitose, stoloniferous, terete, somewhat minutely scabrous above, leafy; leaves flat, grass-like; heads few, clustered in a contracted panicle, 1½"-3" long or rarely single; 3-8 or 12-flowered, flowers 2½"-3" long, the larger ones greenish, with brown striae, smooth, pediceled; sepals equal, ovate-lanceolate, very acute or cuspidate, twice longer than the stamens; ovary equaling the stamens and style; stigma exserted; capsule ovate, obtuse, mucronate or rostrate, chestnut-colored, shining; 3-celled, equaling or a little longer than the calyx; seeds oblanceolate or obovate, acute at each end, costate-reticulate, .25"-.27" long.—The most common *Juncus* in the mountains next to *J. Balticus*, var. *montanus*.—*Hall & Harbour*, 566. Denver, *Dr. Smith*; *B. H. Smith*. South Park, *Canby*. Twin Lakes, *Porter*. Cañon City, *Brandegee*. *Meehan*. Plains of the Platte, *Coulter*.

JUNCUS ALPINUS, Vill., var. *INSIGNIS*, Fries. *Eng. Rev.*, l. c., 458, (*J. articulatus*, L., var. *pelocarpus*, Gr.)—*Hall & Harbour*, 558; *Canby*.

JUNCUS NODOSUS, L., var. *MEGACEPHALUS*, Torr.—Denver, *Dr. Smith*; *B. H. Smith*. Cañon City, *Brandegee*.

JUNCUS MERTENSIANUS, Bong. *Eng. Rev.*, l. c., p. 479. (*J. cusifolius*, Hook. Gr. in *Pl. Hall & Harbour*.) Stem from a thick, creeping rootstock, caespitose, 7"-14" high, compressed, weak; leaves aversely compressed, usually ½"-1" wide, sheath auricled; flowers 15-25, dark brown, pediceled, single, rarely 2-3 in a rather loose head, 4"-6" broad; sepals ovate-lanceolate, the outer acuminate-subulate, the inner obtuse and mucronate or rarely acute and equaling the outer ones, exceeding the 3-6 stamens, equaling the broadly-obovate, obtuse, mucronate capsule; anthers oblong or oblong-linear, usually mucronate, equaling the filament or shorter; style mostly shorter than the obtuse ovary; seeds oblanceolate, obovate, fusiform, short-tailed at each end, reticulate-costate.—*Hall & Harbour*, 565. Cañon City, *Brandegee*. Ute Pass, *Porter*. Mount Lincoln, at 12,000 feet altitude, White House Mountain, at 11,000 feet, and Twin Lakes, *Coulter*. Wet Mountain Valley, *Redfield*.

JUNCUS XIPHIODES, E. Mey. *Eng. Rev.*, l. c., p. 481. Stem 1°-4° high, from a thick creeping rhizoma, erect, 2-edged; leaves compressed and equitant; flowers about 1½" long, pediceled, few or many in few or many heads; sepals lanceolate, subulate-acuminate, equal or the inner ones more obtuse, shorter, nearly twice longer than the 6 (rarely 3) stamens, usually equaling the angular, acute, mucronate or beaked capsule; anthers oblong-linear, almost equaling the filament; ovary ovate, attenuate into the shorter style; stigma subexserted; seeds ovate-ob-lanceolate, .25"-.26" long, pointed at each end, reticulated and transversely lined.

Var. *MONTANUS*, Engelm. Lower, ½°-2° high; leaves narrower,

$\frac{1}{2}$ "- $1\frac{1}{2}$ " wide, mostly auricled at base; heads 3-10 flowered, paler; rather numerous and paniced; flowers a little smaller, the inner petals shorter and mostly acute, the outer ones equaling the long-mucronate capsule.—*Hall & Harbour*, 564; *Canby*.

COMMELYNACEÆ.

COMMELYNIA VIRGINICA, L.—Purgatory River, *Dr. Bell*.

TRADESCANTIA VIRGINICA, L.—On the plains, *Dr. Smith*; *B. H. Smith*. Along the Platte, *Coulter*; *Redfield*.

CYPERACEÆ.

CYPERUS INPLEXUS, Muhl.—Near Denver, *Dr. Smith*. Cañon City, *Brandegee*. South Park, *Porter*; *Redfield*.

CYPERUS SCHWEINITZII, Torr.—“Low Mountains,” *Hall & Harbour*, 584. Wet Mountain Valley, *Brandegee*. Colorado Springs, *Porter*; *Redfield*.

HEMICARPHA SUBSQUARROSA, Nees.—Wet Mountain Valley, *Brandegee*.

ELEOCHARIS OLIVACEA, Torr.—Greeley, *Greene*.

ELEOCHARIS PALUSTRIS, R. Br.—Near Denver, *Dr. Smith*.

ELEOCHARIS COMPRESSA, Sulliv.—Pueblo, *Greene*.

ELEOCHARIS ACICULARIS, R. Br.—Near Denver, along the Platte, *Dr. Smith*.

SCIRPUS PAUCIFLORUS, Lightfoot.—*Hall & Harbour*, 582.

SCIRPUS CÆSPITOSUS, L.—*Hall & Harbour*, 583; subalpine.

SCIRPUS PUNGENS, Vahl.—Near Denver, *Dr. Smith*. ϵ

SCIRPUS VALIDUS, Vahl.—Near Denver, *Dr. Smith*. ϵ Cañon City, *Brandegee*.

SCIRPUS MARITIMUS, L.—Wet Mountain Valley, *Brandegee*.

SCIRPUS SYLVATICUS, L.—Cañon City, *Brandegee*.

SCIRPUS ATROVIRENS, Muhl.—*Hall*.

ERIOPHORUM POLYSTACHYON, L.—Wet Mountain Valley, *Brandegee*.

FIMBRISTYLIS LAXA, Vahl.—*Hall & Harbour*, 581.

ELYNA¹ SPICATA, Schrad. (*Kobresia scirpina*, Willd.) Cespitose; stems numerous, 1° high, slender, striate-angled; leaves filiform; spike 1' long, somewhat clavate.—South Park, *Hall & Harbour*, 598 and 599.

CAREX NIGRICANS, Meyer. Spike solitary, oblong, staminate at top; stigmas 3 or rarely 2; perigynium ovate, stipitate, ventricose, shining, gradually attenuated into a beak, sometimes few-toothed, nerveless, spreading or at length reflexed, rusty-colored, with an entire obliquely-cut mouth, about equaling the dark-brown, oblong, obtuse scale; the lowest scale rarely subleafy; achenium unequally 3-sided. Roots creeping; culms 6'-12' high.—*Hall & Harbour*, 609.

CAREX PYRENAICA, Wahl. Spike solitary, densely flowered, staminate at top, elliptic, rusty-brown; stigmas 3, rarely 2; perigynium fusiform or lanceolate, gradually attenuate, long-stipitate, nerveless, com-

¹ ELYNA, Schrad. Spikelets 2-flowered, covered by a bract. Scale single, its margins connate at base. Hypogonous setæ none. Pistillate flower of the spikelets below, style 1, stigmas 3. Nut 3-angled, short-mucronate by the persistent base of the style. Upper flower staminate, short pedicelled. Stamens 3. *Koch Fl. Germ.*

pressed, triquetrous, shining, at length horizontally spreading or reflexed, rusty-colored, the orifice cleft in front with its hyaline margins infolded, longer than the acute-lanceolate or obtuse-oblong rusty-brown scale; lowest scale rarely subleafy; achenium unequally triquetrous. Cæspitose; root fibrous.—*Hall & Harbour*, 608.

CAREX HALLII, Olney. *Hayden's Rep.*, 1871, p. 496. (*C. Parryana*, Boott, in part.) Monœcious or dioecious; sometimes with two erect spikes, one staminate and one pistillate, or with 1-3 spikes all pistillate; terminal spike much the largest, lower one often remote and subtended by a leafy bract; scales lanceolate or lance-ovate, brown, with a white midrib, entire, not ciliate, longer and narrower than the obovate, smooth, many-nerved perigynium; stigmas 3.—*Hall & Harbour*, 617.

CAREX SCIRPOIDEA, Mx.—*Hall & Harbour*, 610. South Park, Porter and Conby.

CAREX POLYTRICHOIDES, Muhl.—*Hall & Harbour*, 603.

CAREX AFFINIS, R. Br. "Spike solitary, staminate at top; stigmas 3; scales acute, lanceolate, the lower awned. Near *C. polytrichoides*, Muhl." *Olney in King's Rep.*, vol. 5, p. 362.—*Vasey*, 591.

CAREX OBTUSATA, Lilj. Terminal spike solitary, linear, androgynous, staminate above; stigmas 3; scales shorter than the perigynium; perigynium ovate-elliptical, turgid, shining, with a smooth, terete, acuminate, bifid beak, white and diaphanous at the apex, leaves linear, flat.—*Hall & Harbour*, 606.

CAREX BACKII, Boott.—*Hall & Harbour*, 612.

CAREX FILIFOLIA, Nutt.—Cæspitose; spikes simple, androgynous, staminate above, subcylindric, acute; perigynium subglobose, entire at the orifice; scales retuse; leaves filiformly-involute, shorter than the culm. *Nutt. Gen.*, vol. 2, p. 204.—*Hall & Harbour*, 605. Ute Pass, Porter

CAREX PAUCIFLORA, Lightfoot.—*Hall & Harbour*, 607.

CAREX DISTICHA, Hudson.—South Park, Porter.

CAREX CONJUNCTA, Boott.—Along the Platte, Coulter.

CAREX MURICATA, L., var. *GRACILIS*, Boott, in part. Spikes chestnut-colored, narrow, ovate, with 4-6 ovate few-flowered spikelets; leaves lax, long and narrow.—*Hall & Harbour*, 592. Weston's Pass, Coulter.

CAREX DOUGLASHII, Boott. Root creeping; culm 6'-12' high; spike dioecious, with about 12, sometimes more, ovate spikelets, the upper closely aggregated, the lower occasionally remote and compound; bracts sometimes setaceous, broad at base, sometimes scale-like and mucronate; style exerted, stigmas 2, very long; perigynium elliptic-lanceolate or ovate, tapering to a long serrated bifid beak, shorter than the lanceolate acute scale; achenium orbicular.—Near Long's Peak, Coulter.

Var. *MINOR*, Olney. (*C. petasata*, Dew., in *Hayden's Nebraska Plants*.) Spikes small, not closely aggregated; perigynium and scale small.—*Hall & Harbour*, 600.

CAREX SICCATA, Dew.—*Hall & Harbour*, 593.

CAREX MARCIDA, Boott. Culm 1^o-2^o high, rigid; leaves broad, linear, erect; spike oblong, pale, composed of numerous small ovate aggregated androgynous spikelets, staminate at top, the lower spikelets compound; stigmas 2; perigynium tawny, sub-orbicular, or ovate tapering to a bifid beak, plano-convex, nerved, winged, the upper margins serrated, short-stipitate, nearly equal to the acute ovate scale, which is of a pale straw-color with a white membranous margin; achenium tawny, lenticular, contracted at base.—*Hall & Harbour*, Greene.

CAREX TENELLA, Schk.—*Hall & Harbour*, 601.

CAREX CANESCENS, L.—*Hall & Harbour*, 602.

CAREX DEWEYANA, Schw.—*Hall & Harbour*, 596.

CAREX GAYANA, Dew. *Boott, Ill.*, pt. 3, p. 126, t. 411. Spike (sometimes wholly pistillate) ovate, capitate, fuscous-ferruginous; spikelets staminate at the apex or wholly staminate or pistillate, many, closely crowded, lower ones compound; bracts setaceous shorter than the spike; stigmas 2; perigynia somewhat rounded, with a short conic beak, orifice very small, hyaline, deeply cleft before, scabrous on the margins above, shining, spongy, chestnut-colored; scale ovate, acuminate, cuspidate, brown-ferruginous, with a whitish hyaline apex broader and longer than the perigynium.—*Hall & Harbour*, 595.

CAREX STELLULATA, L., var. SCIRPOIDES, Carey.—Wet Mountain Valley, *Braun*.

CAREX BONPLANDII, Kunth. Spikes of 8-12 blackish-purple or rusty spikelets, more or less bracted, staminate at base; stigmas 2; perigynium ovate or ovate-lanceolate, gradually tapering to a beak, the orifice entire and deeply cleft in front, wingless, more or less serrate on the margins at the apex, nerved, plano-convex, equaling the ovate subacute scale; achenium oblong-ovate, contracted at base, biconvex and apiculate.

Var. MINOR, Olney. Spikelets small, fewer; bracts scale-like.—*Hall & Harbour*, 591.

