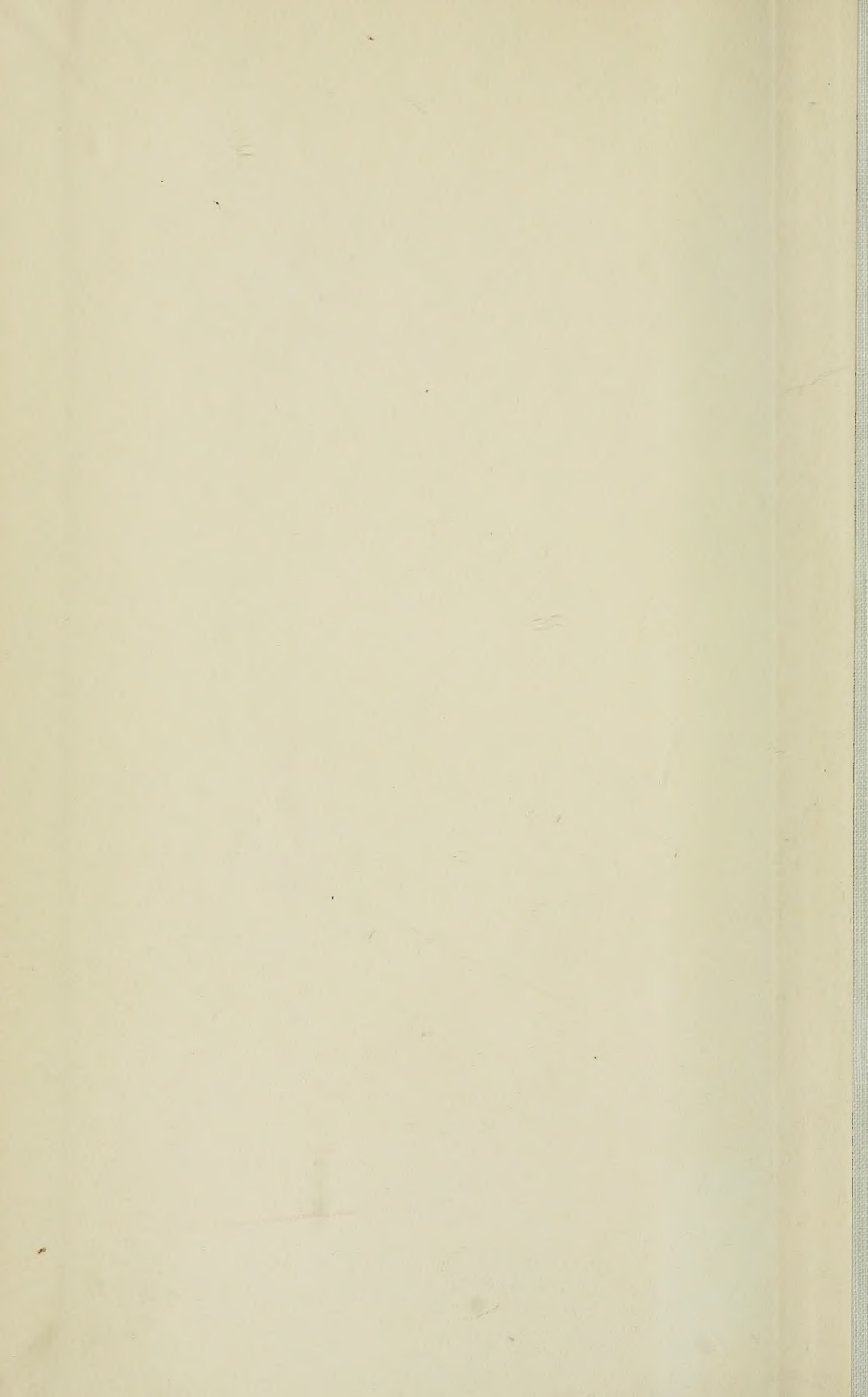


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Volume 2

No. 1

MUHLENBERGIA

A. A. HELLER, Editor

LOS GATOS, CALIFORNIA, OCTOBER 25, 1905

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[All unsigned articles in this journal are by the Editor, and the types of all new species described by him are deposited in his private herbarium, unless otherwise stated.]

BOTANICAL EXPLORATION IN CALIFORNIA

SEASON OF 1905

The writer had hoped to publish an account of each season's collections from this State, beginning with the first one in 1902, but up to this time it has not been possible to do so.

The collection of this season is one of interest for various reasons. There are a large number of novelties; the known range of a number of species has been extended; and an opportunity is afforded for comparison of the floras of the opposite ends of the great interior valley, points about 550 miles apart.

A summary of the work will be given at the end of this paper, as the whole collection will not have been determined until after this first part of the report is printed.

My thanks are due to the California Academy of Sciences, and Miss Eastwood, Curator of the herbarium, for facilities for carrying on the field work, as well as free use of the herbarium and library. The types of all new species described by me from this collection are deposited in the herbarium of the Academy.

NOV 2 - 1905

CATALOGUE OF SPECIES

POLYPODIACEAE

✓ POLYSTICHUM MUNITUM IMBRICANS (D. C. Eaton) Maxon, Fern Bulletin, 8: 30. 1900.

Aspidium munitum var. *imbricans* D. C. Eaton, Ferns N. A. 1: 188. *pl.* 25. *f.* 3. 1878.

No. 8061, collected June 17, on bare rocks with a southerly exposure, overlooking a deep gorge near the source of the Sacramento river west of Sisson, Siskiyou county. The original specimen was collected by Kellogg in Mendocino county.

It is to be hoped that observations may be made so as to determine whether this fern ever occurs in comparatively moist situations or on northerly slopes. The writer collected it once before, under no. 5932, in Lake county, growing in dry gravelly ground on southerly slopes, but the plants were larger, being shaded more or less by a scattered growth of trees.

PELLAEA ORNITHOPUS Hook. Sp. Fil. 2: 143. *pl.* 116 A. 1858.

No. 7816, collected May 1, near Keene Station, in the Tehachapi mountains, growing about stones and rocks on a grassy, sparsely wooded slope. The species seems to be pretty well distributed over the State, occurring at medium elevations. The type was collected in California.

MARSILEACEAE

MARSILEA VESTITA Hook. & Grev. Ic. Fil. 2: *pl.* 159. 1831.

No. 7919, collected May 31, in damp sand along the Sacramento river, about two miles above Redding, Shasta county. It was plentiful and of thick growth, the slender rootstocks often two or three feet long, lightly covered by the wet sand.

SELAGINELLACEAE

SELAGINELLA BIGELOVII Underw. Bull. Torr. Club, 25: 130. 1898.

No. 7610, collected April 7, on rocks at the first railroad

crossing of the creek west of Caliente, Kern county. It is very abundant all through that part of the country, literally covering the rocks in many places, notably on the ridges about the mouth of Kern canyon. This species is perhaps more abundant in the southern part of the State, where it was originally collected by Bigelow, but is also plentiful east of San Jose, Santa Clara county, on the ridges above Alum Rock Park. It is easily distinguished from the other species by its slender, rather long branches.

SELAGINELLA HANSENI Hieron. *Hedwigia*, **39**: 301. 1900.

No. 7583, collected March 22, on a low ridge directly east of South Butte, Marysville Buttes, Sutter county, where it is plentiful, almost covering the rocks and stones in many places. This is also a well marked species, the fronds being short and broad. The type is Hansen's 878, collected near Fisher's Cabin on the Mokelumne river, in either Amador or Calaveras county, April, 1893. Specimens are also cited from the Oakland Hills, collected by Hillebrand, and from Fresno county by A. A. Eaton.

GNETACEAE

EPHEDRA NEVADENSIS S. Wats. *Proc. Am. Acad.* **14**: 298.
1879.

No. 7703, collected some miles east of Mojave at Randsburg, Kern county, April 14, elevation 3300 feet, where it is rather plentiful on the desert hills. These specimens were in flower only. The type should probably be some specimen of Watson's no. 1108 of Bot. King Exped. 329, but the first definitely recorded specimen is "(Fort Mohave, Cooper)."

No. 7743 was obtained in fruit in a gulley at Oil City, opposite Bakersfield, Kern county, April 22, elevation about 500 feet. It was less abundant here than in the desert.

POACEAE

The determinations by Mr. Theodor Holm

PANICUM OCCIDENTALE Scribn. Rep. Mo. Bot. Gard. **10**: 48.
1899.

No. 7856, collected May 26, in moist ground along a small stream about two miles west of Redding, Shasta county, where it was found sparingly.

STIPA LEMMONI JONESH Scribn. U. S. Dep. Ag. Div. Agrost.
Circ. 30: 4. 1901.

No. 7934, collected June 1, along the Sacramento river near Shasta Retreat, Siskiyou county, growing in rather dry clayey soil. The type was collected by Jones at Emigrant Gap, Placer county, June 28, 1882.

STIPA OCCIDENTALIS Thurber, in S. Wats. Bot. King Rep. 380.
1871.

No. 7936, collected June 1, along the Sacramento river near Shasta Retreat, Siskiyou county, growing in rather dry clayey soil. The type is Bolander's 5038 from "Yosemite Trail, California."

MUHLENBERGIA DEBILIS Trin. Gram. Unif. 193. 1824.

No. 7654, collected April 12, on the ridge at the mouth of Kern canyon, Kern county. It was not plentiful, only a few plants here and there near granite rocks.

POLYPOGON LITTORALIS (With.) Smith, Comp. Fl. Brit. Ed. 2,
13. 1816.

Agrostis littoralis With. Bot. Arr. Br. Pl. Ed. 3, **2**: pl. 23.
1796.

No. 7915a, collected May 31, in wet places along a little stream in the hills near Keswick, Shasta county.

DESCHAMPSIA CALYCINA Presl, Rel. Haenk. **1**: 251. 1830.

No. 7855, collected May 26, in wet ground along a little stream about two miles west of Redding, Shasta county, where it was plentiful.

MELICA CALIFORNICA Scribu. Proc. Acad. Phila. **1885**: 46.
1886.

No. 7857, collected May 26, on hills about two miles west of Redding, Shasta county, growing in dry ground near rocks. This is the species called *M. bulbosa* in the Botany of California.

MELICA IMPERFECTA Trin. Gram. Suppl. Bull. Acad. St. Petersburg. **1**: 68. 1836.

No. 7652, collected April 12, on the rocky ridge on the north side of the mouth of Kern canyon, Kern county, where it is plentiful, growing in large tufts on the steep slope.

DISTICHLIS SPICATA (L.) Greene, Bull. Cal. Acad. **2**: 415. 1887.

Uniola spicata L. Sp. Pl. 71. 1753.