CAREX LEPORINA, L. *Fl. Suec.* Root woody-fibrous, spike oblong, tawny-brown, composed of 5-6 (rarely more) nearly round or obovate spikelets, staminate at base, alternately contiguous, sometimes aggregated into an elliptical head, the highest club-shaped; bracts sometimes filiform, not equal to the spikelets; stigmas 2; perigynium ovate, gradually tapering to a beak from an ovate base, the orifice obliquely cut, winged, and serrated upon the margins above the middle, nerved upon both sides, tawny, quite equaling the ovate-lanceolate acute scale, which is whitish-hyaline with tawny margins; achenium oblong, lenticular, stipitate, shining, chestnut-colored, apiculate at the base of the style.—Colorado, at 12,000 feet altitude, *Vasey, fide Olney*.

CAREX FESTIVA, Dew. Cespitose; spike ovate or nearly round, naked or bracteate, composed of 6-12 nearly round androgynous spikelets, staminate at base, closely aggregated into a head; stigmas 2; perigynium ovate-elliptical, tapering to a beak, the whitish-hyaline orifice obliquely cut anteriorly and finally bidentate, slightly nerved on both sides, winged, serrated on the margins above the middle, rusty-tawny, a little exceeding or about equaling the lanceolate obtuse whitish-hyaline rusty-margined scale; achenium oblong-obovate, abruptly apiculate, rusty-colored.—*Hall & Harbour*, 589 and 590. Ute Pass, *Porter*. White House Mountain and Mount Lincoln, at 12,000 feet altitude, *Coulter*. Breckenridge, *Braun*. Gray's Peak, *Dr. Smith*. Pike's Peak, *Canby*.

CAREX STENOPHYLLA, Wahl. Cespitose, 4'-6' high, stoloniferous from the base; spikes androgynous, staminate above, aggregated in an ovate or oblong head; stigmas 2; perigynium ovate, convex on the back, 9-11-nerved, serrulate-scabrous on the margin; beak white-membranaceous at the apex, emarginate on the back; scales acute; culm smooth, somewhat scabrous above.—*Hall & Harbour*, 597.

CAREX ATHROSTACHYA, Olney. Root fibrous; culm 1^o-2^o high, leafy; spike ovate, straw-colored, rusty-tinged, composed of 8-20 crowded spikelets, the lowest sometimes forming a remote distinct head; bracts 3-5, leafy, involucre-like, expanded at base into a hyaline

margin, the lowest much longer than the culm; stigmas 2; perigynium ovate-lanceolate, tapering into a long bifid beak, spongy at base, winged, serrate and waved on the margins, slightly nerved, shorter than or nearly equaling the ovate-lanceolate acuminate scale, which is membranous with bright rusty-colored margins.—Colorado, 587, *Vasey*.

CAREX ADUSTA, Boott.—*Hall & Harbour*.

CAREX STRAMINEA, Schk.—Denver, *B. H. Smith*. Near Colorado Springs, *Porter*.

CAREX TENERA, Dew. Culm 15'-30' high, slender, somewhat 5-sided, leafy towards the base; leaves much shorter than the culm; spikelets 3-5 small, somewhat clavate, distant, nodding or erect; perigynia ovate, compressed, beaked, subulate, nerved, ciliate-serrate, longer than the oblong-lanceolate scale.—The erect form, No. 14 of *Olney's Curvices Bor.-Am.*—*Hoopes*.

CAREX LIMULA, Fries., (not of Gray's *Manual*.) Culm 2°-2½° high, acutely angled; leaves erect, flat, rough on the margins, the sheathing base-leaves not fibrillose; spikelets erect, 3-4, the terminal one (or sometimes two) staminate, the remainder pistillate, often with staminate flowers at the apex, oblong, cylindrical, the lowest pedunculate; bracts leafy, surpassing the culm, with small blackish auricles; stigmas 2; perigynium oblong, compressed, faintly nerved, exceeding or equaling the black oblong single-nerved scale; acheneum obovate, compressed.—Colorado, at 11,300 feet altitude, *Vasey*, 582.

CAREX JAMESII, Torr. Whole plant glaucous; culm 8'-20' high; leaves broad, leathery, shorter than the culm, amplexant at base, the lower spreading and then incurved, with pale sheaths; spikelets 5-6, the lowest sometimes pedunculate or rarely radical on a long peduncle, the two upper ones staminate, blackish-purple, (the stamens brick-colored,) the lower one small; pistillate spikelets 3, sometimes 4, oblong, cylindrical, densely flowered, the uppermost sometimes with a few male flowers; bracts leafy, not usually sheathing, the lowest sometimes short-vaginate and exceeding the culm; stigmas 2; perigynium obovate, strongly nerved, glaucous or light-brown, the beak bidentate or emarginate with the mouth slightly ciliated or toothed, longer than the purplish-black scale, which has a greenish-white midrib; acheneum orbicular.—Monument Park, *Porter*. Weston's Pass and Twin Lakes, *Coulter*.

Var. *Olney*. (*C. Nebraskensis*, Dew.) Root stoloniferous; culm 16'-24' high; leaves broad, leathery, erect, nearly equaling the culm; spikes rusty-colored; perigynia spreading, shorter than the acute, lanceolate, dark-rusty scales.—*Greene*. Oak Creek, *Brandegee*.

CAREX RIGIDA, Good.—*Hall & Harbour*, 588 in part.

CAREX BUXBAUMII, Wahl.—*Hall & Harbour*, 619.

CAREX ATRATA, L.—*Hall & Harbour*, 588 in part. South Park, *Canby*. Mount La Plata, at 12,000 feet altitude, and Mount Lincoln, at the same elevation, *Coulter*.

Var. *OVATA*, Boott. Spikes 3, oblong (the lower pedunculate with few staminate flowers) dark purple; perigynia glaucous-green.—*Hall & Harbour*, 585. Summit of Pike's Peak, *Canby*.

Var. *NIGEA*, Boott. Spikes subrotund, crowded or aggregated or the lowest distinct, sessile; perigynia oval or elliptical, cylindrically-rostrate, toothed on the margins of the beak, especially above; stigmas 2-3.—*Hall & Harbour*, 577. Gray's Peak, *Dr. Smith*. *Canby*; *Brandegee*; *Meehan*. White House Mountain, at 11,000 feet altitude, *Coulter*.

CAREX ALPINA, Vahl.—*Hall & Harbour*, 618. Chicago Lakes, at 12,000 feet altitude, *Coulter*.

CAREX AUREA, Nutt.—Mount La Plata, at 11,000 feet altitude, *Coulter*.

Var. *ANDROGYNA*, Olney. Culms short, more rigid; leaves erect, broader; upper spikes more closely aggregated and denser flowered, the upper spike generally androgynous, having more or less fertile flowers at the top.—Colorado, Dudley's Ranch, *E. L. Greene*.

CAREX GEYERI, Boott. (*C. phyllostachya*, Dew., in *Bot. Mex. Bound.*, not of Meyer.) Spike simple, androgynous, the top cylindric and staminate, pale, at length bright-rusty, with 1-5 pistillate flowers at the base, remote and erect with the rachis; stigmas 3; perigynium oval-triangular, produced at base, short-beaked, entire at the orifice, whitish-hyaline, membranous, smooth, with two prominent nerves, shorter than the broad-ovate, obtuse or acute sheathing cuspidate or foliaceous scale, which is whitish with a green nerve.—*Hall & Harbour*, 611.

CAREX TORREYI, Tuckerm.—Clear Creek, near Golden City, *E. L. Greene*.

CAREX ROSSII, Boott. Spikelets 4-5, pale, few-flowered, the terminal one staminate, the rest pistillate, each of 3-6 alternate and distinct flowers, the upper 3 spikes approximate, the lower remote, exsertly but unequally long-pedunculate; and upper bract surpassing the culm, the lower sheathed, and all but the lower short-peduncled; stigmas 3; perigynium oval, stipitate, long beaked, bifid, pubescent, nerveless, equaling the ovate-lanceolate acute or cuspidate scale; achenium globose-triangular, obtuse.—*Hall & Harbour*, 620.

CAREX CAPILLARIS, L.—*Hall & Harbour*, 613.

CAREX PENNSYLVANICA, Lam.—Ute Pass, 1872, *Porter*.

CAREX LANUGINOSA, Mx.—South Park, *Canby*. Ute Pass, *Porter*. Cañon City, *Brandegee*. *Meehan*.

CAREX UTRICULATA, Boott.—*Hall & Harbour*, 615; *B. H. Smith*; *Brandegee*.

Var. *MINOR*, Boott. "Swamps on low mountains," *Canby*.

CAREX LONGIROSTRIS, Torr., var. *MINOR*, Boott. Culm short; spike shortened; beak shorter.—*Hall & Harbour*, 614.

GRAMINEÆ.

ALOPECURUS ALPINUS, Sm. *English Fl.* 1. p. 81. Culm erect, smooth, 6-10 high; pale about equaling the rather acute glumes; awn exserted more than half its length, slightly bent but not twisted; glumes 3-ribbed, covered on the back with long, dense, white hairs; upper leaf much shorter than its inflated sheath.—*Hall & Harbour*, 683. Gray's Peak, *Dr. Smith*.

ALOPECURUS ARISTULATUS, Mx.—*Hall & Harbour*, 682. Monument Park, *Coulter*. Platte River, near Denver, *Dr. Smith*. Cañon City, *Brandegee*.

PHLEUM ALPINUM, L.—Gray's Peak, *Dr. Smith*; *Meehan*. Twin Lakes, *Porter*. Sangre de Cristo Pass, *Brandegee*. Sierra Madre Range, at 11,000 feet altitude, Weston's Pass and Twin Lakes, *Coulter*.

VILFA CRYPTANDRA, Torr. (*Sporobolus cryptandrus*, Gray.) On the plains near Denver, *Dr. Smith*. Colorado Springs, *Porter*. Cañon City, *Brandegee*. *Hall & Harbour*, 648.

VILFA AIROIDES, Trin. (*Sporobolus*, Torr.) Like the last, but the panicle at length much exerted, very open and widely spreading; flowers all on distinct pedicels; sheaths naked at the throat or somewhat bearded; leaves mostly erect and involute.—Cañon City, *Brandegee*. *Hall & Harbour*, 647.

VILFA ASPERIPOLIA, Nees & Meyen. Culms branching at base from running root-stocks, decumbent and often rooting, 6'-15' long, glabrous; the smooth, naked sheaths equaling or exceeding the internodes; leaves flat, rough on the margins, 1'-3' long, 1" broad, acuminate, tapering upward from a broad base, erect; branches of the loose, spreading panicle capillary, solitary, axils naked; spikelets less than 1" long, often 2-flowered; glumes slightly unequal, hispid on the back, acute, one-third shorter than the nearly equal paleas; lower palea submarginate, the upper obtuse.—Cañon City, *Brandegee*. *Hall & Harbour*, 641; *Redfield*.

VILFA RAMULOSA, H. B. K. *Steud. Gram.*, 158. Root annual, fibrous; culms very slender, branching from the base, 3'-10' high; sheaths usually longer than the internodes, glabrous or slightly hairy; leaves flat or convolute, 1'-2' long, $\frac{1}{2}$ "-1" wide, roughish; panicle elongated and rather narrow, often sheathed at base; branchlets scattered; spikelets scarcely $\frac{1}{2}$ " long, obtusish, on spreading, finely capillary pedicels; glumes nearly equal; paleas obtuse, nearly twice longer.—Divide between Denver and Colorado Springs, *Porter*. *Hall & Harbour*, 643.

VILFA CUSPIDATA, Torr.—*Hall & Harbour*, 661.

VILFA DEPAUPERATA, Torr. Root perennial, creeping; culms ascending, appressed, branched, slender, often geniculate, glabrous, striate, rather rigid, $\frac{1}{2}$ "-2" long; leaves 1'-3' long, narrow and usually convolute, recurved or spreading; panicle, very slender, and contracted, 1'-3' long, compound or often nearly simple; spikelets small; glumes unequal, ovate, obtuse or acutish, membranous, $\frac{2}{3}$ the length of the acute lower palea.—Like the former, but differs in its short obtuse glumes, smaller flowers, narrower involute leaves and more slender habit.—*Hall & Harbour*, 660. South Park, *Conby*. Wet Mountain Valley, *Brandegee*. Divide between Denver and Colorado Springs, *Porter*.

VILFA TRICHOLEPIS, Torr. *Pacific R. R. Rep.*, vol. 4, p. 155. Culms erect, simple, terete, 9'-18' high, tufted; nodes distant; sheaths glabrous; ligule truncate; leaves $\frac{1}{2}$ " broad, glabrous; branches of the oblong, rather dense panicle alternate, naked in the axils; branchlets flexuose; pedicels longer than the spikelets; glumes nearly equal, acutish, $\frac{1}{2}$ shorter than the nearly equal pilose paleas; lower palea 3-nerved.—*Hall & Harbour*, 631. Pike's Peak, *Conby*. South Park, *Porter*.

AGROSTIS SCABRA, Willd.—Mt. Elbert, at 10,000 feet altitude, and Sierra Madre Range, *Coulter*. Twin Lakes, *Porter*. Cañon City, *Brandegee*.

AGROSTIS EXARATA, Trin. *Steud. Gram.*, 165. Root biennial, fibrous; culm simple, erect, 1'-2' high; ligules obtuse, 1"-2" long; leaves flat, linear, (1"-3" wide, 2'-4' long,) the radical ones narrower, somewhat scabrous; panicle usually contracted and dense, 2'-4' long, the rays 3-5 or more at each axil, semi-verticillate, flowering from the base, erect; glumes acute or sub-acuminate, scabrous on the back, slightly unequal, 1"-2" long; lower palea usually nearly a half shorter, erose-truncate, very rarely awned above the middle, glabrous or a little hairy at base, the upper one a little smaller than the ovary.—Colorado, *Vasey*.

AGROSTIS CANINA, L.—*Hall & Harbour*, 671.

AGROSTIS VULGARIS, With.—Cañon City, *Brandegee*. *Hoopes*.

MUHLENBERGIA PUNGENS, Thurber, *Proc. Acad. Phil.*, March, 1863, p. 78, *Note*. Culm from a creeping root-stock, 1^o-1½^o high; leaves rigid, convolute, pungent, spreading, 1'-1½' long, less than 1' wide; ligule short, ciliate; panicle 3'-4' long; branches solitary, scattered, naked at base, fasciculately branching; pedicels capillary, minutely scabrous, many times longer than the spikelets, awn 2½' long; glumes almost equal or nearly equal, acuminate or bristly-apiculate, ½ shorter than the flower; palets naked, furnished with a minute rudiment; lower palet scabrous, acute, produced into a long, rough awn, (½'-1') upper palet scarcely shorter; nerves excurrent, two-bristled; stamens 3.—*Hall & Harbour*, 632.

MUHLENBERGIA GRACILLIMA, Torr. *Bot. Whipl.*, *Pacif. R. R. Rep.* 4, p. 155. Caespitose, glabrous; culm simple, 6'-12' high; leaves very narrow, involute, short, 1'-1½', mostly in radical tufts; ligule elongated, cleft; panicle 5'-4' long, pyramidal, capillary; branches sub-solitary, widely spreading; pedicels nearly twice longer than the spikelet; spikelets lanceolate, mostly purplish, 1½' long; glumes acute, lanceolate, scarcely twice shorter than the palets; lower palet glabrous, 3-nerved, minutely bifid, with a straight awn of equal length; callus naked.—On the plains.—*Hall & Harbour*, 642. Colorado Springs, *Porter*. Cañon City, *Brandegee*.

MUHLENBERGIA GRACILIS, Trib. *Stend. Glum.*, 179. Root fibrous; culm erect, slender, branching from the base, 1^o-1½^o high, minutely scabrous, as well as the sheaths; node smooth; leaves erect, narrowly linear, 1'-4' long, plane or convolute, rigid, retrorsely scabrous; panicle contracted, 3'-6' long; branches solitary, appressed; pedicels very short or equaling the spikelet; lower glume 1-nerved, acute, upper 1-nerved, erose-obtuse or acute, sometimes bearing an awn, twice longer than the palets or a little shorter; lower palet wholly pilose, or the middle of the back and margins, bearing an awn 4'-9' in length, upper one on the nerves short-pilose half-way up.—*Hall & Harbour*, 664; *Canby*; *Brandegee*; *Meehan*. Ute Pass and South Park, *Porter*.

MUHLENBERGIA TEXANA, Thurb. in *Gram. Mex. Bound. ined.* "Culms geniculately decumbent, branching; panicle ovoid, few flowered, rays solitary or in pairs, naked below, pedicels equaling or twice as long as the spikelets; glumes shorter than the floret, carinately 1-nerved, setaceous mucronate; palets pilose, the lower terminated by an awn thrice its length and equaled or exceeded by the upper one; callus conspicuous, glabrous.—This species, which seems to be very common in Texas and Arizona, is quite distinct in habit from others of the genus. The slender and branching culms are from one to two feet long, often decumbent for their whole length and geniculate at the nodes; sheaths usually shorter than the internodes, mostly smooth; ligule ½' long, lacerate; leaves (except in specimens from the arid table-lands of Arizona) plane, 1'-1½' long, 3' wide at base, setaceous acuminate at apex, and scabrous, especially above; panicle about 3' long and 2' broad, green or dark-red, included at base except when old, its branches naked below for ¼ or ½ their length and 1-3 flowered; spikelets 1½' long; glumes narrowly lanceolate, upper slightly longer.—Texas, *Bigelow*; *Parry*; *Wright*, 734. Arizona, *Hayes*; *Coues*; *Palmer*." Fremont County, Colorado, *Brandegee*; *Greene*.

MUHLENBERGIA SYLVATICA, T. & G., var. (?) *SETIGLUMIS*, Watson, *King's Rep.* Culms 1^o high, nearly erect; panicle contracted nearly as in *M. glomerata*; the branches solitary and densely flowered, mostly to the base; glumes attenuate into a scabrous bristle, 2½'-3' long; the palet,

with its awn, about twice longer.—Denver, *Dr. Smith*. Cañon City, *Brandegee*.

VASEYA¹ COMATA, Thurber. *Proc. Acad. Phil.*, March, 1863, p. 79. Culms 1^o-2^o high, erect, slender, from a creeping rhizoma, retrorsely pubescent at the nodes; sheaths scabrous, as long as the internodes; ligule short, fringed; leaves 3'-4' long, dull green, rough on both sides; panicle lead-colored, 3'-4' long; branches solitary, appressed, densely flowered; spikelets short-pedicelled, compressed, 1½" long, pubescent; glumes narrow, very acute, serrulate on the keel, lower one a little longer; awn rough and flexuose, purplish, 3"-4" long.—*Hall & Harbour*.

CALAMAGROSTIS CANADENSIS, Beauv.—Cañon City, *Brandegee*. Twin Lakes and Sierra Madre Range, *Coulter*.

CALAMAGROSTIS STRICTA, Trin.—Cañon City, *Brandegee*. Divide between Denver and Colorado Springs, *Porter*.

CALAMAGROSTIS SYLVATICA, DC. *Gray, Proc. Am. Acad.* 6, p. 80. Root creeping; culm simple, erect, rather rigid, glabrous or scabrous below the panicle; leaves mostly revolute, scabrous; panicle contracted, 2'-4' long, the branchlets erect; glumes ovate-lanceolate, sharply acuminate, about 3" long; lower palet scabrous, rather rigid, awned near the base, hairs about one-fourth as long as the palet; rudiment elongated, plumose; awn bent and twisted, exceeding the glumes.—Denver, *Dr. Smith*; *B. H. Smith*; *Canby*. Cañon City, *Brandegee*. Along the Platte, *Coulter*.

CALAMAGROSTIS LONGIPOLIA, Hook.—Near Denver, *Dr. Smith*. Colorado Springs, *Porter*. Sierra Mojado, *Brandegee*.

ORYZOPSIS MICRANTHA, Thurber. (*Urachne micrantha*, Trin.) "Leaves linear-setaceous, convolute; branches of the panicle in pairs, many-flowered; spikelets shining, florets smooth, a little shorter than the linear, acutish glumes, awn about thrice longer than the glumes; cells of the anthers naked at the apex."—*Steud. Glum.*, 122.—*Hall & Harbour*, 634. Chiann Cañon and Glen Eyrie, *Porter*.

ERIOCOMA² CUSPIDATA, Nutt. Perennial; culms 1^o-2^o high, simple, rather rigid and somewhat scabrous; sheaths scabrous, equaling the internodes, the upper ones often dilated; leaves narrow, convolute, elongated, (2'-18'); panicle frequently included at base, dichotomously branched, the spikelets solitary upon capillary peduncles; glumes 2½"-4" long, usually more or less purple, pubescent; outer palet deep brown, 1½" long, the nearly straight triquetrous awn 1½"-2" long.—*Hall & Harbour*, 633. Cañon City, *Brandegee*. On the plains and in the mountains, *Porter*. Platte River, near Denver, *Dr. Smith*.

STIPA MONGOLICA, Turcz. (*Ptilagrostis Mongolica*, Griseb. in *Ledeb. Fl. Ross.*)—Slender, 1^o high, with filiform leaves and a loose few-flowered panicle; the membranous glumes obtuse, about 2" long, sub-equal, pubescent.

¹VASEYA, Thurber. Spikelets 1-flowered, membranous-herbaceous, in a narrow crowded panicle. Glumes 1-nerved, equaling or exceeding the flowers, nearly equal, the lower usually a little longer. Callus oblique, densely bearded with silky hairs equaling the flower. Palets equal, the lower 3-nerved, attenuate into a long awn, the upper acuminate. Stamens 3. Ovary stipitate. Stigmas plumose with long simple hairs. Perennial from running root-stocks.

²ERIOCOMA, Nutt. Spikelets 1-flowered, in a loose, open panicle. Glumes thin, nearly equal, strongly 3-nerved, subventricose at base, attenuate-rostrate above, somewhat exceeding the persistent flower. Callus short, thick. Palets rigid, coriaceous, the outer oval, densely covered throughout with long, white, silky hairs, and terminated with a short, stout deciduous awn, the upper included, narrower, scarcely shorter. Stamens 2-3; anthers oblong-linear, bearded at the apex. Scales conspicuous, nearly equaling the oblong seed.

plish, and the scarcely shorter hairy palet ending in a bent plumose awn, 6" in length.—*Hall & Harbour*, 648.

STIPA SPARTEA, Trin.—Colorado Springs, *Porter*. South Park, *Canby*. *Meehan*. Wet Mountain Valley, *Redfield*.

STIPA VIRIDULA, Trin., *Steud. Gram.*, 129. Culms stout, strict, and with the narrow sheaths scabrous or sometimes glabrate, 1°-3½° high, the nodes naked; leaves elongated, mostly narrow and involute, 1"-3" broad, scabrous; panicle narrow, contracted, 3'-10' long, the erect branches 2-3 together, flowering from the base or some of them naked below; glumes nearly equal, 3"-4½" long, narrowly acuminate; lower palet 2½"-3" long, short-pilose at the obtusish base, appressed-pubescent above, and with a pilose crown at the apex; awn about 1' long, twisted and geniculate, minutely scabrous.—*Hall & Harbour*, 626. Near Denver, *Dr. Smith*. Cañon City, *Brandege*. *Meehan*. Colorado Springs, *Porter*.

ARISTIDA PURPUREA, Nutt. *Steud. Gram.*, 134. Perennial; culms 6'-15' high, simple, erect, slender, mostly glabrous; sheaths narrow, scabrous, exceeding the internodes, pilose at the throat; leaves very narrow, convolute, ½'-10' long; panicle slender, erect or flaccid, 3'-6' long, loosely few-flowered; glumes purplish, the upper 6"-9" long, about twice exceeding the lower, and longer than the flower, bifid and shortly awned; flower densely short-pilose at the pointed base, scabrous above, 6" long, the awns equal or nearly so, separate to the base, not jointed, 1"-2" long, scabrous.—*Hall & Harbour*, 652. Near Denver, *Dr. Smith*. Cañon City, *Brandege*. Colorado Springs and South Park, *Porter*.

ARISTIDA OLIGANTHA, Mx.—Cañon City, *Brandege*.

SPARTINA CYNOSUROIDES, Willd.—Near Denver, *Dr. Smith*.

SPARTINA GRACILIS, Trin., *Steud. Gram.*, 214. Culms 1°-3° high, exceeding the spreading distichous leaves, which are very rough upon the margins, mostly convolute, the upper ones distant and shorter; ligules ciliate; spikes 4-10, oblong, mostly sessile, appressed to the nearly smooth rachis; glumes very unequal, the lower acuminate, the upper acute and equaling the obtusish paleas, 4" long, the glumes and lower palet ciliate, hispid upon the keel.—*Hall & Harbour*, 639. Cañon City, *Brandege*. South Park, *Porter*. In saline soils.

PLEURAPHIS JAMESII, Torr. *Steud. Gram.*, 218. Roots perennial, creeping; culms 1°-1½° high, branching at base, erect, slender, slightly scabrous, hairy at the nodes, with the leaves glaucous; sheaths close, scabrous, hairy at the throat, the ligule lacinate; leaves 1'-6' long, mostly convolute, rigid, scabrous, the upper ones short and pungent; spike 2'-3' long, erect, the internodes of the flexuous rachis shorter than the erect (4" long) spikelets; flowers short-pedicelled or nearly sessile in the glumes; glumes of the perfect spikelet ciliate, carinate, cleft nearly to the middle, the lobes 1-nerved on the inner margin, with 3-5 intermediate bristles, the central one longer; paleas exceeding the glumes, the lower 3-nerved, bifid at the apex, short-cuspidate, the upper a little shorter, 2-nerved and slightly bifid; scales linear, entire; glumes of the sterile spikelets equaling the paleas, the lower ciliate, slightly 2-cleft,

¹*PLEURAPHIS*, Torr. Flowers spicate; the spikelets sessile by threes at each joint of the rachis, surrounded at base by an involucre of soft, spreading hairs; the lateral ones staminate, the central perfect. Glumes of the perfect spikelets 2, 1-flowered, equal, narrow-cuneate, deeply 2-cleft, 3-5 bristled; paleas membranous, the lower short-awned at the apex. Glumes of the sterile spikelets 2, 2-flowered, lanceolate, inequilateral, the lower 1-awned upon the back; paleas membranous, awnless. Stamens 3, with very short filaments. Germ ovate; styles 2, distinct, the elongated stigmas simply plumose.