Distichlis maritima Raf. Journ. Phys. **89**: 104. 1819.

No. 7593, collected April 6, on the embankment of the Santa Fe railroad about one mile west of Bakersfield, Kern county.

BRIZA MAXIMA L. Sp. Pl. 70. 1753.

No. 8075, collected June 20, at Gazelle, in the Shasta Valley, Siskiyou county. It was abundant, growing in tufts along the railroad.

ACHYRODES AUREUM (L.) Kuntze, Rev. Gen. Pl. 758. 1891.

Cynosurus aureus L. Sp. Pl. 73. 1753.

Lamarckia aurea Moench, Meth. 201. 1794, not *Lamarckia* Medic. 1789, nor Olivi, 1792.

No. 7653, collected April 12, on the rocky ridge on the north side of the mouth of Kern canyon, where only a few small plants were found growing under the shelter of a rock. Later it was seen under similar conditions along the road about one mile within the canyon.

POA GRACILLIMA Vasey, Cont. U. S. Nat. Herb. **1**: 272. 1893.

No. 7584, collected April 4, on the dry slopes of China Grade opposite Oil City near Bakersfield, Kern county. It was

plentiful at this place, but there were only a few plants in each tuft. The type was collected on Mt. Adams, Washington, by W. N. Suksdorf.

No. 8007, collected June 9, on dry volcanic hillsides about a mile east of Montague, Siskiyou county, where it was also abundant.

POA HOWELLII Vasey & Scribn. Ill. N. A. Grasses, **2**: pl. 78.
1893.

No. 7342, collected April 21, 1904, near the summit of the first ridge west of Los Gatos, Santa Clara county, where it was found sparingly along a little used road. The range originally given is "California to Oregon in woods and swamps."

POA LAEVIGATA Scribn. U. S. Dept. Ag. Div. Agrost. Bull. 5:
31. 1897.

Poa laevis Vasey, Cont. U. S. Nat. Herb. **1**: 273. 1893, not R. Br.

No. 8038, collected June 15, on the first ridge west of Sisson, Siskiyou county, growing in dry and rather open places, the plants scattered and occurring as individuals only.

No. 8070, collected June 19, along the railroad near Grenada Station, Siskiyou county. It is rather plentiful here, growing in large tufts on the open plain in more or less alkaline soil.

FESTUCA ELMERI Scribn. & Merrill, Bull. Torr. Club, **29**: 468.
1902.

No. 7471, collected May 3, 1904, at medium elevations on the first ridge west of Los Gatos, Santa Clara county, in rather rich soil near trees and shrubs.

FESTUCA PACIFICA Piper

No. 8039, collected June 15, at medium elevations among conifers on the first ridge west of Sisson, Siskiyou county.

BROMUS ORCUTTIANUS Vasey, Bot. Gaz. **10**: 223. 1885.

No. 8026, collected June 13, in loose dry ground along the

railroad just above Shasta Springs, Siskiyou county. C. R. Orcutt obtained the type in the mountains near San Diego.

BROMUS PORTERI (Coult.) Nash, Bull. Torr. Club, **22**: 512. 1895.

Bromus Kalmii var. *Porteri* Coult. Man. Rocky. Mt. 425. 1885.

No. 7944, collected June 1, near Shasta Retreat, Siskiyou county, in dry, somewhat clayey soil along the railroad. Mr. Holm determined this as "*Bromus Porteri* var." The type of the species was collected at Twin Lakes, Colorado, by Dr. T. C. Porter.

BROMUS PUMPELLIANUS Scribn. Bull. Torr. Club, **15**: 9. 1888.

No. 7880, collected May 27, in a copse along the railroad about a mile above Redding, Shasta county. Although not reported from California, this species is rather widely distributed in the State. Scribner obtained the type in the Belt Mountains, Montana.

BROMUS PUMPELLIANUS MELICOIDES Shear, U. S. Dep. Agric. Div. Agrost. Bull. 23: 50. 1900.

No. 7935, collected June 1, along the Sacramento river near Shasta Retreat, Siskiyou county, in clayey soil, elevation about 2400 feet. Not hitherto recorded from California. L. H. Pammel obtained the type at Beaver Creek Camp, Colorado, at an elevation of over 10000 feet.

BROMUS TECTORUM L. Sp. Pl. 77. 1753.

No. 8012, collected June 9, at Montague, Siskiyou county, where it is abundant along the railroad and in pasture land, being considered an undesirable weed when mature. It seems to be widely distributed in the Shasta Valley, although of recent introduction.

ELYMUS GLAUCUS Buckley, Proc. Acad. Phila. **1862**: 99. 1863.

No. 7886, collected May 29, in sand along the Sacramento river at the bridge near Redding, Shasta county.

ELYMUS CONDENSATUS Presl, Rel. Haenk. 1: 265. 1830.

No. 8069, collected June 19, near Grenada Station, Siskiyou county. The plants here were considerably less robust than the typical form from Monterey, which attains a height of 8 or 10 feet, with very large spikes and broad leaves.

SITANION CALIFORNICUM J. G. Smith, U. S. Dep. Agric. Div. Agrost. Bull. 18: 13. 1899.

No. 8071, collected June 19, near Grenada Station, Siskiyou county, where it is rather plentiful along the railroad, growing in small tufts. The type was collected in the San Bernardino mountains by S. B. Parish, no. 3295.

CYPERACEAE

The determinations by Mr. Theodor Holm

SCIRPUS RIPARIUS Spreng.

No. 7854, collected May 26, about two miles west of Redding, Shasta county, growing in shallow pools which become dry later in the season. I can find no reference to this name in any of the literature at hand.

CAREX AMPLIFOLIA Boott, in Hook. Fl. Bor. Am 2: 228. *pl.* 226. 1839.

No. 7974, collected June 5, on a wet bank along the railroad a short distance above Shasta Retreat, Siskiyou county. This number represents a small form of the species.

No. 7982, collected June 5, a short distance below Shasta Springs, Siskiyou county, is the large typical form. The plants were growing on the edge of a small stream near a soda spring.

CAREX AUREA Nutt. Gen. 2: 205. 1818.

No. 8096, collected June 22, in a wet meadow near Igerna, Siskiyou county. The type is from the "shores of Lake Michigan."

CAREX BOLANDERI Olney, Proc. Am. Acad. 7: 393. 1868.

No. 8025, collected June 13, along the railroad just above Shasta Springs, Siskiyou county, on a dripping bank, the plants numerous in thick tufts.

CAREX LANUGINOSA Mich. Fl. Bor. Am. 2: 175. 1803.

No. 8095, collected June 22, near Igerna, Siskiyou county, where it was plentiful in a wet meadow among grass.

CAREX MARCIDA Boott, in Hook. Fl. Bor. Am. 2: 212. *pl.* 213. 1839.

No. 8072, collected June 20, at Gazelle, Siskiyou county. This slender form was abundant in a swampy field a short distance north of the railroad station.

CAREX NUDATA W. Boott, Bot. Cal. 2: 241. 1880.

No. 7921, collected June 1, at the water's edge on the Sacramento opposite Upper Soda Spring, Siskiyou county. Mr. Holm says it is "very rare." The type was collected by Bolander, the range given "in the Coast Ranges from San Francisco Bay to Ukiah." It looks remarkably like the plant figured as *C. Wilkesii* under plate 17 of the atlas to volume 17 of the U. S. Exploring Expedition. On page 477 of that work it is referred to *C. laciniata* Boott, but is not described, unless the explanation of the plate is taken as a description. It was collected on the "banks of the Sacramento."

CAREX STERILIS Willd. Sp. Pl. 4: 208. 1805.

No. 8041, collected June 15, in a little meadow at the foot of the first ridge west of Sisson, Siskiyou county. In the Botany of California it is recorded only from "swamps near Mendocino City."

LEMNACEAE

LEMNA MINOR L. Sp. Pl. 970. 1753.

No. 7561, collected March 21, at Marysville, Sutter county, where it covered a small pond near the railroad.

JUNCACEAE

The determinations by Mr. Theodor Holm

JUNCUS OXYMERIS Engelm. Trans. St. Louis Acad. **2**: 483.
1868.

No. 7520, collected on the summit of the first ridge west of Los Gatos, Santa Clara county, in wet clay about a spring. The original was collected by Hartweg in swampy places in the Sacramento valley somewhere north of Marysville.

JUNCUS TENUIS Willd. Sp. Pl. **2**: 212. 1799.

No. 7466, collected May 31, 1904, in a wet place near the reservoir west of Los Gatos, Santa Clara county, where it is not common.

MELANTHACEAE

ZYGADENUS VENENOSUS S. Wats. Proc. Am. Acad. **14**: 279.
1879.

No. 7823, collected in wet ground at Tehachapi, Kern county, May 5. The type of the species came from the Coast Range in Monterey county, and apparently is confined to wet places.

ODONTOSTOMUM HARTWEGII Torr. Pac. R. R. Rep. **4**: 150. *pl.*
24. 1857.

No. 7846, collected May 25, at Redding, Shasta county, on dry gravelly hills in the western part of the town, where it is locally abundant. This is probably its northern limit, as heretofore it has not been recorded from north of Butte county. The type was collected by Hartweg "in locis siccis glareosis, in valle Sacramento," undoubtedly in Butte county. It has been reported from as far south as the foothills of Amador county, and is said to be rare.

LILIACEAE

ALLIUM ATTENUIFOLIUM Kellogg, Proc. Cal. Acad. **2**: 110. *pl.*
34. 1861.

No. 7901, collected about two miles northeast of Redding, Shasta county, May 30, in moist gravel along a stream. It is rather common in that region, growing either in gravel or sand along streams. Our specimens are from near type locality, for "it was brought from Shasta by Mr. Andrew A. Veatch, and cultivated by M. H. G. Bloomer." Shasta is eight or ten miles west of Redding.

ALLIUM HYALINUM Curran; S. Wats. Proc. Am. Acad. **24**: 87.
1888.

No. 7805, collected May 1, in rich loose ground about rocks in shaded places on the first ridge west of Keene station, in the Tehachapi mountains, Kern county. It grew in matted clumps, a dozen or more bulbs often massed together. The flowers are white. Originally collected at Salmon Falls, Eldorado county, by Mrs. Curran, June, 1881.

ALLIUM PARRYI S. Wats. Proc. Am. Acad. **14**: 231. 1879.

No. 7619, collected April 7, near Caliente, Kern county, in adobe soil in a field about a mile east of the town. The original is from "Coast Ranges (San Bernardino County, Dr. C. C. Parry, n. 390, 1876)." Our plant may possibly be distinct, as it does not agree in all particulars with the description of the type, being twice taller, and has stamens nearly or quite equalling the perianth segments, instead of one-third shorter. The segments appear to be almost blunt in flowers which have just opened, while in the older ones they are acute, as described.