Stipa pennata Globe Spring Lamborn
Stipa conata " " "

awned above the middle, the outer side 2-nerved, the inner margin much narrower and infolded, the upper glume emarginate or crose, cuspidate with a strong mid-nerve, the broader outer side also 2-3-nerved; palea emarginate or irregularly toothed at the apex, the lower 3-nerved, the upper 2-nerved.—*Greene*.

BOUTELOUA OLIGOSTACHYA, Torr.—*Hall & Harbour*, 636. Near Denver, *Dr. Smith*. *B. H. Smith*. Colorado Springs, *Porter*. Cañon City, *Brandegee*. Common on the plains.

BOUTELOUA HIRSUTA, Lag.—South Park, *Canby*.

BOUTELOUA CURTIPENDULA, Gray.—*Hall & Harbour*. Colorado Springs, *Porter*.

*BUCHLOE*¹ *DACTYLOIDES*, Engelm.—*Trans. Saint Louis Acad.*, vol. 1, p. 432, pl. 12 and 14. Densely tufted, spreading by stolons, forming broad mats; culms 3'-6' long; flowering stems of the male plant 4'-6' long, glabrous or slightly hairy; leaves 2'-4' long, $\frac{3}{8}$ "-1 $\frac{1}{2}$ " wide, nearly smooth; sheaths striate, glabrous, strongly bearded at the throat; spikes 3'-6' long; spikelets alternate in 2 rows, uppermost abortive, bristle-form, 2'-3' long; lower glume ovate-lanceolate, with a scarious margin; upper glume twice longer, ovate; lower palea convex, 3-nerved, upper one 2-nerved, two minute scales at the margin and inside of the lower palea; stamens 3. Stems of the female plant much shorter than the leaves, 1 $\frac{1}{2}$ '-2' high; heads 3'-3 $\frac{1}{2}$ " long; glumes becoming ligneous; spikes or heads usually 2; at maturity becoming thick, extremely hard, including the loose grain.—The celebrated "buffalo-grass," known to hunters and trappers as one of the most nutritious grasses, on which for a part of the year subsist and fatten the immense herds of buffalo and the cattle of the hunter and emigrant. It extends on the elevated plains from the British Possessions southward and westward into Mexico and New Mexico. Nuttall, who had only the male plant, referred it to the genus *Sceleria*, and described it as *S. dactyloides* (*Gen.* 1, p. 64.) Steudel founded another genus on the female plant, *Antephora axilliflora*, (*Glum.* 1, p. 111.) The true relationship between them was first detected by Dr. Engelmann, and clearly set forth by him in his masterly article in the *Trans. Saint Louis Acad.* Plains around Denver, *Dr. Smith*. *Hall & Harbour*, 637.

*MUNROA*² *SUARROSA*, Torr. *Bot. Whipple*, *Pacif. R. R. Rep.* 4, p. 158.

¹ *BUCHLOE*, Engelm. Flowers dioecious, heteromorphous.—*Male plant*. Spikes 1-sided 2-ranked; spikelets 2-3-flowered. Glumes 3, 1-nerved, lower much smaller. Palea 2, of equal length, longer than the glumes; lower one 3-nerved, mucronate; upper one 2-nerved. Squamule in pairs, truncate, emarginate. Stamens 3; anthers linear. Rudiment of an ovary none.—*Female plant*. Spikes 1-3, short, capitate, oblique in the involucre sheaths of the upper leaves; spikelets 1-flowered, crowded, upper floret abortive, withering. Glumes 2; lower glume of the lowest spikelets 1-3 nerved, lanceolate-subulate, with an herbaceous tip, or 2-3-cleft, lower side adnate to the back of the upper glume; lower glumes of the other spikelets (internal as to the head) free, much smaller, membranaceous, ovate-lanceolate, acute, 1-nerved; upper glumes (external) connate at the base with the thickened rachis, at length like a hard, woody involucre, ovate, nerveless, pale, trifid at the herbaceous, nerved tip. Lower palea (internal as to the head) shorter, 3-nerved, herbaceous, tricuspidate; upper palea shorter, 2-nerved. Squamule as in the male flowers. Rudiments of the stamens 3, minute. Ovary lenticular, glabrous, very short-stipitate; stigma much longer than the 2 erect terminal styles, plumose with simple hairs, exert from the apex of the flower. Caryopsis free, included in a berry, at length deciduous head, subenticular, flat on the outside, (toward the lower palea,) convex on the inner side.

² *MUNROA*, Torr. Spike capitate, leafy; spikelets 3, 2-6-flowered; flowers sessile; 2-ranked; terminal one abortive. Glumes 2, subopposite, much shorter than the flowers, mucronate. Palea 2, herbaceous, rigid, in the lowest spikelet naked, mucronate or short-awned, not keeled, equilateral, in the uppermost spikelet bearded toward the base; caryopsis very smooth, covered by the upper palea.

Annual, creeping, very much branched from the base; branches fasciculate, 3'-8' long; leaves 1'-2' long, flat, 1''-2'' wide, somewhat pungent, scabrous on the margin; spikelets mostly 3, closely approximated; 3-4-flowered; glumes almost unilaterial, linear-lanceolate, carinate; palets 2-3 times longer than the glumes, lanceolate, acute, upper one bicarinate, rather obtuse.—On the plains, *Hall & Harbour*, 638. Colorado Springs, *Porter*. Denver, *Dr. Smith*, *Cañon City*, *Brandegee*.

LEPTOCHLOA FASCICULARIS, Gr.—*Hall & Harbour*, 644.

TRICUSPIS PURPUREA, Nutt.—*Hall & Harbour*, 645.

TRICUSPIS MUTICA, Torr. *Bot. Whipl.* p. 156. Cæspitose, glabrous, 1° high; culm rigid, terete, erect, very simple; leaves convolute-filiform, 3'-6' long; panicle terminal, much exserted, racemose, 3'-6' long, the short, appressed branches bearing 3-5 spikelets; spikelets rather terete, 5-8-flowered, glumes unequal, 1-nerved, rather acute, scarcely half the length of the spikelets; lower palet awnless, entire or bifid, long ciliate on the margin and back; upper palet $\frac{1}{2}$ shorter than the lower, notched at the apex, plumose on the margin; style short; stigmas plumose, purple.—*Cañon City*, *Greene*, 1873.

TRICUSPIS ACUMINATA, Munro, in *Herb. Thurb.* "Culms cæspitose, simple, usually with but a single node, which bears a very short leaf; panicle dense, ovoid; spikelets sessile, 8-12 flowered, the rachis easily disarticulating; glumes acuminate, 1-nerved, the upper subaristate and with the palets carinately compressed; lower palet 3' long, acuminate, membranaceous, 3-nerved, marginal nerves terminating at the scarcely bifid apex, the central one prolonged into a seta $\frac{1}{2}$ the length of the palet, which is densely silky below and somewhat pilose above the marginal nerves, with a conspicuously silky tuft near the base; upper palet ovate, obtuse, $\frac{1}{2}$ shorter than the lower; stamens 3; ovary stipitate; styles plumose with simple hairs; squamulae 2, fleshy, truncate; seed fusiform, smooth, shining and translucent, except the scutellum, which is nearly half its length.—This exceedingly neat and interesting species is apparently a perennial, forming tufts with culms 6' to 1° or more high, somewhat rigid, compressed, and often geniculate at base; nodes red; sheaths much shorter than the internodes, with a pilose tuft at the throat; ligule minute, lacerate; the pale-green leaves plane or canaliculate, rigid, distinctly 3-nerved, pubescent, scabrous on the margins, obtuse and mucronulate at apex; radical leaves 2' and those of the culm $\frac{1}{2}$ long; panicle 1'-2' long with a few erect 1-3 flowered branches, whitish or with a very slight purple tinge; the broad palets (at least when dry) nearly colorless, with green nerves and beautifully silky hairs upon the lower portion and marginal nerves; upper palet bicarinate, ciliate on the nerves and conformed to the lower one.—The plant has something of the habit of *Tricuspis (Uralapis) arenacea*, Kth., and has been mixed with it by collectors, but is readily distinguished by its larger and many-flowered spikelets and its carinate, acuminate, and mostly entire lower palet.—Texas, *Linahimer*, 738; *Bigelow*; *Wright*, 781, 782, (in part) and 2058. New Mexico, *Fendler*, 915. *Cañon City*, Colorado, *Brandegee*; *Greene*, 1873.

GRAPHEPHORUM (?) FLEXUOSUM, Thurber *Proc. Acad. Phil.*, March, 1863, p. 78, *Note*. Culm 3° high, smooth; sheath surpassing the internodes, furnished with a ring of hairs instead of a ligule; leaves 1 $\frac{1}{2}$ ° long, 2'' broad, setaceous-acuminate; panicle loosely-flowered; branches scattered, the lowest distant, about 4' long, naked below, branchlets few, capillary; spikelets ovate, compressed, 3-6 flowered, 2 $\frac{1}{2}$ ''-3' long, twice or four times shorter than the pedicels; glumes membranaceous, 1-nerved,

acute, half shorter than the spikelet; lower palea carinate, 3-nerved, (with prominent lateral nerves,) scabrous-pubescent, crose-denticulate at the apex, mucronate, villous at base, upper one about as long, conspicuously 2-keeled, 2-toothed; stamens 3; ovary stipitate; squamulae 2, obliquely truncate; caryopsis free.—*Hall & Harbour*, 635.

KELERIA CRISTATA, Pers.—Near Denver, *B. H. Smith*. Colorado Springs, *Porter*. Monument Park, Twin Lakes, and on the Upper Arkansas, *Coulter*. *Hall & Harbour*, 650.

MELICA BULBOSA, Geyer. (*M. poaeoides*, Torr. *Bot. Whipl.*, not Nutt.) Gray in *Proc. Am. Acad.*, vol. 8, p. 409. Culms erect, slender, $1\frac{1}{2}$ °-2° high often enlarged and bulb-like at base, slightly scabrous above, nodes, naked; sheaths longer than the internodes and scabrous, the ligules usually long and lacerated; leaves scabrous, mostly flat and elongated, 1"-2" wide; panicle narrow and often interrupted, the branches unequal and erect, subscabrous, rarely spreading; spikelets erect and scarcely second, 3-5-flowered, usually more or less purple; glumes obtuse or acutish, glabrous, 5-nerved; lower palea about 4" long, 7-nerved, puberulent on the back, membranous-margined, rather obtuse, upper palea pubescent on the nerves crose-truncate; grain 2" long.

Var. Culms slender, little enlarged at base, 1° high; leaves narrow and revolute; panicle narrow; spikelets 10-15; glumes longer, more acute; lower palea obscurely 5-nerved, upper palea not pubescent on the margins.—*Ute Pass and Twin Lakes*, *Coulter*.

MELICA MUTICA, Walt., *Gr.*; var. *PARVIFLORA*, *Porter*. Culms 2° high; panicle narrow, 1° long; flowers 3-4, smaller; leaves narrower; spikelet much exceeding the larger glume; pedicels below the flowers more hairy.—*Glen Eyrie*, *Porter*. *Meehan*. Sierra Madre Range, *Coulter*.

GLYCERIA PAUCIFLORA, Presl. *Steud. Gram.*, 285. Roots creeping; culms 1°-3½° high, smooth, nodes naked; sheaths and the broad linear leaves (3'-12' long) scabrous; panicle loosely spreading, the slender flexuous branches in pairs, divided, scabrous; spikelets narrow-oblong, 2" long, 4-6-flowered, often purplish; glumes rounded, unequal, the lower obscurely 3-nerved, scarious on the margin, lower palea truncate-obtuse, the apex minutely serrulate and distinctly scarious, 5-nerved, the upper one emarginate.—*Hall & Harbour*, 662. Cañon City, *Brandegee*.

GLYCERIA AQUATICA, Sm.—*Hall & Harbour*, 629. Monument Park, *Coulter*.

GLYCERIA AIROIDES, Thurber. (*Poa airoides*, Nutt. in *Gen.* 1, p. 68.) Culm 4°-5° high, erect; leaves with very long sheaths, short and acute; panicle erect, attenuated; branches semi-verticillate, few and capillary; spikelets oblong, obtuse, nearly sessile, or upon short peduncles, 4-6-flowered; glumes very unequal, shorter than the paleas; flowers distinct, somewhat cylindric, obtuse, shining, purplish, scarious, and often lacinate at the point, obsolete 5-nerved, inner valve scabrous on the margin.—*Hall & Harbour*, 630. South Park, *Porter*. *Canby*.