ALLIUM SERRATUM S. Wats, Bot. King Exped. 487. *pl.* 37. *f.* 4.
5. 1871.

No. 7740, collected April 22, on dry hillsides back of Oil City, near Bakersfield, Kern county. Watson's type, taking the plant first cited, was collected somewhere in the coast region by Douglas. His figure of the flower is faulty, as it gives no indication of the perianth segments being in two series, nor is this fact mentioned in the description. The inner ones are less spreading at the base, and a little shorter than the outer ones.

If *A. amplexens* Torr. Pac. R. R. Rep. 4: 148 is really the same, that name has precedence and should be adopted, but according to description it is something different.

No. 7781, collected April 26, in Kern canyon, Kern county, about a mile above its mouth, on steep slopes with a northerly exposure. These plants were much larger than those of 7740, being in moister and more sheltered places. The flowers, as in the other number, are deep rose-purple and large, the segments 12 or 13 mm. in length.

HESPEROCORDUM LACTEUM Lindl. Bot. Reg. 19: pl. 1639.
1833.

Allium lacteum Benth. Pl. Hartw. 339. 1857.

Brodiaea lactea S. Wats. Proc. Am. Acad. 14: 238. 1879.

No. 7911, collected May 31, on hills about a mile west of Middle Creek station near Redding, Shasta county, growing in moist ground near a small stream. It is common in the Sacramento valley, usually in places which are wet during the winter and early spring. It was "found by Mr. Douglas in California, whence its roots were sent to the Horticultural Society in 1833."

HOOKERA CALIFORNICA (Lindl.) Greene, Bull. Cal. Acad. 2:
136. 1886.

Brodiaea Californica Lindl. Trans. Hort. Soc. 4: 84.

Brodiaea grandiflora var. (?) *major* S. Wats. Bot. Cal. 2:
153. 1880.

No. 7844, collected on dry gravelly hills in the western part of Redding, Shasta county, May 25, the plants averaging about two feet in height. The flower of this species is poorly described by recent authors. It is narrow, almost tubular, and certainly not "broadly funnel-form," as implied by Watson; 4 cm. long, the tube 1 cm. long, 5 mm. broad, slightly or not at all enlarged; the violet-purple segments 3 cm. long, oblong or oblong spatulate, about 7 mm. wide, three of them rounded at the apex, the other three acute, all marked with a prominent dark midvein. The stamens and staminodia extend about 2 cm.

beyond the tube, the anthers 1 cm. long; the staminodia usually a little longer than the stamens, 2 mm. wide, blunt or retuse, with prominent midvein, slightly arched inward and standing close to the stamens.

No. 8097, collected July 14, on dry hillsides near Grass Valley, Nevada county. Some of these plants were four or five feet high, growing among shrubs where they were sheltered.

HOOKERA CORONARIA Salisb. Parad. Lond. 2: *pl.* 98. 1808.

Brodiaea grandiflora Smith, Trans. Linn. Soc. 10: 2. *pl.* 1.
1811.

No. 8098, collected July 15, along the electric railroad between Grass Valley and Nevada City, Nevada county, growing occasionally in company with *H. californica*. It is not quite so tall as that species, and is distinguishable at some distance by its darker color, which is violet-blue, and by the wider, funnel-form flower with spreading lobes. The internal structure is also quite different. One point never brought out in descriptions made from herbarium specimens is that the staminodia are erect, standing entirely away from the stamens, and distant from them at least 5 mm.

HOOKERA TERRESTRIS (Kellogg) Britten, Journ. Bot. 24:

Brodiaea terrestris Kellogg, Proc. Cal. Acad. 2: 6. 1859.

No. 7637, collected April 7, on sandy plains near Oil City, opposite Bakersfield, Kern county. In general appearance this plant resembles *H. terrestris* more than *H. minor*, but it is possibly undescribed. The staminodia are about 1 mm. longer than the stamens, inserted against the outer perianth segments, thence leaning in toward the stamens, but not touching them, oblong, about 2 mm. wide, slightly 3-toothed at the truncate apex: filaments free for about 1 mm.; anthers pale yellow, oblong, 3 mm. long, shortly 2-toothed, the teeth slightly bending toward each other. The perianth is nearly 2 cm. long, either pale or deep violet, the segments spreading but hardly rotate. It is plentiful on the plains between Bakersfield and the foothills.

TRITELEIA LAXA Benth. Trans. Hort. Soc. II. **1**: 413. *pl.* 15. *f.*
2. 1835.

Brodiaea laxa S. Wats. Proc. Am. Acad. **14**: 237. 1879.

No. 7804, collected May 1, on the first ridge west of Keene station in the Tehachapi mountains, Kern county, growing in rich loose soil about rocks. This is the very large flowered form, the perianth, often being pinkish or pale, with prominent dark midvein.

The typical form, as shown by the colored plate, is the smaller but still ample flowered one with deep violet-blue flowers, found in the region of San Francisco Bay. My 7389, collected near Los Gatos, distributed in 1904, is typical.

CALLIPRORA SCABRA Greene, Erythea, **3**: 126. 1895.

No. 7623, collected April 7, about a mile east of Caliente, Kern county, in a field in adobe soil. This has larger as well as paler flowers than any other species in the genus, but become darker in drying. In our specimens the forks of the filaments seem to be somewhat recurved. The scabrous roughness is very pronounced. No definite station is given for the original, more than that it is "common in the middle Sierra Nevada of California."

Calliprora analina (Greene)

Calliprora scabra var.? *analina* Greene, Erythea, **3**: 126.

1895.

No. 7986, collected June 5, in dry ground in open places in the woods on the plateau just above Shasta Springs, Siskiyou county. Since the description of this plant is very short, it seems best to add to it somewhat.

Plant slender; 2 dm. high from a small (1 cm. in diameter) fibrous-coated corm: stems somewhat purplish, especially below, slightly scabrous: leaves one or two, linear, equalling or a little exceeding the stem, 4 mm. wide, faintly scabrous on the margins: umbel about 8-flowered or less, the slender pedicels 2 cm. long, the outer ones slightly upcurved near the apex: perianth

13 or 14 mm. long, bright yellow, the segments oblong or oblong lanceolate, 3 mm. wide, the outer blunt, the inner acutish, terminated by a short, slightly incurved mucro, a prolongation of the dark midvein: filaments alternately long and short, the appendages only 1 mm. long, slender and pointed; anthers blue.

DICHELOSTEMMA CAPITATUM (Benth.) Wood, Proc. Phila. Acad.

1868: 173. 1869.

Brodiaea capitata Benth. Pl. Hartw. 339. 1857.

No. 7688, collected April 14, on stony hillsides at Randsburg, Kern county, in the Mojave desert. These plants have fewer, smaller and paler flowers than the typical form from "sylvis prope Monterey," but so far no characters to warrant a separation have been noted in the dried specimens. It seems to be common on the desert hills, having also been observed near Mojave.

Dichelostemma multiflorum (Benth.)

Brodiaea multiflora Benth. Pl. Hartw. 339. 1857.

Hookera multiflora Britten, Journ. Bot. 24:

The type of this was collected by Hartweg in 1847 "in valle Sacramento," probably in the vicinity of Chico, Butte county. Bentham's description is short and unsatisfactory, but the staminodia are said to be "ovata, integerrima." Watson says "staminodia entire, broad and obtuse, about equalling the anthers." Greene says "staminodia obtuse, entire, little exceeding the oblong, deeply bifid anthers."

No. 7862 was collected May 26, on dry wooded hills about two miles west of Redding, Shasta county, at that time nearly past flowering, and from living plants of this the following description is drawn:

Flowers pale violet, in capitate clusters of 10 or more, the middle pedicels longest, often 15 mm., the others ranging from 5 to 10 mm.: perianth 2 cm. long, half of which is tube, 5 or 6 mm. across the tubid base, then narrowed to 3 or 4 mm.; segments either ascending or somewhat rotate when fully expanded,

oblong, a little narrowed at the apex, 4 or 5 mm. wide, marked by the dark midvein, which in the outer segments is prolonged into a slight cusp: staminodia colored like the segments or paler, the free portion 4 mm. long, 1 mm. longer than the stamens, the dorsal side rounded and slightly tumid at the base, the edges turned in and parallel so as to almost close over the stamens: stamens 3, the filaments adhering to the perianth tube throughout, only the oblong, pointed pale yellow anthers 3 mm. long free: style shorter than the anthers, extending only to the top of the perianth tube, about 1 mm. in diameter, gradually enlarged above, the slightly 3-lobed stigma barely 2 mm.

A specimen collected in full flower May 5, 1902, about 8 miles from Chico on the Oroville road, and probably from type locality is essentially the same, differing in having blunter anthers which equal the staminodia, and the pistil is almost as long as the stamens. This plant grew in rich soil in an open field, the flowers of a deep violet.

No. 7942, collected June 1, near Shasta Retreat, Siskiyou county, was in full flower, growing in loose rich soil in woods recently burned over. It differs from 7862 in having paler flowers on shorter pedicels, the staminodia with apices slightly curved back, extending 3 mm. beyond the anthers; the anthers 1 mm. long: pistil as long as the stamens, the style somewhat three-angled, the slightly enlarged stigmatic end 1 mm. across.

CALOCHORTUS LUTEUS OCULATUS S. Wats. Proc. Am. Acad. **14**: 265. 1879.

No. 7845, collected May 25, on dry gravelly hills in the western part of Redding, Shasta county, where it is locally plentiful. This is the pale flowered form, the flowers nearly white with a small dark eye, surrounded by a bright yellow band.

SMILACACEAE

SMILAX CALIFORNICA (A. DC.) A. Gray, Bot. Cal. **2**: 186. 1880.

Smilax rotundifolia var. *Californica* A. DC. Monog. Phan.

1: 75.

No. 7973, collected June 5, a short distance above Shasta Retreat, Siskiyou county, on the banks of the Sacramento, climbing high over trees and shrubs. It was originally collected by Hartweg in the upper Sacramento valley, and apparently is confined to the northern part of the State.

ORCHIDACEAE

EPIPACTIS GIGANTEA Dougl.; Hook. Fl. Bor. Am. **2**: 202. *pl.*
202. 1840.

No. 7975, collected June 5, on a wet bank along the railroad near Shasta Retreat, Siskiyou county. The plants are unusually small, only about 2 dm. high, and at first were not recognized. The elevation is about 2400 feet. The original stations are "on the subalpine regions of the Blue and Rocky Mountains. *Douglas*. Columbia River, about Fort Vancouver. *Dr. Scouler*." The latter station is comparatively near sea level, showing a great altitudinal range. It occurs almost throughout California in damp or wet places in the hills and mountains.