GLYCERIA DISTANS, Wahl.—Colorado, *vide Watson*.

CATABROSA AQUATICA, Beauv. (*Glyceria*, Presl., *Steud. Gram.*, 286.)

CATABROSA, Beauv. Spikelets 2-3-flowered; flowers equal, perfect. Glumes membranous, colored, unequal, shorter than the flower, concave, the lower oblong, 1-nerved, the upper obovate, 3-nerved, coarsely dentate at the apex, or both nerveless. Paleas membranous, equal in length, the lower 3-nerved and 3-keeled, truncate-obtuse, the upper 2-nerved and 2-keeled, rounded and somewhat 3-lobed. Stamens 3. Styles 2, very short; the stigmas plumose. Scales 2, shorter than the ovary. Grain oblong, free, shortly pedicelled.—Glabrous, creeping aquatic, with flat leaves, elongated membranous ligules and diffusely branched panicles with semi-verticillate branches; flowers jointed at base and deciduous.

Culms 4'-2° high, rather stout, ascending; leaves 2'-4' long, 2''-4'' wide, scabrous on the margin; panicle uniform, branchlets numerous, divided; glumes ½'' long, purplish; flowers 1'' in length, light brown in color.—*Hall & Harbour*, 663. Wet Mountain Valley, *Brandegee*.

BRIZOPYRUM SPICATUM Hook, var. *STRICTUM*, Gray. (*Uniola stricta*, Torr. *Stead. Gram.*, 281.) Spikelets many-flowered, and the panicle mostly rather loose and elongated, 1½'-3½' in length; culms ½°-2° high; pistillate spikelets 4''-8'' long, 4-13-flowered, the lower palea acutish or almost acuminate; staminate spikelets 4''-9'' long, 6-18-flowered, slender-pedicled and often somewhat nodding.—*Hall & Harbour*, 640. South Park, *Porter*.

POA ALPINA, L.—*Hall & Harbour*, 674. Mt. Lincoln, at 12,500 feet altitude, Weston's Pass, at 11,000 feet, and White House Mountain, at 11,500 feet, *Coulter*.

POA CAESIA, Sm., var. *STRICTIOR*, Gr.—On Pike's Peak, *Canby*. Along the foothills, *Coulter*.

POA SEROTINA, Ehrh.—*Hall & Harbour*, 672. Ute Pass, *Porter*. Weston's Pass, *Coulter*.

POA TENUIFOLIA, Nutt. Tufted, 1°-2° high; culm slender, erect, glabrous or with the sheaths and leaves more or less scabrous; leaves narrowly linear, 1'-4' long; ligules short; panicle erect, narrow and rather close, 2'-4' long, the branchlets 2-5 together and scabrous; glumes 2''-2½'' long, acute or acutish, a little scabrous on the mid-vein, 3-4-flowered; lower palea 2'' long, obtuse, nearly glabrous, puberulent or somewhat pubescent at base, but little compressed; flowers readily separating at the joints.—*Hall & Harbour*, 668 and 675.

POA ANDINA, Nutt. In dense perennial tufts, glabrous excepting the more or less scabrous panicle; culms 4'-2° high, slender, erect; leaves very narrow, 1'-3' long, mostly revolute; ligules ½''-2'' long, acuminate; panicle narrow or linear, strict, 1'-2½' long, the branches 2-3 together; spikelets 2-3 flowered; glumes 1½''-2'' long, acute or acutish, a little scabrous on the midvein; paleas 1½'' long, pubescent, villous at base, the lower one obscurely nerved, but little compressed.—Near Long's Peak, June, at 8,000 altitude, and Mount Lincoln, at 13,000 feet, *Coulter*.

ERAGROSTIS PURSHII, Beruh.—Near Denver, *Dr. Smith*.

FESTUCA OVINA, L. *Meehan*. Cañon City, *Brandegee*. Clear Creek, *Porter*. Denver, *Dr. Smith*.

Var. *DURIUSCULA*, Gr.—*Hall & Harbour*, 665. Twin Lakes, *Porter*. East River, Taylor River, and White House Mountain, at 13,000 feet altitude, *Coulter*.

Var. *BREVIFOLIA*, Watson. (*F. brevifolia*, Br., *Stead. Gram.*, 313.) *King's Rep.*, vol. 5, p. 389. Tufted; culms low and slender, 4'-8' high; leaves setaceous and sheaths glabrous, the uppermost leaves often very short and the sheath rather loose; panicle racemose and nearly simple, erect, 1'-2' long; spikelets 1'-4'-flowered; flowers terete, somewhat scabrous, about 2'' long, twice the length of the awn.—*Hall & Harbour*, 666. *Ferry*, 373. Near Denver, *Dr. Smith*. Twin Lakes, *Porter*. Along the Platte, *Coulter*.

BROMUS KALMII, Gr., var. Culm 12'-18' high, smooth; sheaths and leaves minutely scabrous; panicle 6' long, compound, branches minutely downy; spikelets 1' long, canescent with short appressed silky hairs

7-9-flowered; glumes 3"-4" long, each 3-nerved, obtuse; lower palet 5" long, 7-nerved, awn 1½" long.—Twin Lakes, *Porter*. Buffalo Peaks and Sierra Madre Range, *Coulter*.

BROMUS CILIATUS, L.—Divide between Denver and Colorado Springs, *Porter*. Wet Mountain Valley, *Brandege*.

PHRAGMITES COMMUNIS, L.—Near Denver, *Dr. Smith*.

TRITICUM REPENS, L.—*Hall & Harbour*, 655. Denver, *Dr. Smith*. B. H. *Smith*. Cañon City, *Brandege*. *Meehan*. Along the Platte and on Weston's Pass, *Coulter*. Known as "blue-joint."

TRITICUM CANINUM, L.—*Hall & Harbour*, 680.

TRITICUM STRIGOSUM, *Steud. Gram.*, 347. (*Bromus*, *Bieb. T. agiloides*, *Turcz.*) Resembling the last, but glaucous, the leaves narrow and revolute; spike narrow-linear, with the spikelets shorter than the joints or but little exceeding them; glumes obtuse or acutish, or sometimes acuminate.—*Hall & Harbour*, 637. Ute Pass, *Porter*. Plains of the Platte, *Coulter*. *Canby*.

LEPTURUS PANICULATUS, *Nutt.*—Denver, *Dr. Smith*. Colorado Springs, *Porter*. Fremont County, *Brandege*.

HORDEUM JUBATUM, L.—Denver, *Dr. Smith*. B. H. *Smith*. Colorado Springs and South Park, *Porter*. Cañon City, *Brandege*. Plains of the Platte, *Coulter*. A common and showy grass, the panicles often being purplish. *Denver &*

HORDEUM PRATENSE, *Huds.*—Colorado Springs and South Park, *Porter*. Plains of the Platte, *Coulter*.

ELYMUS CANADENSIS, L.—Colorado Springs, *Porter*.

ELYMUS CONDENSATUS, *Presl. Steud. Gram.*, 351. Culm stout, 3°-8° high, roughish-puberulent and short-pubescent at the nodes or nearly glabrous; spike 3'-15' long, erect, exerted, or sheathed at base, sometimes close-paniculate; spikelets 2-6 together, 3-10-flowered, puberulent or nearly glabrous, exceeding the internodes of the pubescent rachis; glumes setaceous-subulate from a very narrow base, 4"-5" long; flowers 4' long, acute or short-awned, or barely acutish, the upper palet 2-toothed.—*Hall & Harbour*, 654.

ELYMUS SITANION. *Schult.*, (*Sitanion elymoides*, *Raf.*, *Steud. Gram.*, 351, and *Polyantherix Hystris*, *Nees. Steud. Gram.*, 356.) Culms 4'-2° high, tufted, and with the leaves and sheaths glabrous or somewhat pubescent or scabrous; spike erect, 1'-3' long, squarrose with its long recurved awns, jointed and fragile at maturity; spikelets in pairs, 2-5-flowered, smooth or puberulent; glumes entire or usually parted to the base and the segments unequally 2-cleft, the divisions long-awned, (1'-3';) flowers 3" long, the awn of the lower palet equaling that of the glumes, with often a subsidiary awn or tooth on each side at the apex of the palet.—*Hall & Harbour*, 679. Cañon City, *Brandege*. Mountains west of Denver, *Porter*. Twin Lakes, *Coulter*.

DANTHONIA SERICEA, *Nutt.*—*Hall & Harbour*, 622; *Meehan*. Ute Pass, *Porter*. Along the Platte, *Coulter*. Wet Mountain Valley, *Redfield*.

AVENA STRIATA, *Mx.*—*Hall & Harbour*, 623.

TRisetum subspicatum, *Beauv.*—*Hall & Harbour*, 625; *Canby*. Gray's Peak, *Dr. Smith*. Sangre de Cristo Pass, *Brandege*. Mount Lincoln, at 13,000 feet altitude, Weston's Pass, Twin Lakes, Divide at the head of Lake Creek at 12,000 feet altitude, and White House Mountain, at 12,000 feet, *Coulter*.

AIRA CESPITOSA, L.—South Park, *Porter*. Near Denver, Mount Lin-

coln at 12,000 feet, Weston's Pass, Twin Lakes and Sierra Madre Range, Coulter.

AIRA DANTHONIOIDES, Trin. *Steud. Gram.*, 221. Annual, glabrous; culms very slender, 3'-3^o high, geniculate at base; sheaths smooth, exceeding the internodes; ligules elongated; leaves short ($\frac{1}{2}$ '-4') and very narrow or convolute-setaceous; panicle diffuse, the capillary branchlets 2-4 together and naked below; glumes 2-flowered, with the plumose rudiment of a third, 2''-3'' long, exceeding the flowers; lower palea truncate and denticulate, 1''-1 $\frac{1}{2}$ '' long, awned below the middle, the awn 2''-4'' long, geniculate; grain free, flattish, not grooved.—Summit of Gray's Peak, *Dr. Smith*.

HIEROCHLOA BOREALIS, R. & S.—*Hall & Harbour*, 628. Cañon City, *Brandege*. Clear Creek cañon, *Coulter*.

PHALARIS ARUNDINACEA, L.—Cañon City, *Brandege*.

PASPALUM SETACEUM, Mx.—*Hall & Harbour*, 653.

BECKMANNIA¹ ERUCÆFORMIS, Host. *Steud. Gram.*, 15. Culms stout, 1^o-3 $\frac{1}{2}$ ^o high, erect from an ascending base, with the sheaths glabrous; ligules elongated; leaves linear, 4'-8' long and 2''-6'' wide, flat, acute, scabrous; panicle 4'-12' long, erect, strict, secund, the short, crowded branchlets densely flowered from the base, glabrous; spikelets sessile, imbricately arranged in two rows, nearly orbicular, 1 $\frac{1}{4}$ '' in diameter, the upper rudimentary floret minute, stipitate.—*Hall and Harbour*, 658. Near Denver, *Dr. Smith*.

PANICUM CAPILLARE, L.—Cañon City, *Brandege*.

PANICUM VIRGATUM, L.—Near Denver, *Dr. Smith*.

PANICUM AMARUM, Ell.—Cañon City, *Brandege*.

PANICUM PAUCIFLORUM, Ell.—Cañon City, *Brandege*.

PANICUM CRUS-GALLI, L.—Near Denver, *Dr. Smith*. Cañon City *Brandege*.—Introduced.

SETARIA VIRIDIS, Beauv.—Cañon City, *Brandege*.—Introduced.

SETARIA ITALICA, Kunth.—Cañon City, *Brandege*.—Introduced.

CENCHRUS TRIBULOIDES, L.—Cañon City, *Brandege*.

ANDROPOGON FURCATUS, Muhl.—Divide between Denver and Colorado Springs, *Porter*.

ANDROPOGON SCOPARIUS, Mx.—Cañon City and Wet Mountain Valley, *Brandege*.

ANDROPOGON ARGENTEUS, Ell.—*Hall & Harbour*, 651. Cañon City, *Brandege*.

SORGHUM NUTANS, Gray.—Cañon City, *Brandege*.

EQUISETACEÆ.

EQUISETUM ARVENSE, L.—Near Denver, *Dr. Smith*. Clear Creek, *Coulter*.

EQUISETUM PRATENSE, Ehrh.—Mt. Lincoln, Twin Lakes and Sierra Madre Range, *Coulter*.

¹ BECKMANNIA, Host. Panicle racemose, contracted. Spikelets compressed, 2-flowered, the upper floret an abortive rudiment. Glumes 2, obovate, compressed boat-shaped, subcoriaceous, equal, a little shorter than the flower, pointless. Palea membranous, the lower ovate, concave, acutish, mucronate, 3-nerved, the upper 2-nerved, blind. Stamens 3. Styles 2, with elongated plumose stigmas. Scales 2, blind, glabrous. Grain free, glabrous.—A coarse perennial aquatic.

E. nycotale
 EQUISETUM LAEVIGATUM, Braun.—Near Denver, Dr. Smith; Porter. Saint Vrain Cañon and Clear Creek, Coulter.

EQUISETUM VARIEGATUM, Schleicher.—Clear Creek, near Denver, Coulter.

FILICES.

POLYPODIUM VULGARE, L.—Hall & Harbour, 694. Grand Cañon of Arkansas, Brandegee.

PTERIS AQUILINA, L.—Along the Platte, and in the Sierra Madre Range, at 10,000 feet altitude, Coulter. Wet Mountain Valley, Brandegee.

CHEILANTHES FENDLERI, Hook. *Spec. Fil.*, 2, p. 103. Small; caudex creeping, scaly; stipes sparse, scattered, slender, brown, scaly with subulate, appressed scales, on the main and secondary rachises the scales more copious, broader, ovate-acuminate, white, glossy brown at the base; fronds 2'-3' long, ovate-lanceolate, subcoriaceous, pale-green, glabrous on both sides, tripinnate; primary pinnules ovate-lanceolate, obtuse, pinnules rather large for the size of the frond, convex, broad-cuneate, sessile, somewhat decurrent, retuse at the apex, entire or 2-3-lobed, the margin of the lobes merely incurved, scarcely confluent and forming the involucre.—Hall & Harbour; Brandegee; Canby. Chiann Cañon and Glen Eyrie, Porter.

CHEILANTHES TOMENTOSA, Link.—Grand Cañon of the Arkansas, Brandegee.

CHEILANTHES LANUGINOSA, Nutt.—Meehan. Grand Cañon of the Arkansas, Brandegee. Chiann Cañon, Porter.

CHEILANTHES EATONI, Baker. *Syn. Fil.*, p. 140. Stipes tufted, 3'-6' in length, wiry, erect, densely clothed with pale brown, linear-subulate scales; fronds 3'-8' in length, 1½'-2' broad, ovate-lanceolate, tripinnatifid; lower pinnae distant, alternate or opposite, deltoid; pinnules linear-oblong, pinnatifid; rachis rigid, covered with scales like the stipe, which also cover thickly the midrib of the pinnae beneath, texture coriaceous, upper surface densely clothed with a white woolly tomentum, lower also densely matted, the margin of the segments incurved.—Grand Cañon of the Arkansas, Brandegee.

NOTHOLENA FENDLERI, Kunze. Stipes densely tufted, 2'-4' long, wiry, chestnut-brown, naked, the scales linear, bright-ferruginous; frond 2'-3' each way, deltoid, tripinnate, all the rachises very zigzag; pinnae, pinnules, and segments all stalked, deltoid; lobes close, oblong, blunt, not more than 1" long, ½" broad; texture subcoriaceous, upper surface naked, lower covered with a fine white powder.—Abundant throughout Fremont County, Brandegee. Chiann Cañon and Glen Eyrie, Porter.

PELLÆA GRACILIS, Hook.—Ten Mile Cañon, below Breckenridge, Brandegee.

PELLÆA ATROPURPUREA, Link.—Glen Eyrie, Porter.

PELLÆA WRIGHTIANA, Hook. (*P. (Allosorus) mucronata*, Eaton. *Sill. Jour.*, July, 1856.) Stipes tufted, 2'-4' long, strong, erect, naked, dark-brown, polished; fronds 3'-6' long, 1'-3' broad, deltoid, bipinnate; pinnae spreading or erect-patent, rigid, 1' or more long, with several distant, linear, oblong pinnules, sterile ones flat, ovate, fertile ones narrowed, revolute on the margins, 3'-4" long, with a sharp, mucronate point; rachis chestnut-brown, polished like the stipe; texture coriaceous, both surfaces naked, pale glaucous-green; involucre broad, coriaceous, rolled permanently over the sori.—Cañon City and vicinity, Brandegee.

CRYPTOGRAMME ACROSTICHOIDES, R. Br. (*Allosorus acrostichoides*,

Spreng.)—*Hall & Harbour*, 688; *Parry*. Wet Mountain Valley, *Brandegee*. Sierra Madre Range, Gothic Mountain and Mountain of the Holy Cross, *Coulter*.

ASPLENIO SEPTENTRIONALE, L. Fronds many from tufted root-stocks, 3'-5' high, on very long stipes, erect; pinnae 2-4, narrow, linear, erect, entire at base, with 2-several setaceous divisions at the summit.—*Hall & Harbour*, 689. Grand Cañon of the Arkansas, *Brandegee*; *Redfield*.

ASPLENIO TRICHOMANES, L.—Grand Cañon of the Arkansas, *Brandegee*.

ASPLENIO EBENEUM, Ait.—Green Horn Mountains, *E. L. Greene*.

ASPLENIO FILIX-FEMINA, Bernh.—*Hoopes*.

PHEGOPTERIS DRYOPTERIS, Fée.—*Hall & Harbour*, 695.

ASPIDIO FILIX-MAS, Swartz. *Hall & Harbour*, 687. Grand Cañon of the Arkansas, *Brandegee*. Along the foot-hills west of Denver, *Coulter*.

CYSTOPTERIS FRAGILIS, Bernh.—*Hall & Harbour*, 690; *Canby*. South Park, *Porter*. Wet Mountain Valley, *Brandegee*. Bear Creek, near Denver, Mount Lincoln, at 12,000 feet altitude, Twin Lakes and White House Mountain, *Coulter*.

WOODSIA SCOPULINA, Eaton. Root-stock short, creeping; stalks 2'-4' high, chaffy at the base, stramineous, puberulent, like the rachis and under surface of the frond, with minute flattened hairs and stalked glands; fronds lanceolate, 4'-8' long, pinnate; pinnae numerous, 8'-10" long, pinnatifid with 10-16 short ovate or oblong crenulate or toothed divisions; indusium very delicate, deeply cleft into laciniae, which terminate in short hairs composed of irregular cylindrical cells.—Colorado, *vide D. C. Eaton*.

WOODSIA OREGANA, Eaton. *Canby*. Chiann Cañon, South Park and Upper Arkansas, *Porter*. *Meehan*. Wet Mountain Valley, *Brandegee*. Long's Peak and Twin Lakes, *Coulter*. Grand Cañon of the Arkansas, *Redfield*.

BOTRYCHIO VIRGINICUM, Swartz.—Grand Cañon of the Arkansas, *Brandegee*.

LYCOPODIACEÆ.

LYCOPODIUM ANNOTINUM, L.—White House Mountain, *Coulter*.

SELAGINELLA RUPESTRIS, Spring.—Sierra Madre Range, *Coulter*. On rocks, in Glen Eyrie and South Park, *Porter*.

MUSCI.

BY LEO LESQUEREUX, Esq.

The mosses here enumerated and described were collected in Colorado Territory, by Elihu Hall in 1865, Major Downie in 1868, Prof. Thos. C. Porter, and by the assistants of Dr. F. V. Hayden and myself in 1872 and 1873. A few mentioned in Hayden's Report of 1872, from the mountains north of Colorado, and in Watson Catalogue, from Utah and the Uintas, all species likely to be found in Colorado Territory, are added. Considering that none of the botanists who have gathered these materials made in their researches a specialty of this class of plants, which mostly grow in deep and dark ravines of difficult

access, and that, too, the eastern slopes of the Rocky Mountains are mostly bare of trees and deprived of atmospheric humidity, the essential food of the mosses, this catalogue is already remarkably rich and interesting in many points.

SPHAGNUM ACUTIFOLIUM, Ehrh., var. *TENERUM*, Sulliv. & Lesqx. *Musc. Bor.-Am.* No. 11.

Hab.—Uinta Mountains, *Porter*. Colorado, *Hall*; *Downie*.

PHASCUM CARNIOLICUM, Web. & Mohr.—A very rare species, found as yet in Carniola and Sardinia only.

Hab.—Western plains of Kansas; upon silex. *Hall*.

PHASCUM CUSPIDATUM, var. δ . *PILIFERUM*, Schreb.

Hab.—Along the Platte. *Hall*.

WEISIA CRISPULA, Hedw.—Immature specimens.

Hab.—Low mountains. *Hall*.

WEISIA CIRRHATA, Hedw. This form approaches the former species. By its capsule and its annulus it is referable to *W. cirrhata*; the leaves, however, are longer, their borders scarcely reflexed, and the articulations of the pale red teeth less marked than in the normal form. An species propria?)

Hab.—Mountains. *Hall*.

GYMNOSTOMUM RUPESTRE, Schwægr.

Hab.—Glen Eyrie, 1872. *Porter*.

DICRANUM GRACILESCENS, Web. & Mohr.

Hab.—On wet rocks; high mountains. *Hall*.

DICRANUM VIRENS, Hedw.

Hab.—On stones in alpine brooks, near snow-range; not rare.

DICRANUM PELLUCIDUM, Hedw., var. *PAGIMONTANUM*, Brid.—The same remarkable variety as found in Vermont.

Hab.—Mountains; (coll. 1873).

DICRANUM VARIUM, Hedw.

Hab.—Base of the mountains. *Hall*.

DICRANUM PUSCESCENS, Thun.

Hab.—Twin Lakes, in pine woods. *Downie*. (Expl. 1873.)

DICRANUM MUELLENBECKII, Bryol. Eur.

Hab.—Roots of trees, pine-region; not rare.

DICRANUM RHABDOCARPON, Sulliv.

Hab.—Alpine; moist places on the ground. *Hall*; *Downie*. A rare species, found in good fruiting specimens, which confirm Sullivant's diagnosis, made from specimens too old, in *Contrib. to Bry.* 1, p. 172, pl. iii.

CAMPYLOPUS HALLI, (*sp. nov.*) Plantæ caespitosa, colore lutescente-virides, sericeo-nitentes; caulis vix pollicaris, pluries dichotomus, basi nudus (non radiculosus). Folia stricta, erecto-subaperta lanceolata, tubulosa, e toto levia, integerrima, nervo latissimo foliam integrum equidem ad basin occupante, cellulis alaribus paucis, rufescentibus quadrato-inflatis.

Hab.—Mountains. *Hall*.

CAMPYLOPUS FRIGIDUS, (*sp. nov.*)

Priori nervo dilatato affinis; differt foliis angustis, longioribus, linearibus, canaliculatis, margine versus apicem denticulatis, dorso scabris.

As in the former species the medial nerve fills the whole leaf except only four alar cells at the base; these cells are round. Two other forms,

one differing from this species by its reflexed leaves, and another with a narrower medial nerve and broader leaves, are considered as mere varieties.

Hab.—Near snow-range, on the ground. *Hall*.

PHAROMITRIUM SUBSESSILE, Schp. *Synops. Musc.*

Hab.—Sand-hills on the plains. *Hall*. Moist sand, base of the hills near Point of Rocks. *Lesqueureux*; (also Explor., 1873).

POTTIA CAVIFOLIA, Hedw.—On the Platte near the mountains. *Hall*.

POTTIA HEIMII, Schp. *Synops. Musc.*

Hab.—Mountains of Colorado; sandy ground. *Hall*; (also Explor. of 1873.)

ANACALYPTA LATIFOLIA, Schwiegr.

Hab.—Tops of rocks in the mountains, *Downie*. Uinta Mountains, *Watson's Catalogue*.

DIDYMODON RUBELLUS, Bryol. Eur.

Hab.—On stone and ground, plains and mountains; common.

DISTICHIMUM CAPILLACEUM, Bryol. Europ.

Hab.—Base of overhanging rocks, high mountains; not rare.

DISTICHIMUM INCLINATUM, Bryol. Eur.

Hab.—Same stations as the former; Bear River Cañon, Uinta Mountains; *Watson's Catalogue*.

CERATODON PURPUREUS, Brid.

Hab.—Everywhere on humected rocks and ground, collected by all the explorations.

LEPTOTRICHUM GLAUCESCENS (Hampe,) Hedw.

Hab.—Mountain slopes near Twin Lakes. *Downie*.

DESMATODON LATIFOLIUS, Bryol. Europ.

Hab.—Mountains of middle altitude in Colorado. *Hall*.

DESMATODON LATIFOLIUS, var. β . GLACIALIS, Bryol. Eur.

Hab.—High mountains near Twin Lakes. *Downie*. (Also in Explor. 1873.)

DESMATODON SISTYLIUS, Bryol. Eur.

Hab.—Near snow-range; mountains of Colorado. *Downie*.—A very rare and fine species, mostly of the glacial regions, like the following one. Both are known from the Dofrafield Mountains of Norway.

DESMATODON LAURERI (Schultz). Bryol. Eur.

Hab.—The same locality as the former. *Downie*.

BARBULA RIGIDA, Schultz.

Hab.—Plains along the Platte; only found sterile. *Hall*.

BARBULA SUBULATA, Brid.

Hab.—Near Salt Lake, on rocks; *Watson's Catalogue*.

BARBULA MUCRONIFOLIA, Schwiegr.

Hab.—Middle elevations; on rocks and banks. *Hall*.—The moss referred to the former species is probably the same as this, which is found all through the Rocky Mountains, and has been distributed in Drummond's collections as *B. subulata*, which, however, chiefly inhabits the plains.