LIMNORCHIS THURBERI (A. Gray) Rydb. Bull. Torr. Club, **28**:
624. 1901.

Habenaria Thurberi A. Gray, Proc. Am. Acad. **7**: 389.
1868.

No. 7979, collected June 5, on wet banks along the railroad near Shasta Springs, Siskiyou county, where it is abundant. This species is much more common in California than *L. leucostachys*, with which it has been confused. The type was collected in Arizona by Thurber.

SALICACEAE

POPULUS FREMONTII S. Wats. Proc. Am. Acad. **10**: 350. 1875.

No. 7636, collected in fruit April 10, on the banks of Kern river near Bakersfield, Kern county. It is plentiful in that section along stream banks or in low moist irrigated ground, usu-

ally a large tree. The type was collected by Fremont in 1846, "on Deer Creek at 'Lassen's' in the Upper Sacramento Valley," in Tehama county.

SALIX BAKERI Seemen, Bull. Torr. Club, **30**: 635. 1903.

No. 7263, flowering specimens collected March 12, 1904, mature leaves September 2, 1905, on the foothills west of Los Gatos, Santa Clara county. The specimens were taken from a low, wide-spreading tree about fifteen feet high. It is common in moist places on the lower hills about Los Gatos.

SALIX EXIGUA Nutt. Sylva, **1**: 75. 1842.

No. 7591, collected April 6, in low moist ground about two miles west of Bakersfield, Kern county, along the Santa Fe railroad. A low shrub, 6 or 8 feet high, with numerous slender erect branches. The leaves are silky on both sides with appressed hairs, sessile or nearly so, the largest 4 or 5 cm. long, 6 or 7 mm. wide, usually somewhat falcate, shortly acuminate, abruptly narrowed below, remotely denticulate. The mature pistillate aments are 3 cm. long, on peduncles 1 cm. long; capsule shortly stalked, glabrous; stigmas sessile. For the present our plant is referred to this species, but it does not accord very well.

SALIX FLUVIATILIS Nutt. Sylva, **1**: 73. 1842.

8 No. 7845, collected May 29, on sandy banks of the Sacramento at the bridge near Redding, Shasta county, altitude about 515 feet. Both male and female specimens were obtained, the plants growing side by side.

No. 8058, collected June 17, with male flowers and young fruit, on the headwaters of the Sacramento river west of Sisson, Siskiyou county, altitude about 3000 feet. Although Professor Rowlee does not cite this species as occurring in California or on the Pacific slope in his paper in Bull. Torr. Club, **27**: 254, my specimens will not fit under any other species according to his key. The leaves are hardly coriaceous, shortly appressed pubescent beneath, on petioles of about 2 mm., the largest 7 cm.

long, 5 mm. wide, remotely denticulate, shortly acuminate. The capsules are on pedicels 1 mm. long, and some of the stigmas appear as if borne on short styles. The flowering rachis, pedicels and bracts are clothed with short glandular hairs.

SALIX HINDSIANA Benth. Pl. Hartw. 335. 1857.

No. 7884, collected May 29, on sandy banks of the Sacramento at the bridge near Redding, Shasta county, the female plant only. It is a spreading shrub about eight feet high. The leaves are entire, with slightly revolute margins, the largest about 5 cm. long, 4 mm. wide, shortly acuminate, the base narrowed, petioles 2 mm. long. Bentham says "stylus brevissimus, bipartitus, lobis stigmatosis profunde bifidis," and so it is in our specimens, the stigma appearing as if 4-lobed. This species has been referred to *S. argophylla* by Professor Rowlee, but Bentham's description seems not to warrant this disposition, the narrow leaves and distinct style throwing it out of that species.

SALIX LASIANDRA Benth. Pl. Hartw. 335. 1857.

No. 8032, collected June 15, in mature fruit at Sisson, Siskiyou county, in wet places, elevation 3555 feet. It occurred as a spreading shrub 10 or 12 feet high. Hartweg collected the type "ad flumen Sacramento," probably not far from the site of the present town of Butte, Butte county. It was described from the male plant only.

SALIX LASIOLEPIS Benth. Pl. Hartw. 335. 1857.

No. 7559, collected March 21, along the levee of Sutter creek at Marysville, Sutter county, in fairly mature fruit, exhibits the characteristic hairy flowering rachis of this species, which Hartweg collected "ad ripas fluviorum Salinas et Carmel prope Monterey." Our specimens were taken from a small tree about 15 feet high.

No. 7717, collected April 18, in rich soil in a ravine back of Girard station in the Tehachapi mountains, Kern county, also in fruit. It has the leaf of this species, with shining upper

and whitened lower surface, but the flowering rachis is not very hairy. Otherwise it does not seem to differ.

SALIX NIGRA Marsh. Arb. Am. 139. 1785.

No. 7950, collected June 3, on rocky banks of the Sacramento between Middle Creek station and Keswick, Shasta county. The specimens, in mature fruit, were from a symmetrical shrub about ten feet high.

CORYLACEAE

✓ CORYLUS CALIFORNICA (A. DC.) Rose

Corylus rostrata var. *Californica* A. DC. Prodr. 16: Part 2, 133. 1864.

No. 7971, collected June 5, near Shasta Springs, Siskiyou county. It is common in the Coast Range, extending north into Washington. The type is the *C. rostrata* of Benth. Pl. Hartw. 336, collected by Hartweg "in sylvis prope Santa Cruz."

URTICACEAE

URTICA BREWERI S. Wats. Proc. Am. Acad. 10: 348. 1875.

No. 7596, collected April 6, along the Santa Fe railroad about one mile west of Bakersfield, Kern county, in moist ground, the plants about five feet high. The original was collected at "Los Angeles, California, frequent in waste places (Brewer, n. 95)."

PARIETARIA FLORIDANA Nutt. Gen. 2: 208. 1818.

No. 7778, collected April 26, on steep northerly slopes about a mile inside Kern canyon, Kern county. This is one of the forms referred to *P. debilis*, but that species hardly occurs with us. Perhaps the number here referred to is not *P. floridana* either, the type of which was collected "near St. Mary's West Florida," but it seems best to refer it here for the present.

SANTALACEAE

COMANDRA CALIFORNICA Eastw. ined.

No. 7937, collected June 1, near Shasta Retreat, Siskiyou

county, in rich loose soil in woods. It is rather common in that section, and is also widely distributed in the State.

ASARACEAE

ASARUM MAJUS (Ducharte) Coville, Cont. U. S. Nat. Herb. **4**: 192. 1893.

Asarum Hookeri var. *majus* Ducharte, in DC. Prod. **15**: Part I, 424. 1864.

Asarum Hartwegi S. Wats. Proc. Am. Acad. **10**: 346. 1875.

No. 7989, collected June 5, on the plateau just above Shasta Springs, Siskiyou county. It is common in that region, but is less frequent at elevations under 3000 feet, although a few plants were noted as low as 2400 feet. Plants without mottled leaves are rare. The type is Hartweg's 364 from "montibus Sacramento," somewhere along Bear river in Nevada county.

ARISTOLOCHIA CALIFORNICA Torr. Pac. R. R. Rep. **4**: 128. 1857.

No. 7882, collected in fruit May 29, on sandy river banks at the bridge near Redding, Shasta county. It is plentiful there as it is also at other places, but twining over shrubs and trees as it does, is often passed by unnoticed. Bigelow obtained the type at Corte Madera, Marin county.

POLYGONACEAE

PTEROSTEGIA DRYMARIOIDES F. & M. Ind. Sem. Petrop. **2**: 48. 1835.

No. 7571, collected March 22, on the summit of the ridge east of South Butte, Marysville Buttes, Sutter county, growing on the north side in damp places under overhanging rocks, the plants green throughout and weak, sparingly pubescent, the leaves of almost uniform size. The type is from Bodega Bay, Sonoma county, where it is common, growing in almost pure sand.

No. 7731, collected April 20, is from open stony hillsides at Sunset, Kern county. Here the plants had little protection, growing in small tangled mats among other low herbs. This is a more pubescent form than 7571, the stems mostly reddish, the upper leaves barely half the size of the lower ones.

No. 7780, collected in Kern canyon, Kern county, about a mile above its mouth. This is very similar to 7731, but larger, the lower leaves proportionately large. It grew in sheltered places among larger plants.

HOLLISTERIA LANATA S. Wats. Proc. Am. Acad. **14**: 296.
1879.

No. 7741, collected April 22, on dry open hills at Oil City, near Bakersfield, Kern county, where it is abundant. The type was collected in Cholame Valley, Monterey county, by Lemmon. Its occurrence at Oil City, practically in the Sierra foothills, is a notable extension of the range.

CHORIZANTHE MEMBRANACEA Benth. Trans. Linn. Soc. **17**:
419. *pl. 17. f. 11.* 1837.

No. 7777, collected April 26, on steep slopes among other herbs in Kern canyon, Kern county, about a mile above its mouth, where it occurred sparingly. It is the most widely distributed species of the genus in California, having a north and south range of not less than 500 miles. Douglas got it in "California," somewhere in the coast region.

CHORIZANTHE XANTI S. Wats. Proc. Am. Acad. **12**: 272. 1878.

No. 7797, collected April 29, at McKittrick, Kern county, growing on dry stony hills just south of the town, which is the most northerly station recorded. It was first collected about 60 miles to the southeast, at Fort Tejon, by C. L. Xantus.

Mucronea Benth. Trans. Linn. Soc. **17**: 419. *pl.* 19.
1836.

Mucronea perfoliata (A. Gray)

Chorizanthe perfoliata A. Gray, Proc. Bost. Soc. Nat. Hist.
7: 148. 1859.

No. 7696, collected April 14, on the desert about two miles north of Randsburg, Kern county, growing in open sandy places, in flower only. The type was collected at Fort Tejon by Xantus. That plants so much at variance with true *Chorizanthe* should be included in that genus does not seem admissible, so it seems best to reinstate Bentham's genus *Mucronea*, containing two species, the present one and the type of the genus, *M. californica* Benth. (*Chorizanthe californica* A. Gray).

ERIOGONUM POLYANTHUM Benth. in DC. Prod. **14**: 12. 1856.

The originals were from "California (Fremont!), ad flum. Sacramento super. (exped. Wilkes!)." The species is figured in U. S. Expl. Exped. **17**: *pl.* 14. *B.*, and on page 443, the further information is given that it was collected on the "headwaters of the Sacramento, Northern California, where it was found also by Col. Fremont and Dr. Newberry." This name has been referred to *E. stellatum* Benth., and that again to *E. umbellatum* Torr.