BARBULA RURALIS, Hedw.

Hab.—Low mountains, on dry rocks, &c.; common.

GRIMMIA CONFERTA, Funk.

Hab.—Rocks base of the mountains. *Hall*. (Also Explor. of 1873.)

GRIMMIA APOCARPA, Hedw.

Hab.—Same localities as the former; more common.

GRIMMIA PLAGIOPODIA, Hedw.

Hab.—On rocks; in the mountains. *Hall.*

GRIMMIA TRICHOPHYLLA, Grew.

Hab.—Shaded rocks, in low mountains. *Hall.*

GRIMMIA OVATA, Web. and Mohr.

Hab.—On rocks, mountain region. *Hall.*

GRIMMIA OVATA, var. β . AFFINIS, Bryol. Eur.

Hab.—Same localities as the former. *Hall*; (also Explor. 1873.)

GRIMMIA LEUCOPHLEA, Grev.

Hab.—On flat sand rocks, from the plains to the mountains, (Explor. of 1873.); also abounds at Point of Rocks, Wyoming. *Lesqueureux.*

GRIMMIA CALYPTRATA, Hook.

Hab.—Dry rocks in low mountains. *Hall.*

This moss on the eastern side of the Rocky Mountains is rarely as well developed as in California, and the Sierra Nevada Mountains. The peristome are low and the stems slender.

RACOMITRIUM HETEROSTICHUM, Brid.

Hab.—Humected rocks in the mountains. Found in poor specimens by *Hall*; (also in Explor. of 1873.)

HEDWIGIA CILIATA, Ehrh.

Hab.—On rocks, near the base of the mountains; not rare.

ZYGODON LAPONICUS, Bryol. Europ.

Hab.—Near Sand Lake?, in poor specimens; (Explor. 1873.)

ORTHOTRICHUM HUTSCHINSLE, Smith.

Hab.—On rocks, borders of creeks, base of the mountains; common.

ORTHOTRICHUM ANOMALUM, Hedw.

Hab.—Same stations as the former; more rarely found. *Hall.*

ORTHOTRICHUM HALLII, *Sully. & Lesqx., in Sulliv. Icones, Supplement, Pl. 45.*

Orthotricho strangulato affine; differt foliis superne valde utra facie papillosis; capsula sicca cylindrica, sub ore haud vel vix constricta; calyptra lata capsulam totam tegente, etc.

Hab.—On rocks in the mountains. *Hall.*

ORTHOTRICHUM UTAHENSE, *Sulliv. Mss.*

Priori affine sed robustior; foliis huiusmodi valde papillosis; capsula stomatibus immersis.—The specimens (too old) have not any capsule with the peristome.

Hab.—Ogden Cañon, on shaded perpendicular rocks. *Lesqueureux.*

ORTHOTRICHUM SPECIOSUM, var. *Nees.*

A fine variety with slender stems and male plants entirely covered with thick male buds. The habitat is as remarkable as the form of the plants, it being, as indicated by *Hall*, upon rocks on low mountains, while in the plains the species is only found upon trees.

ENCALYPTA COMMUTATA, *Nees & Hornsch.*

Hab.—High cliffs, near Twin Lakes. *Downie.*

ENCALYPTA VULGARIS, Hedw.

Hab.—Slopes and fissures of rocks; low mountains; common.

ENCALYPTA STREPTOCARPA, Hedw.—Sterile.

Hab.—Glen Eyrie. *Porter.*

ENCALYPTA RHABDOCARPA, Schwægr.

Hab.—Same locality as the former; less frequent.

ENCALYPTA RHABDOCARPA, var. ?

Foliis piliferis, areolatione compacta, papilloso-rugosa; capsula sub-

striata sicca plicato-striata, apophysata; peristomio nullo; calyptra longiori fusca, apice rugosa.

This form is referable, by its leaves and the ribbed capsule, to *E. rhadocarpa*; by the absence of peristome to *E. vulgaris*, and by the apophysate capsule to *E. apophysata*, N. & H. It is apparently a new species. The specimens, however, are too few and incomplete for a satisfactory diagnosis.

Hab.—High mountains. Mixed with *Desmatodon sistylius*.—*Downie*.

DISSODON FRÆLICHIANUS, Frœl.

A fine and rare species found in good specimens.

Hab.—Mountains of Colorado. *Hall*.

DISSODON HORNSCHUCHII, Grev., Arn.

Hab.—Near Twin Lakes. *Downie*.

TAYLORIA SPLACHNOIDES, Hook.

Hab.—Same locality as the former. *Downie*.

PHYSCOMITRIUM TETRAGONUM, Brid.

Hab.—Moist sandy soil on the plains. *Hall*. A very rare species, found only once before in this country.

PHYSCOMITRIUM PYRIFORME, Brid.

Hab.—Moist ground, on the plains and in the mountains.

FUNARIA HYGROMETRICA, Hedw.

Hab.—Humected rocks and ground; common.

FUNARIA HYBERNICA, Hook.

Hab.—Mountains of Colorado; (Explor. of 1873.)

LEPTOBRYUM PYRIFORME, (Linn.) Schp.

Hab. Wet ground, under the shade of pines; common.

WEBERA ELONGATA, Schwagr.

Hab.—High mountains; fissures of rocks. *Hall*.

WEBERA NUTANS, Schreb.

Hab.—Shaded ground in the mountains; not rare.

WEBERA CRUDA, Schreb.

Hab.—At the base of overhanging rocks and fissures; not rare.

WEBERA LUDWIGII, Spreng.

Hab.—High mountains; sandy soil along rivulets. *Hall*; *Downie*. (Expl. of 1873.)

BRYUM PENDULUM, (Hornsch.) Schp.

Hab.—On the ground, low mountains; common.

BRYUM PENDULUM, var. MONTANUM. Forma normali differt; capsula gracilliori, obovato-pyriformi, operculo longiori acutiusculo; areolationis foliorum ductibus intercellularibus crassioribus, margine foliorum vix conspicuo concolore, nervo viridi in acumine longiori producto.—It is apparently a distinct species.

Hab.—Mixed with *Pottia Heimii*.—High mountains. *Downie*. It is also in the collections of 1873, by Dr. Hayden's assistants.

BRYUM INTERMEDIUM, Web. & Mohr.

Hab.—Fissures of humected rocks; not rare.

BRYUM CIRRHATUM, Hoppe & Hornsch.

Hab.—Grassy slopes and fissures of rocks, Twin Lakes. *Downie*.

BRYUM BIDUM, Schreb.

Hab.—Wet meadows; common.

BRYUM MUHLENBECKII, Bryol. Eur.

Hab.—Rocky Mountains; from specimens in Sullivant's herbarium com-

municated by General Palmer. This species is often confounded with *Bryum alpinum* from its close likeness to it.

BRYUM CÆSPITICUM, Linn.

Hab.—Dry ground; common everywhere.

BRYUM ARGENTEUM, Linn.

Hab.—Same localities as the former; rare in the Rocky Mountains.

BRYUM PSEUDO-TRIQUETRUM, Hedw.

Hab.—Springs on rocks. *Downie*.

BRYUM ROSEUM, Dill.

Hab.—Shade of pine woods in cañons. Explor. of 1873.

ZIERIA DEMISSA, (Hornsch.) Schp.

Hab.—Fissures of rocks; high mountains near Twin Lakes; rare. *Downie*.

MNIUM CUSPIDATUM, Hedw.

Hab.—Shaded wet places; low mountains. *Hall*.

MNIUM SERRATUM, Schrad.

Hab.—Sandy ground, springs and borders of streams; not rare.

MNIUM SPINOSUM, Voit.

Hab.—Mountains of middle altitude, under pines. *Downie*.

MNIUM SPINULOSUM, Bryol. Eur.

Hab.—Same places as the former; in open pine woods. *Hall*.

MNIUM PUNCTATUM, Linn.

Hab.—Springs in low mountains; sterile. *Hall*.

AMBLYODON DEALBATUS, Pal. Beauv.

Hab.—Boggy ground; plain and mountains. Twin Lakes. *Downie*.

MEERSIA ULIGINOSA, Hedw.

Hab.—Moist earth; fissures of rocks. *Hall*.

AULACOMNIUM PALUSTRE, Schwægr.

Hab.—Boggy places, plains and mountains; common.

BARTRAMIA ITHYPHYLLA, Brid.

Hab.—Fissures of shaded rocks, middle altitude; not rare.

BARTRAMIA PONTANA, Brid.

Hab.—Everywhere along streams and on wet rocks, with its numerous varieties, *gracilis*, *alpina*, *falcata*, &c.

TIMMIA MEGAPOLITANA, Hedw.

Hab.—Shaded banks and wet fissures of rocks; not rare.

TIMMIA AUSTRIACA, Hedw.

Hab.—Same positions, at greater altitude; rare. *Hall*; *Downie*.

POGONATUM URNIGERUM, (?) Linn.

Specimens too young and incomplete. May represent *P. capillare*, Brid., which is closely allied to *P. urnigerum*. Indeed, both species are considered by many as the same.

Hab.—Twin Lakes. *Downie*.

POGONATUM ALPINUM, Roehl.

Hab.—Wet rocks, waterfalls, &c., middle stations.

It is mostly represented in the Rocky Mountains in its var. *β. brevifolium*, Schp.

POLYTRICHADELPHUS LYALLII, Mitten.

Hab.—Pine-woods, middle region. *Hall*.

POLYTRICHUM GRACILE, Menzies.

Hab.—Swampy ground in the mountains. *Hall*.

POLYTRICHUM PILIFERUM, Schreb.

Hab.—Upon earth covering sand-rocks; common.

POLYTRICHUM PILIFERUM, var. LÆVIPILUM.

Polytrichum levipitum, Hampe.

Hab.—The same localities as the normal form, ascending, however, to a higher altitude. *Hall*.

POLYTRICHUM JUNIPERINUM, Hedw.

Hab.—Slopes in the mountains, on moist ground.

It is common, mostly represented by its alpine form, var. *S. alpinum*, Schp.

FONTALIS ANTIPYRETICA, Linn., var.

F. Neo-Mexicana, Sulliv. & Lesqx.

Hab.—Creeks and rivulets, attached to rocks. *Hall*.

DICHELYMA CAPILLACEUM, Bryol. Eur.

Hab.—Swift-running streams; rare. *Hall*; (and Explor. of 1873).

THUIDIUM BLANDOWII, Web. & Mohr.

Hab.—Pine-woods near Twin Lakes. *Downie*.

THUIDIUM ABIETINUM, Bryol. Eur.

Hab.—Glen Eyrrie, along with *Hypnum rugosum*, Ehrh. *Porter*.

HYPNUM (ELOIDIUM) PALUDOSUM, Sulliv.

Hab.—Swamps in the Parks. *Hall*.

CLIMACIUM DENDROIDES? Web.

Hab.—Boggy places in the mountains, sterile. It has been collected by both Hall and Downie in the same undeterminable state of growth. The leaves are shorter and more closely imbricated than in *C. Americanum*, Brid.

PYLAISÆA INTRICATA, (Hedw.) Schp.

Hab.—On trees, base of the mountains. The specimens are without fruit, and the species somewhat uncertain.

HYPNUM (BRACHYTHECIUM) LÆTUM, Brid.

Hab.—On the ground, shaded, grassy banks. *Downie*.

HYPNUM (BRACHYTHECIUM) ALBICANS, Neck.

Hab.—On rocks, Uinta Mountains. *Watson's Catalogue*.

HYPNUM (BRACHYTHECIUM) COLLINUM, Schp.

A variety merely differing from the European form by its conical operculum. As the specimens have a single ripe capsule, it cannot be ascertained if this character is merely casual.

Hab.—Grassy banks in the mountains. *Hall*; *Downie*.

HYPNUM (BRACHYTHECIUM) CAMPESTRE, Breh. & Schp.

Hab.—Borders of Sand Lake; sterile. (Explor. of 1873.)

HYPNUM (EURYNCHIUM) STRIGOSUM, Hoffm.

A diminutive form, closely resembling *H. diversifolium*.

Hab.—Roots of pines; hills and low mountains. *Hall*.

HYPNUM (EURYNCHIUM) DIVERSIFOLIUM, Bryol. Eur.

Hab.—Bark of dead pines in the Uintas. *Watson's Catalogue*.

HYPNUM (PLAGIOTHECIUM) NITIDULUM, Wahl.

The form is exactly corresponding with the European specimens and differs from the North American eastern specimens; referable to a different species.

Hab.—Moist shaded banks, pine region. *Downie*.

HYPNUM (PLAGIOTHECIUM) LÆTUM, Schpr.

Hab.—Same stations as the former. *Hall*.

HYPNUM (LIMNOBIUM) EUGYRIUM, Schpr.

Hab.—On stones, in mountain streams. *Hall*.

HYPNUM (AMBLYSTEGIUM) SUBTILE? Hoffm.