No. 7870, was collected May 26, at the river bridge near Redding, Shasta county. It appears to be typical, and is common in gravel along the river above Redding.

No. 8008, collected June 9, about a mile east of Montague, Siskiyou county, in an open field in adobe soil, a rather unusual habitat. With the exception of the smaller, blunter leaves, it does not seem to differ from 7870.

ERIOGONUM PUSILLUM T. & G. Proc. Am. Acad. **8**: 184. 1870.

No. 7685, collected April 14, at Randsburg, Kern county, where it is abundant on stony hillsides. The type is from the "foot-hills of the Trinity Mountains, borders of the Truckee

Desert, Nevada." Our plant is possibly some other species, but is referred here for the present.

ERIOGONUM ANGULOSUM Benth. Trans. Linn. Soc. **17**: 406. *pl.*
18. f. 1. 1837.

No. 7747, collected April 22, in a ravine at Oil City, near Bakersfield, Kern county, growing in open, sandy places. This is not typical *E. angulosum*, for the type, as shown by the plate, has flower heads twice the size of ours, and critical examination may reveal other more radical differences. A specimen collected near Livermore, Alameda county, by Miss Eastwood, in a region which Douglas probably explored, has the large heads of the type, while all the specimens from more southern stations are like our own.

Eriogonum variabile

Annual, somewhat floccose tomentose except in the inflorescence, about 1 dm. high or less, spreading, broader than high, caulescent: main stem short, 1 or 2 cm. long, then dichotomous or trichotomous, the first internodes about 4 cm. long in large plants, 2 cm. long in small ones, the others shorter, all the stems 6-angled below, 4-angled above: radical leaves spatulate or oblanceolate, 3 or 4 cm. long, acute or obtusish, 7 mm. to 1 cm. wide above, gradually tapering to 3 or 4 mm. at the sessile base; stem leaves sessile, usually a pair at each node, linear or elliptical, acute or acutish, the lowest 1-2 cm. long, 2-6 mm. wide, the upper ones successively shorter; each node with 3 lanceolate, acuminate membranous bracts: filiform pedicels one from each fork, 2 or 3 cm. long in large plants, except the very uppermost, glabrous, purplish: involucre broadly turbinate, hardly 2 mm. high, and of equal width across the top, green, puberulent, the short triangular lobes obtuse, the margins hyaline: bractlets inside the involucre puberulent, dilated and concave above on the inside, the end rounded, hyaline: calices pinkish, 2 mm. long or less, on stipes as long as the involucre, the segments oblong, about 1 mm. wide except toward the slightly dilated and lacer-

ate apex, abruptly narrowed at the very base, marked in the middle with a deep purple line, puberulent, especially on the lower half.

The type is no. 7756, collected April 24, 1905, on the lower slopes of the mountain about three miles southwest of Mojave, Kern county, in the Mojave desert. Miss Stokes has indicated this same thing as a variety of *E. angulosum* in the herbarium of the Academy, but to the writer it seems distinct, marked at once by its different habit, namely, in being caulescent and in the branches diverging and spreading, leaving an open space in the middle.

No. 7796, was collected April 29, at McKittrick, Kern county, on the western side of the valley, 50 miles from Bakersfield. It grew in sandy soil, is diffusely spreading with more slender and longer branches, and is acaulescent or nearly so, the upper leaves more petiolate than in the type.

No. 7732, collected April 20, at Sunset, Kern county, ten or 15 miles south of McKittrick, in the same range of oil producing hills, grew on dry stony hills, and is still more unlike the type in its greener appearance and more diffuse, slender growth, but is evidently the same as 7796.

Eriogonum viridescens

Annual, 1-2 dm. high and as broad or broader, normally caulescent, floccose-tomentose throughout except on the pedicels and flowers: stems terete, rather thick for the size of the plant, the main one 2-4 cm. long, 3 or 4 mm. in diameter, those above gradually a little smaller, more or less dichotomous, leafy: leaves oval, undulate, often somewhat oblique at base, the basal ones as much as 7 cm. long, including the petiole, which is nearly as long as the blade and dilated and clasping at base, the blade 2 cm. wide; leaves at the first node (which is normally trichotomous) with shorter petioles but blade about as large as in the basal ones; those above gradually becoming smaller, the uppermost oblong, sessile: bracts at the nodes 3, oblong, acute, the

lowest ones nearly 1 cm. long, 3 mm. wide, green, floccose, a little connate; those above becoming smaller, the upper ones brownish and glabrous or nearly so on the outside, hairy inside, connate: pedicels filiform, one from each fork, of varying length, but the longest about 2 cm., slightly hairy: involucre campanulate, green, somewhat roughened, about 4 mm high and a little broader, divided to the middle into 5 quadrate-obovate rounded lobes with hyaline margins, the tube part marked with 5 lines or veins: bractlets inside the involucre spatulate, concave within, a little shorter than the involucre: calices greenish, 1 mm. long on stipes nearly three times as long, barely extending beyond the involucre, the lobes cuneate-quadrate, truncate, somewhat puberulent on the outside.

The type is no. 7733, collected April 20, at Sunset, Kern county, on dry stony hillsides, where it was abundant. There are several specimens of it in the herbarium of the California Academy, under the name "*Eriogonum angulosum*," but it is very different from that species, though related to it. The branches and leaves though floccose, show the yellow-green of the the plant through the hairs. One peculiarity is the presence of the veins on the lower half of the involucre.

ERIOGONUM GOSSYPINUM Curran, Bull. Cal. Acad. **1**: 274. 1885.

No. 7748, collected April 22, at the foot of China Grade near Bakersfield, Kern county, is from type locality. Mrs. Curran collected it "near Bakersfield, July, 1884," where it is plentiful on the dry plains. It is a species remarkable on account of the cottony appearance of its flowers.

ERIOGONUM CLAVATUM Small, Bull. Torr. Club, **25**: 50. 1898.

No. 7693, collected April 14, on open stony hillsides at Randsburg, Kern county, in the Mojave desert. The type came from the "mountains of northern Lower California," collected by Orcutt, and its occurrence even so far north as the Mojave desert is unexpected, but Miss Eastwood has collected it near New Idria, San Benito county, and at Estrella, San Luis Obispo county, localities still much farther north.

Eriogonum capitatum

Perennial: stem tall, stout, 8-10 dm. high, simple below, becoming dichotomous or trichotomous about 3 dm. from the base, the branches erect and naked, again once or twice branched, clothed with a persistent cottony pubescence: leaves all glabrous or nearly so above, whitened below with a dense short felt-like tomentum, mostly basal; these with oblong blade about 5 cm. long, 2.5 cm. wide, of nearly equal width throughout, the broad apex rounded and obtuse, usually somewhat oblique at the base, which is either a little narrowed into the petiole or somewhat cordate, petioles 8 cm. long or less, nearly 2 mm. wide, channeled and usually glabrous above, white below like the blade, dilated at base; leaves several at the first node, with blades ovate, obtuse, about 2 cm. long and nearly as broad, slightly cordate at base, the petioles 1-2 cm. long; those of the several nodes above of similar shape, but reduced and bract-like: flowers terminal on stout peduncles about 1 dm. long, numerous in dense capitate clusters: involucre tubular, a little narrowed below, densely woolly within and without, about 5 mm. long, 2 mm. wide, 5-nerved, teeth nearly obsolete, represented by slight points: calices creamy with yellowish or greenish veins, funnel-form, about 3 mm. long and as broad above, the lobes about equal, obovate-spatulate, villous both inside and out on the lower half: stipes slender, exerted about 2 mm. beyond the involucre, disarticulating at the calyx: akenes narrow-triangular, grayish-brown, shining, 3-winged, the wings not sharp.

The type is no. 8099, collected July 15, 1905, near Nevada City, Nevada county, along the Grass Valley road, growing in gravel.

This species belongs to the *E. nudum* group, but differs from that and all related species in its uniformly floccose pubescence, the numerous flowers in dense capitate clusters, very hairy involucre and pubescent flowers. Its nearest relative is probably *E. affine* Benth., but that has "involucris in capitulo 1-3. . . glabris vel margine lanatis, perigoniis glabris."

ERIOGONUM POLIFOLIUM Benth. DC. Prodr. **14**: 12. 1856.

No. 7736, collected April 20, at Sunset, Kern county, growing in abundance on gravelly open hills in erect tufts about two feet high, the many stems woody below. The type was collected by Fremont "in Sierra Nevada, California," undoubtedly in the Tehachapi range, where it is not uncommon. It is plainly distinct from *E. fasciculatum*, with which some writers have confused it.

PERSICARIA LAPATHIFOLIA (L.) S. F. Gray

Polygonum lapathifolium L. Sp. Pl. 360. 1753.

No. 7839, collected May 6, at Bakersfield, Kern county, common along irrigating ditches.

RUMEX OCCIDENTALIS S. Wats. Proc. Am. Acad. **12**: 253. 1876.

No. 7875, collected May 27, near the railroad one mile above Redding, Shasta county. It is common about Redding in damp places. In the Botany of California the statement is made that "it has been rarely collected in California, being reported only from McCumber's in Shasta county, but is probably frequent in the northern part of the State."

RUMEX SALICIFOLIUS Weinm. Flora, **1**: 28. 1821.

No. 7914, collected May 31, in moist ground along a little stream in the hills near Keswick, Shasta county. It is common almost throughout California, and has a great altitudinal range, occurring at elevations of at least 6000 feet, notably at Donner Lake, on the east side of the Sierra.

CHENOPODIACEAE

CHENOPODIUM MURALE L. Sp. Pl. 219. 1753.

No. 7538, collected September 12, 1904, in fields in the foothills west of Los Gatos, Santa Clara county. The plants are tall, about two feet high, and rather slender. They were growing under an oak tree in cultivated ground.

EUROTIA LANATA (Pursh) Moq. Chenop. Enum. 81. 1840.

Diotis lanata Pursh, Fl. Am. Sept. 2: 602. 1814.

Type locality, "on the banks of the Missouri, in open prairies. *M. Lewis*." In the Botany of California this species is not credited to California except to the east of the Sierra. Mr. Coville, in Cont. U. S. Nat. Herb. 4: 182, reports it from "near the mouth of Tehachapi Pass; and on the desert between Mohave and Willow Spring," both places in Kern county on the desert.

No. 7705, collected April 14, on desert hills at Randsburg, Kern county, elevation about 3000 feet. It occurred here as a shrub about two feet high, the branches gnarled and crowded. Occasional male plants only were noticed.

No. 7737, collected April 20, at Sunset, Kern county, on the western side of the San Joaquin valley, the elevation about 1000 feet. The plants grew on gravelly hills in rather large clumps, the branches spreading and symmetrical. This station, on the eastern foothills of the inner Coast Range, is the most westerly station recorded. The female plant only was collected under this number.

No. 7739, collected April 20, at Sunset, Kern county, in company with 7737, but bearing both male and female flowers. The branches in these plants were more strict and wand-like, in appearance quite different from those of the female plant. The strictly male plant was not noticed here.

ALLENROLFIA OCCIDENTALIS (S. Wats.) Kuntze, Rev. Gen. Pl. 546. 1891.

Halostachys occidentalis S. Wats. Bot. King Rep. 293. 1871.

Spirostachys occidentalis S. Wats. Proc. Am. Acad. 9: 125. 1874.

No. 7793, collected April 29, at McKittrick, Kern county. Quite a grove of it occurs a short distance south of the town in moist sand and clay, near a small alkaline stream, the shrubs about five feet high. Originally recorded by Watson from

"about Great Salt Lake and in alkaline valleys westward to the sinks of the Carson and Humboldt Rivers." In the Botany of California it is said to occur "in the San Joaquin Valley, near the Sacramento," whatever that may mean.

DONDIA CALIFORNICA (S. Wats.) Heller, Cat. 3. 1898.

Suaeda Californica S. Wats. Proc. Am. Acad. 9: 89. 1874.

No. 7794, collected April 29, in low places in alkaline soil near McKittrick, Kern county. The type is from "salt marshes of San Francisco Bay," and is described as shrubby. Our plants are herbaceous, except at the very base, where they are slightly woody, have more flowers, and are less leafy above than the type. It grew in thick clumps, usually not over 18 inches in height.

ALLIONIACEAE

MIRABILIS CALIFORNICA A. Gray, Bot. Mex. Bound. 169 and 173. *pl.* 48. 1859.

No. 7644, collected on low hills one mile west of Pampa station, near Caliente, Kern county, April 11. It is abundant on the hills in that region. Our plant is referred to *M. californica* provisionally, for it is probably undescribed, unless it is one of the species described by Heimerl. in Ann. Conserv. & Jard. Bot. Geneve, 5: 1901; but until that work can be consulted the plant in question had better be disposed of as above. A mere reading of the description of *Oxybaphus laevis* Benth. Bot. Sulph. 44, should show that it and *Mirabilis californica* are two different things.

PORTULACACEAE

CALYPTRIDIMUM MONANDRUM Nutt. T. & G. Fl. N. A. 1: 198. 1838.

No. 7641, collected April 11, one mile west of Pampa station near Caliente, Kern county, on low sandy hills, where it is abundant. Originally from "St. Diego, California," it has been found as far north as Kernville, in the Sierra, and in Santa Clara county in the coast region.

SPRAGUEA UMBELLATA Torr. Pl. Frem. 4. *pl.* 1. 1850.

Calyptridium umbellatum Greene, Bull. Torr. Club, **13**:
144. 1886.

No. 8052, collected June 17, along the railroad between Sisson and Barnard station, Siskiyou county. It is not uncommon in that region, at the foot of Mt. Shasta, in sandy ground. Type locality, "forks of the Nozah River, in the foothills of the Sierra Nevada of Northern California." This stream is said to be a branch of the Sacramento west of Lassen Peak, which would place it in Shasta county. It ascends to 7000 feet in the Sierra, and is found on the high peaks of the Coast Range.

MONTIA DEPRESSA (A. Gray) Suksd. Deutsche Bot. Monats. **16**:
221. 1898.

Claytonia parviflora var. *depressa* A. Gray, Proc. Am. Acad.
22: 281. 1887.

Montia parviflora var. *depressa* Robinson, Syn Fl. **1**: Part
1, 274. 1897.

No. 7924, collected June 1, near Dunsmuir, Siskiyou county, growing under trees not far from the railroad. It was noticed at only one place, and apparently never before recorded from California.

MONTIA PARVIFLORA (Dougl.) Howell, Erythea, **1**: 38. 1893.

Claytonia parviflora Dougl.; Hook. Fl. Bor. Am. **1**: 225.
pl. 73. 1833:

Claytonia perfoliata var. *parviflora* Torr. Pac. R. R. Rep.
4: 71. 1857.

Type locality, "abundant along the course of the Columbia in open parts of the forest where wood has been burned, or the ground turned up by deer."

No. 7716, collected April 18, near Girard station, in the Tehachapi mountains, Kern county, in a ravine in rich moist soil. The plants were low, 1 dm. high or less, growing in dense masses. In some of the smaller plants the basal leaves are nearly as long as the flowering stems.

No. 7900, collected May 30, in a meadow about two miles northeast of Redding, Shasta county. Here the plants were growing among tall grass and other herbs and consequently of a taller and stricter growth, about 3 dm. high.

Montia obtusata

Apparently perennial: the caudex ascending, prolonged into a thick (3 mm.) sterile shoot 5 or 6 cm. long: stems many from the base of the caudex, slender, ascending, 2 dm. high, leafy, their bases enlarged and membranous: leaves veined, those on the sterile shoots obovate or oblanceolate 3 cm long including the petiole, 6 or 7 mm. wide, the petiole about 12 mm. long, 2 or 3 mm. wide; lower stem leaves like those of the sterile shoots but smaller, those above gradually becoming fewer and smaller, reduced to linear sessile bracts; leaf axes, especially the upper ones, bearing deciduous leafy buds: pedicels filiform, ordinarily under 2 cm. in length: sepals round-obovate, 2 mm. across: flowers few, racemose, white or pinkish, about 7 mm. long, the petals obovate, 3 or 4 mm. wide across the blunt top which is cut for about 2 mm. by a V-shaped notch: seeds ovoid or fig-shaped, black, rather dull, marked by innumerable small pits.

The type is no. 7945, collected June 1, 1905, on moist banks near Shasta Retreat, Siskiyou county. This is mostly the *Montia parvifolia* of recent authors, at least as to the Californian plant, but the original of that Alaskan species had "foliis enerviis," and "petalis acute and breve bifidis."

ALSINACEAE

SILENE LEMMONI S. Wats. Proc. Am. Acad. **10**: 342. 1875.

No. 8036, collected June 15, on the first ridge west of Sisson, Siskiyou county. It is plentiful, growing in mats near conifers, about midway up the ridge. This is the form described in Proc. Am. Acad. **22**: 469, as *S. longistylis* Engelm., which was collected in the same region on Scott Mountain.

Our specimens, however, are less canescent than Engelmann's original. The type of *S. Lemmoni* was collected in Sierra county.

ARENARIA DOUGLASII (Fenzl) T. & G. Fl. N. A. 1: 674. 1840.

Alsine Douglasii Fenzl, Ann. Wiener Museum (1833 according to Greene, Fl. Fran. 124).

Type collected somewhere in the coast region by Douglas. It is well distributed throughout California in both the Coast Range and Sierra, but apparently not in the desert nor in the lowlands in the great interior valley, although found in the hills on its borders.

No. 7806a, collected May 1, on the first ridge west of Keene station in the Tehachapi mountains, Kern county. Many of these plants are sparingly branched and rather strict.

No. 8084, collected June 22, on dry banks along the railroad about midway between Igerna and Weed, Siskiyou county. Here the plants were much branched and spreading.

RANUNCULACEAE

PAEONIA BROWNII Dougl.; Hook. Fl. Bor. Am. 1: 27. 1829.

No. 7994, collected June 8, on the hills west of Yreka, Siskiyou county, growing in dry ground, the elevation about 3000 feet. The middle segment of each leaf division is sometimes obtuse, the others acute; plant glaucous. The type was found by Douglas "near the confines of perpetual snow, on the subalpine range of Mt. Hood, North-West America, 1826. Fl. June, July."

ISOPYRUM OCCIDENTALE H. & A. Bot. Beech. 316. 1840.

No. 7715, collected April 18, near Girard station in the Tehachapi mountains, Kern county, growing in rich loose soil under oak trees in a ravine. Except that the plants are smaller and more spreading, these specimens do not seem to differ from those from about San Francisco, the type locality. It has never been reported from so far south, the farthest being Coburn Mills,

Tulare county. The sepals are tinged with pink in the living plant, changing to purplish when dry.

DELPHINIUM GREENEI Eastw. Bull. Torr. Club, **28**: 674. 1901.

No. 7803, collected May 1, on the first ridge west of Keene station in the Tehachapi mountains, Kern county. It was seen at one place only, growing in rich ground on a grassy northerly slope near trees and shrubs. The upper petals are rather spreading, the upper edges not meeting, as they do in *D. patens*, its northern relative. Type locality, Coburn Mills, Tulare county, collected by Brandegee.

DELPHINIUM RECURVATUM Greene, Pittonia, **1**: 285. 1889.

Originally recorded as "frequent in moist subsaline grounds along the San Joaquin River in California, from Antioch to Tulare, flowering in March and April." It is now known from the lower Sacramento valley, where it was collected by the writer in 1902 near Winters, Yolo county, no. 5399.

No. 7633, collected April 8, along the bluffs of Kern river opposite Oil City near Bakersfield, Kern county, and later was seen at Oil City. It grows on rather steep slopes in sandy or gravelly ground. This station is considerably farther south than any previously recorded, but the plant seems to be the same as the northern one. Perhaps a description of *D. recurvatum* drawn from living material may show specific differences, for the flowers in this genus furnish excellent characters never mentioned in descriptions made from dried plants. The writer has a description of this no. 7633, made from the living plant, but since nothing in the way of comparison can be gained at the present time, it does not seem advisable to print it.

No. 7738, collected April 20, at Sunset, Kern county, 50 miles southwest of Bakersfield. This grew on hillsides near the town, and differs somewhat from 7633. The flowers are slightly smaller, the sepals less spreading, and the lower petals divided nearly to the middle instead of merely notched or rounded. In the Synoptical Flora, page 51, *D. recurvatum* is included under

"recently published species of uncertain affinities." It is close to *D. hesperium*, and no doubt included under that species by Gray. Its relationship is well shown by its being placed next to *D. hesperium* in the *Flora Franciscana*, issued in 1891.