It is apparently the species. The capsule is too old for positive determination.

Hab.—Upon stones, in dry creeks. *Hall*.

HYPNUM (AMBLYSTEGIUM) SERPENS, Linn.

Hab.—Wet ground, near springs and shaded banks. *Hall*.

HYPNUM (AMBLYSTEGIUM) RADICALE, Brid.

Hab.—Decayed wood, in cañons. *Hall*.

HYPNUM (AMBLYSTEGIUM) ORTHOCLADON, Beauv.

Hab.—On stones, borders of shaded springs. *Hall*.

HYPNUM (CAMPYLUM) HISPIDULUM, Brid.

Hab.—Roots of trees, low mountains. *Hall*.

HYPNUM ADUNCUM, Hedw. var. *γ. polycarpum*, Schpr.

Hab.—Twin Lakes. *Downie*.

HYPNUM FLUITANS, Dill.

Hab.—Same as the former; sterile. *Downie*.

HYPNUM UNCINATUM, Hedw.

Hab.—Decayed wood, moist ground, &c.; common.

HYPNUM FILICINUM, Linn.

Hab.—Rocks humected by springs. *Hall*.

HYPNUM (RHITIDIUM) RUGOSUM, Ehrh.

Hab.—Dry ground, mountains of middle altitude; common.

HYPNUM (DREPANIUM) REPTILE, Michx.

Hab.—Root of trees in pine woods, same altitude. *Hall*.

HYPNUM (DREPANIUM) PALLESCENS, Schpr.

Hab.—On the bark of dead pines, Uinta Mountains. *Watson's Catalogue*.

HYPNUM (DREPANIUM) CUPRESSIFORME, Hedw.

Hab.—On trunks of dead pines; not rare.

HYPNUM (DREPANIUM) IMPONENS, Hedw.

Hab.—On decayed wood, base of the mountains. *Hall*.

HYPNUM (CTENIDIUM) MOLLUSCUM, Hedw.

Hab.—Humected perpendicular rocks, in cañons. *Hall*.

HYPNUM GIGANTEUM, Schpr.

Hab.—Hot Springs, National Park. (Explor. of 1872.)

HYPNUM NITENS, Schreb.

Hab.—Low grounds, in boggy places. *Hall*; *Downie*.

LICHENES.

By HENRY WILLEY, Esq.

DACTYLINA MADREPIFORMIS, Wulf.—Horse Shoe Mountain, at 11,000 feet altitude, July 18. (1.)

CETRARIA ISLANDICA, Ach.—An infertile fragment. (2.)

USNEA TRICHODEA, Ach. (3.)

THELOSCHISTES PARIETINUS, (L.) (4.)

PARMELIA KAMTSCHADALIS, Eschw., var. AMERICANA, Nyl.—Horse Shoe Mountain, at 11,000 feet altitude.—Infertile. (5.)

- PARMELIA CAPERATA, Ach.—Infertile. (6.)
 PARMELIA CONSPERSA, Ach. (7.)
 PARMELIA OLIVACEA, Ach., var. EXASPERATA, Dw. (8.)
 PARMELIA LANATA, Nyl.—Mount La Plata, at 14,200 feet altitude, August 3. Infertile. (9.)
 UMBILICARIA CYLINDRICA, Ach. (10.)
 UMBILICARIA RUGIFERA, Nyl. (11.)
 PELTIGERA APHTHOSA, Hoffm. (12.)
 PELTIGERA CANINA, Hoffm. (13.)
 SOLORINA BISPORA, Nyl. *Syn. p.* 331. White-House Mountain, at 13,800 feet altitude, August.—Perhaps, as Nyl. observes, only a variety of *S. saccata*, from which it differs in its more urceolate apothecia and thekes containing only two spores, which in the specimens before me measure .054 to .110 mm. long and .027 to .040 mm. wide. New to this continent. (14.)
 COLLEMA PULPOSUM, Ach.—Infertile. (15.)
 PLACODIUM CORALLOIDES, Tuck.—A small, infertile fragment. (16.)
 PLACODIUM ELEGANS, DC. (17.)
 PLACODIUM CALLOPISMUM, Ach. (18.)
 PLACODIUM VITELLINUM, (Ehrh.,) Ach. (19.)
 PLACODIUM CERINUM, Ach., var., STILLICIDIORIUM, Ach.—On mosses. (20.)
 PLACODIUM BOLACINUM, Tuck. ? White House Mountain, at an elevation of 13,000 feet, August. (21.)
 LECANORA STRAMINEA, Wahl.—A small, infertile fragment. (22.)
 LECANORA MURALIS, (Schreb.,) Schar. (23.)
 LECANORA RUBINA, Ach. (24.)
 LECANORA ——— ? A very small and imperfect specimen, belonging to the section *Squamaria* and distinguished chiefly by its large spores, which are from 4 to 8 in the thekes, and measure from .019 to .027 mm. long by .007–.008 mm. wide. I cannot refer it to any described species. (25.)
 LECANORA SUBFUSCA, Ach. (26.)
 LECANORA VARIA, Fr. (27.)
 LECANORA BRUNONIS, Tuck. ?—White House Mountain, at 13,000 feet altitude, August.—The very small fragment seems to belong here, but the spores are at length 4-locular, .015 to .018 mm. long by .004 to .005 wide. (28.)
 LECANORA CINEREA, (L.) (29.)
 LECANORA CALCAREA, (L.,) Somf.—White House Mountain at 13,000 feet altitude, August.—The specimens are elegantly effigurate. This form has before occurred, I believe, on this continent only in Greenland. (30.)
 LECANORA CHLOROPHANA, (Wahl.,) Ach.—The specimens mostly dealbate. (31.)
 LECANORA XANTHOPHANA, Nyl. (32.)
 LECANORA CERVINA, (Pers.,) Somf. (33.)
 RINODINA OREINA, (Ach.,) Mass. (34.)
 RINODINA SOPHODES, (Ach.,) Mass. (35.)
 STEREOCAULON PASCHALE, Laur. ? Infertile. (36.)

STEREOCAULON CONDENSATUM, Laar.? Infertile. (37.)

CLADONIA PYXIDATA, Fr. (38.)

CLADONIA PUBCATA, Flk., var. RACEMOSA, ib. (39.)

CLADONIA VERMICULARIS, Ach.—Head-waters of Platte River, at 10,000 feet altitude.—Spermatogones and spermatia similar to those described by Nylander, have occurred to me in White House Mountain specimens of this plant. (40.)

LECIDEA CONTIGUA, Fr.—White House Mountain, at 13,000 feet altitude, August. (41.)

LECIDEA CONTIGUA, Fr.?, with smaller apothecia.—Mount La Plata, at 14,000 feet altitude. (41a.)

LECIDEA CONFLUENS, Schær.—White House Mountain, at 13,000 feet altitude. (42.)

LECIDEA ENTEROLEUCA, Fr.—On twigs; the thallus lutescent. (43.)

LECIDEA ATRO-BRUNNEA, (D.C.) Schær.—Mount La Plata, at 14,000 feet altitude. (44.)

LECIDEA LUGUBRIS, (Somf.,) Nyl.—White House Mountain, at 13,000 feet altitude. (45.)

LECIDEA LAPICIDEA, Ach.—A single small specimen. (46.)

BUELLIA ALBO-ATRA, (Hoffm.,) Nyl.—White House Mountain, at 13,000 feet altitude. (47.)

BUELLIA GEOGRAPHICA, (L.,) Th. Fr. (48.)

STAUROTHELE UMBRINA, (Wahl.,) Tuck.—A few traces of this lichen occurred on fragments of rocks with other lichens. (49.)

VERRUCARIA PYRENOPHORA, Nyl.?—A single small specimen. Spores 2-locular, .027-.32 mm. long by .012-.14 wide.—White House Mountain, at 13,000 feet altitude. (50.)

VERRUCARIA —? Thallus hardly any. Apothecia sessile, globose, with a depressed article; perithecia black, entire; paraphyses indistinct. Reaction with iodine various, red. Spores 2-val., 4-pluri-locular, irregularly muriform, colorless or slightly fuscous, .027-.36 mm. long by .015-.18 wide. The very small quantity of this which occurred is hardly sufficient for its determination. It is perhaps new. (51.)

VERRUCARIA —? Parasitic on a sterile thallus, which is perhaps that of *Buellia epigra*. Apothecia minute, emergent; paraphyses distinct capillary, not colored by iodine. Spores 4-several, acutely ellipsoid, constricted in the middle, 4-locular, submuriform, colored, .029-.38 mm. long by .008-.12 mm. wide. (52.)

ENDOCOCCUS ERRATICUS, (Mass.,) Nyl. Parasitic on *Placodium elegans*. The internal characteristics appear to agree with this species. Paraphyses deficient. Reaction with iodine various, red. Thekes ventricose, polysporous. Spores 2-locular, colored, .008-.11 mm. long, by .004-.5 mm. wide. New to this continent. (53.)

FUNGI.

BY CHARLES H. PECK, Esq.

AGARICUS LACCATUS, Scop. Pileus thin, convex, sometimes expanded; even or slightly umbilicate, smooth, or minutely scaly, hygrophanous when moist dull reddish-yellow, or reddish flesh-colored, sometimes striatulate on the margin, when dry pallid or pale dull ochraceous; lamellæ broad, rather thick and distant, not decurrent, flesh-colored; stem

Ag. Laccatus Peck — *Ag. Laccatus* Peck
Canadensis

slender, firm, fibrous, stuffed, equal, concolorous. Plant very variable, 1-6 inches high; pileus .5-2 inches broad.—Twin-Lake Creek, August.

AGARICUS VELUTIPES, Curt. Cæsпитose; pileus fleshy, thin on the margin, convex, smooth, very viscid, dull yellow with a brownish disk or bright reddish-yellow; lamellæ close, rounded behind, slightly attached, yellowish; stem equal or slightly tapering upward, hollow or stuffed, generally velvety and brown, sometimes pale yellow and primrose. Plant 1-2 inches high; pileus 5-1.5 broad.—Twin-Lake Creek, August.

AGARICUS ILLICITUS, Peck. Pileus fleshy, firm, broadly convex or expanded, smooth, hygrophanous, very dark brown when moist, paler when dry; lamellæ close, broad, tapering outwardly, plane or ventricose, rounded behind, with a very slight decurrent tooth, pale dingy brown; stem firm, equal, hollow, scabrous, distinctly striate at the top, paler than the pileus. Plant 1.5-2 inches high; pileus 1-1.5 inches broad.—Twin-Lake Creek, August.

**AGARICUS*.——? Twin-Lake Creek, August.

**LACTARIUS*.——? Twin-Lake Creek, August.

LENZITES SEPIARIA, Fr. Pileus coriaceous, tough, dimidiate, often elongated, zoned, strigose-tomentose, brown, generally paler or yellowish on the margin; lamellæ rather thick, slightly branched or anastomosing, yellowish, inclining to brown.

Var. β . *POROSA*.—Lamellæ abundantly anastomosing and forming pores.—Mount of the Holy Cross and Twin-Lake Creek, August.

DACRYMYCES STILLATUS, Nees. Subrotund, convex, often plicate, yellow or orange, color persistent; spores multiseptate.—White House Mountain, August.

PUCCINIA PORTERI, Peck. (*n. sp.*) Spots none; sori amphigenous, crowded or scattered, rotund, rather small, prominent, brown; spores oblong or obovate-oblong, constricted in the middle, about .0016 inch long, .0007-.0009 inch broad; peduncles hyaline, one-half to twice the length of the spore. On leaves of *Veronica alpina*. Twin Lakes, July. The sori, which are about .018 inch in diameter, occupy the whole under surface of the leaf, being so closely placed as to appear almost confluent. In some instances they appear suffused by a cinereous hue, due, perhaps, to the germination of the spores. The sori on the upper surface of the leaves are scattered and comparatively few. The species seems to be related to *P. brunnea*, Billings, from which it may be separated by its amphigenous habit and hyaline peduncles. Dedicated by its discoverer, John M. Coulter, to Prof. T. C. Porter.

PEZIZA VULCANALIS, Peck. *Hayden's 6th Ann. Rep.*, 1872. Cup fleshy, funnel-form, stipitate, crenate on the margin, smooth when fresh, rugulose and more or less brown when dry; hymenium pale orange; stem slender, solid, smooth, brown; asci cylindrical; paraphyses slightly thickened at the tips; spores elliptical, smooth, 0.0004-0.0006 inch long, 0.0003 inch broad. Plant, 6-10 lines high; cup 4-6 lines broad.—Ground. Twin-Lake Creek, August.

PEZIZA SCUTELLATA, L. Cups scattered or gregarious, sessile, shallow or plane, vermilion, externally paler and hispid, with straight brown or black hairs; asci cylindrical; paraphyses clavate at the tips; spores elliptical, .0008 inch long. Plant usually about one-fourth of an inch in diameter, the hymenium fading in drying.—Twin-Lake Creek, August.

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