Delphinium roseum

Perennial, root fascicled, elongated, not tuberiform: herbage crisp like fresh lettuce, easily broken when fresh: stem hollow, stout, about 6 dm. high, pale, leafy in the lower half, commonly simple but sometimes with several flower-bearing branches, pubescent with short hairs, some of them glandular: lower leaves on pubescent petioles 1.5 dm. long, the upper ones shorter; blade thin, bright yellow-green, nearly or quite glabrous except on the margins, orbicular in outline, the largest 7 or 8 cm. across, 3-parted, the divisions frequently uneven, again parted so as to give the whole a 5-lobed appearance, the lobes coarsely several toothed, these either broad and rounded or acutish, but all with a short apiculation; sinus at the base closed by the overlapping lobes; the two or three leaves just below the inflorescence much reduced, composed of one or more lanceolate lobes: inflorescence occupying the upper half of the stem: pedicels slender, ascending (erect in fruit) pubescent like the stem and leaves, the lower ones in flower a little longer than the spur, the others equalling it or shorter, each subtended by a small (2-4 mm.) lanceolate, acuminate bract: flowers rose-pink; sepals ovate or elliptical, 1.5 cm. long, 5 mm. wide, spreading and not touching except at the very base; spur about 1.5 cm. long, 3 mm. across, at first somewhat curved, becoming nearly straight, a little pubescent: upper petals whitish, ascending, 8 or 9 mm. long, 3 mm. wide at the oblique base of the blade, the rounded apex 2 mm. wide, sometimes slightly notched; lower petals colored like the sepals, 2 mm. shorter than the upper ones, apparently standing almost horizontally, the blade obliquely ovate, 2 mm. wide, split nearly to the middle, pubescent along the center: pods 2 cm. long, 1 cm. wide, reticulated with dark veins, the aristate apices of the divisions somewhat diverging: seeds immature.

The type is no 7655, collected April 12, 1905, on the rocky ridge to the north of the mouth of Kern canyon, Kern county, California. Later the plant was seen on the opposite side of the river. It grew about rocks in sheltered situations, usually several stems in a clump. It is a handsome species remarkable for its rose-pink flowers and crisp herbage. Its position in the Synoptical Flora would probably be near *D. andersonii* and its two relatives, page 48.

RANUNCULUS LUDOVICIANUS Greene, Bull Cal. Acad. 2: 58.
1886.

No. 7829, collected May 5, at the type station, in moist ground along the railroad a short distance west of Tehachapi, Kern county, where Mrs. Brandegee found it in 1884. It is a handsome species, the flowers having a diameter of 2 cm. or more. The petals are less glossy than are those of *R. californicus*, and as in that species are ten or more in number.

Ranunculus longilobus

Perennial, roots fibrous, thickish, nearly 2 mm. in diameter, from a thickened erect caudex 1 or 2 cm. long: stems usually several, 4 dm. high, sparingly branched above, somewhat strigose pubescent, especially below: leaves mostly basal on petioles 1-1.5 dm. long, pubescent like the stem; blades pubescent with appressed hairs but not whitened, broadly ovate in outline, the largest 5 cm. long and as wide, 3-parted, the long divisions two or three-lobed and these again similarly cut into lanceolate acute segments, the central main lobe usually cuneate with a broad base; stem leaves one below each branch, only the lowermost approaching the basal leaves in shape, the divisions all narrow, linear or lanceolate; the uppermost reduced to linear bracts: flowers rather few; sepals yellow, reflexed, ovate-lanceolate, about 4 mm. long, pubescent externally: petals bright yellow but hardly glossy, about 6 in number, elliptical-oblong, 8 mm. long, 3-4 mm. wide, all rounded at apex: akenes 5-8 in low-ovoid heads, the body thin, glabrous, oblique-orbicular, 4mm.

in diameter, yellowish, the edge green-rimmed, the hooked beak nearly 2 mm. long, the base broad, the point slender.

The type is no. 7912, collected May 31, 1905, on hills about one mile back of Middle Creek station near Keswick, Shasta county, California, growing in damp ground near a little stream. This species, if previously collected, has no doubt been called either *R. californicus* or *R. occidentalis*, but can not well be referred to either. Typical *californicus* has smaller, differently shaped akenes, more numerous glossy petals, and dissimilar leaves. True *occidentalis* from near the mouth of the Columbia river is rare, though the name is often used for something else.

PAPAVERACEAE

HESPEROMECON LINEARE (Benth.) Greene, Pittonia, **5**: 146.

1903.

Platystigma lineare Benth. Trans. Hort. Soc. II. **1**: 407.

1835.

No. 7807, collected May 1, on the first ridge west of Keene station in the Tehachapi mountains, Kern county. This is the place where Mrs. Curran obtained her specimens in 1884, and it is abundant within a limited area, growing in grassy open places. According to Professor Greene this species has been found at no other place in recent years, the only other specimen known being the original of Douglas, and the place where he found it is not known. The scapiform peduncles are pubescent with spreading, somewhat wavy hairs, the petals marked with orange spots at both base and apex, or in some plants at base only.

PLATYSTEMON ANEMONOIDES Greene, Pittonia, **5**: 177. 1903.?

No. 7603, collected April 6, on the rising ground back of Kern City, Kern county, in both flower and fruit. This is not typical *P. anemonoides*, as shown both by the type and description, but agrees no better with the other species. The differences are: petals not "narrow, mostly spatulate-oblong," but broadly obovate, about 12 mm. long, 8 or 9 mm. wide, and the carpels are glabrous. Miss Eastwood collected this same plant

at Bakersfield, and Professor Greene has referred it with doubt to *P. anemonoides*. Another specimen of the same thing also from near Bakersfield, March 23, 1893, he has marked "*P. elegans?*" but it has many more and larger stamens than the type of *elegans*. Our plant is common on the elevated plain back of Bakersfield, as well as on the hills 15 miles to the east.

PLATYSTEMON PROXIMUS Greene, Pittonia, **5**: 172. 1903.?

No. 7570, collected March 22, in grain fields near Sutter City, Sutter county. The type of this species was collected near Chico, Butte county, a point about 35 miles farther north. I do not know whether these plants belong to this species, or whether *P. proximus*, as well as some of the others, should be referred to *P. leiocarpus* (*P. emarginatus* Greene), as defined by Fedde in Deutsch. Bot. Gesell. **22**: 94. 1904. The species in this genus could perhaps be determined better if their number were somewhat reduced and stronger constant characters brought out.

Eschscholtzia helleriana Greene, Pittonia, **5**: 229. 1905.

No. 6638, collected April 29, 1903, at Pacific Grove, Monterey county, in sandy soil in a vacant lot near the upper end of 17th street, where it was abundant, growing in large clumps, the numerous stems spreading and ascending. Specimens of this number, the early flowering state, were sent to Professor Greene for determination, but he makes no mention of it in the diagnosis of the species.

No. 6860, collected July 4, 1903, at the same spot as 6638. This is the late flowering stage, also bearing mature fruit, and is designated as the type of the species.

ESCHSCHOLTZIA MACRANTHA Greene, Pittonia, **5**: 242. 1905.

No. 7826, collected May 5, at Tehachapi, Kern county, where it is abundant over the whole plateau, growing in small clumps or in large patches, the deep orange-red of the flowers enlivening the landscape. Flowers measuring 7 inches were

reported, while those with a spread of 4 or 5 inches were not uncommon. It was the only member of the genus noticed there at the time. The type was collected near Visalia, Tulare county, and if near the town at a point over 3000 feet lower, for Tehachapi is at an elevation of nearly 4000 feet. Some of the specimens show the persistent calyx under the open flower. The flowers have faded to a pale yellow, thus losing much of the beauty presented in the living state. One would expect this to be *E. rigida*, the type of which was collected at Tehachapi, but it does not answer to the description of that species.

ESCHSCHOLTZIA RECTA Greene, Pittonia, **5**: 245. 1905.

Type for flower, Baker, 2921, from near Elmira, Solano county; seeds from a specimen from Antioch, Contra Costa county.

No. 7903, collected May 30, in a meadow about two miles northeast of Redding, Shasta county. The calyx in maturity is ovate, 12 mm. long including the apiculation of 3 mm., 5 or 6 mm. across: pods about 4 cm. long, and the seeds as described. So far as locality is concerned this should be *E. shastensis*, but does not answer to the description of that species.

No. 8002, collected June 8, at Yreka, Siskiyou county. In these specimens the calyx is larger, abruptly acuminate, the acumination 4 mm. long. Some of the pods are 9 cm. long, the seeds examined immature, greenish. The same thing apparently, is plentiful in Shasta Valley between Edgewood and Montague. According to range this should be *E. confinis*, but it does not seem to differ materially from no. 7903.

ESCHSCHOLTZIA THERMOPHILA Greene, Pittonia, **5**: 256. 1905.

No. 7765, collected April 26, about a mile inside of Kern canyon, Kern county, growing on steep slopes. This is one of the most distinct of the recently described species, and our plants are typical, matching exactly the type in the herbarium of the California Academy, collected by Brandegee near Caliente. Our station is only a few miles from Caliente in an air

line. The species is remarkable for its thin leaves, deep green above, with broad segments. The flowers are deep orange; and the plant is probably abundant, since one having flowers with such color grows in immense quantities on the surrounding ridges, some of the patches so large that they may be seen when many miles distant.

ESCHSCHOLTZIA COVILLEI Greene, Pittonia, **5**: 275. 1905.

No. 7683, collected April 14, at Randsburg, Kern county, on stony desert hillsides. It is not uncommon, the flowers rather bright yellow, fully an inch in diameter. In many respects this resembles *E. hypocoides*, but as it also has features in common with *E. covillei* and the range is more suitable for that species, it is referred thereto.

ESCHSCHOLTZIA MINUTIFLORA S. Wats. Proc. Am. Acad. **11**: 122. 1876.

No. 7672, collected April 13, at Kramer, San Bernardino county, in the Mojave desert. According to Greene's key and description this number belongs only here and not under *E. micrantha* as might be expected, for it comes from the region where Mrs. Curran obtained the type of the latter. It occurs as scattered individuals, the petals fugacious, yellow, 6 mm. long.

ESCHSCHOLTZIA CRUCIATA Greene, Pittonia, **5**: 279. 1905.

No. 7608, collected April 6, on the rising ground back of Kern City, Kern county. Miss Eastwood obtained it in this vicinity April 8, 1893. The flowers are orange, and as the plant is abundant, often growing over large areas, it is one of the features of the landscape in early spring. The pale calyx is a little curved at the apex; the very dark seeds nearly round, barely 1 mm. in diameter, slightly tuberculate. It seems to be a well marked species in both foliage and calyx.

ESCHSCHOLTZIA LOBBII Greene, Pittonia, **5**: 290. 1905.

No. 7575, collected March 22, at middle elevations on the eastern slope of the ridge east of South Butte, Marysville Buttes,

Sutter county. It grew in scattered tufts here and there among the grass, the yellow flowers resembling some of the evening primroses.

✓ MECONOPSIS HETEROPHYLLA Benth. Trans. Hort. Soc. II. 1: 40. 1835.

Papaver heterophyllum Greene, Pittonia, 1: 168. 1888.

No. 7599, collected April 6, along ravines on the rising ground back of Kern City, Kern county. In this form the flowers are small, 1 cm. long, barely exceeding the ovary, the petals red with dark purple, almost black base; peduncles erect when in flower; capsule narrowly obovoid, very gradually narrowed to the base. It is not uncommon about Bakersfield.

MECONOPSIS CRASSIFOLIA Benth. Trans. Hort. Soc. II. 1: 40. 1835.

No. 7766, collected April 26, about a mile within Kern canyon, Kern county, growing on steep northerly slopes. The flowers of this are also red with a dark eye, but inclined to nod, and are large, fully 4 cm. in diameter. The capsule is broadly obovoid, suddenly narrowed to the base. That this plant is distinct from 7599, seems evident, but whether *crassifolia* is distinct from *heterophylla* is an open question. A difference in leaf outline is about the only point brought out in the description, and Bentham states that "the flowers of both are of an orange red, about the size of those of *Papaver Argemone*."

FUMARIACEAE

✓ BICUCULLA FORMOSA (Andr.) Howell, Fl. N. W. Am. 33. 1897.

Fumaria formosa Andr. Bot. Rep. 6: pl. 393. 1800.

Corydalis formosa Pursh, Fl. Am. Sept. 2: 462. 1814.

Diclytra formosa DC. Syst. 2: 109. 1821.

Capnorchis formosa Kuntze, Rev. Gen. Pl. 15. 1891.

No. 8021, collected June 13, near Shasta Springs, Siskiyou county, growing in wet places along the railroad. It usually grows in colonies, the plants crowded, and while noted at several places it does not seem to be common in that region.

BRASSICACEAE

THELYPODIUM BRACHYCARPUM Torr. U. S. Expl. Exped. **17**:
231. *pl. 1*. 1874.

Originally collected "on the Klamet River, southern borders of Oregon," but the statement is made in Bot. Cal. that it was "probably on the Upper Sacramento," a region in which the species has never been found, nor is it likely to be, unless as a chance introduction.

No. 8011, collected June 9 in flower at Montague, Siskiyou county. It is abundant throughout the Shasta valley, often growing in large patches in low places. As the Klamath river is only thirteen miles from Montague, our specimens may possibly be from near type locality.

THELYPODIUM COOPERI S. Wats. Proc. Am. Acad. **12**: 246.
1876.

No. 7680, collected April 14, at Randsburg, Kern county, growing near rocks on the hills and in considerable quantity. The flexuous stems give the plant a weak appearance. Originally collected "by Dr. J. G. Cooper near Fort Mohave," a point not many miles west of Randsburg.

THELYPODIUM LASIOPHYLLUM (H. & A.) Greene, Bull. Torr.
Club, **13**: 143. 1886.

Turritis lasiophylla H. & A. Bot. Beech. 321. 1840.

No. 7605, collected April 6, on the dry elevated plain east of Kern City, Kern county, sheltered by low shrubs. The uppermost leaves are nearly or quite entire in these plants, all thin, bright green, the young pods at first ascending, later deflexed.

No. 7751, collected April 24, on the lower slopes of the mountain about three miles southwest of Mojave, Kern county. In these specimens, which were from a northerly slope near a ledge of rock, all the leaves are pinnatifid, the pods deflexed, the uppermost ones with the end curved upward.

CAULANTHUS INFLATUS S. Wats. Proc. Am. Acad. 17: 364.
1882.

Streptanthus inflatus Greene, Fl. Fran. 257. 1891.

No. 7702, collected April 14, at Johannesburg, Kern county. The "squaw cabbage," as it is locally designated, is abundant at intervals on the Mojave desert, and near Johannesburg and Randsburg is found on the slopes of the low mountains. No definite station for the original is stated except "Mohave Desert, California." The flowers are described as purple, but this is so only in the bud, for after expansion only the lobes of the calyx are purple, the tube and the petals white.

No. 7724, collected April 20, at Sunset, Kern county, 50 miles west of Bakersfield on the edge of the inner Coast Range. It has also been collected as far north as Alcalde, Fresno county. These Sunset specimens are nearly past flowering, and the upper part of the stem has lost much of the inflation so characteristic of the flowering state. It was rather abundant on gravelly slopes about a mile southwest of the town. This whole region is rather peculiar, and has furnished several species formerly supposed to occur only on the desert beyond the Tehachapi range.

CAULANTHUS COULTERI S. Wats. Bot. King Rep. 27. 1871.

No. 7768, collected April 26, about a mile within Kern canyon, Kern county, on steep slopes. This answers fairly well to the original description, except that the uppermost leaves are unequally and coarsely serrate, instead of "entire or rarely dentate. The lower leaves are oblanceolate with somewhat clasping base, those of the middle and upper part of the stem cordate clasping, auricled; all are thin, the middle ones 3 cm. wide near the base.

The type was collected in "S. California" by Thomas Coulter. In the Synoptical Flora, 172, it is cited as "*S. Coulteri*, Gray, in Wats. Bot. King Exp. 19." but there the name is merely listed, without description, along with several others which should be excluded from *Streptanthus*.

MICROSEMIA POLYGALOIDES (A. Gray) Greene, Leaflets, **1**: 89.
1904.

Streptanthus polygaloides A. Gray, Proc. Am. Acad. **6**:
519. 1865.

No. 8100, collected July 14, just outside of Grass Valley, Nevada county, along the electric line leading to Nevada City. It occurred in rather moist ground caused by water percolating from a ditch. The type came from "very dry hillsides, in serpentine soil, along the Tuolumne River." Without the fruit, it would indeed be a difficult task to place this strange plant, and Professor Greene has simplified matters by making it the type of a genus distinct from *Streptanthus*.

LEPIDIUM DICTYOTUM A. Gray, Proc. Am. Acad. **7**: 329. 1868.

No. 7594, collected April 6, along the Santa Fe railroad about a mile west of Bakersfield, Kern county. The numerous plants were growing in cinders and sand on the railroad embankment.

LEPIDIUM DRABA L. Sp. Pl. 645. 1753.

No. 8006, collected June 9, at Yreka, Siskiyou county, in a field. The species is found sparingly in California, being reported only from Yreka and Berkeley, and does not seem to spread rapidly. "Habitat in Germania, praesertim Austria, Gallia, Italia."

LEPIDIUM FLAVUM Torr. Pac. R. R. Rep. **4**: 67. 1857.

No. 7676, collected April 13, at Kramer, San Bernardino county, where it is plentiful, prostrate on the sand among the desert vegetation. A yellow flowered *Lepidium* is somewhat of an oddity. Kramer is not far from the type locality, "sandy places near the Mohave Creek."

LEPIDIUM FREMONTII S. Wats. Bot. King Rep. 301. *pl. 4. f. 3.*
f. 1871.

No. 7679a, collected April 14, on the desert hills at Randsburg, Kern county, on northerly slopes, where it grew in abund-

ance, but in flower only at that time. This is the only truly shrubby species of the genus in our flora. Originally found by Fremont "on the Mohave River, a point probably 50 miles south of Randsburg.

LEPIDIUM MONTANUM Nutt.; T. & G. Fl. N. A. 1: 116. 1838.

No. 8068, collected June 19, in the Shasta valley near Grenada station. The plants were prostrate or nearly so, many stems spreading in a mat-like mass. It does not agree altogether with the original, but is nearer it than any of the other species. The type came from "plains of the Rocky Mountains, on the western side to the borders of the Oregon."

LEPIDIUM NITIDUM Nutt.; T. & G. Fl. N. A. 1: 116. 1838.

No. 7562, collected March 21, in low moist ground at Marysville, Sutter county. The stems are glabrous or nearly so, the outer ones decumbent at base, then erect. The type was obtained by Nuttall "near St. Barbara."

No. 7760, collected April 24, at the foot of the mountain about three miles southwest of Mojave, Kern county, growing in gravel. Here it was prostrate, only the middle stems ascending, all rather stout for the size of the plant, decidedly pubescent, as are also the pedicels. It is abundant in the desert, at least near Mojave, and on the dry plains about Bakersfield.

RORIPA PALUSTRIS (L.) Bess. Enum. 27. 1821.

Sisymbrium amphibium var. *palustre* L. Sp. Pl. 657. 1753.

Nasturtium terrestre R. Br. in Ait. Hort. Kew. Ed. 2, 4:

110. 1812.

Nasturtium palustre DC. Syst. 2: 191. 1821.

No. 7595, collected April 6, about a mile west of Bakersfield, Kern county, along the Santa Fe railroad in shallow pools.

RORIPA OCCIDENTALIS Greene, Pittonia, 3: 97. 1896.

Nasturtium occidentale Greene, Fl. Fran. 268. 1891.

No. 7890, collected May 29, in sand at the river bridge near Redding, Shasta county. The stems are depressed or pros-

trate, the smaller plants growing in rosette-like tufts. This is from the type region, "moist low plains bordering the upper Sacramento, and in the foothills adjacent," but may be some other species. Apparently the same thing was distributed by me in 1903 from Donner Lake, no. 6878, as *R. curvisiliqua*. It may perhaps be *R. tenerrima* Greene.

TROPIDOCARPUM GRACILE Hook. Ic. *pl.* 43. 1836.

Tropidocarpum scabriusculum Hook. Ic. *pl.* 52. 1837.

No. 7627, collected April 7, in the narrow valley just east of Caliente, Kern county, growing among grass and other herbs, the plants ascending and rather weak. As this is pubescent, it is probably the form called *T. scabriusculum*. It may be plentiful in that region, but only one small clump was noticed. The type came from Monterey.

TROPIDOCARPUM MACROCARPUM Hook. & Harv.; Greene, Proc. Acad. Phila. 1895: 553. 1896.

No. 7689, collected April 14, at Randsburg, Kern county, where it is plentiful on gravelly hillsides. It is a rather stout plant, decidedly hirsute, prostrate, no part ever ascending, the whole forming a roundish mat; and this feature is constant, not only in open exposed places on the desert, but in pasture land where there is a rank growth of other vegetation. It was observed under the latter condition near the summit of the high ridge west of McKittrick, at Tehachapi, and other places.

ATHYSANUS PUSILLUS (Hook.) Greene, Bull. Cal. Acad. 1: 72. 1885.

Thysanocarpus pusillus Hook. Ic. *pl.* 42. 1837.

No. 7711, collected April 18, on grassy slopes at Girard station in the Tehachapi mountains, Kern county. The species is abundant in this region, and is also one of the most widely dispersed crucifers native to the Pacific coast. Originally from "Monterey, California."

THYSANOCARPUS CURVIPES Hook. Fl. Bor. Am. 1: 69. *pl.* 18.
1829.

No. 7931, collected June 1, opposite Upper Soda Spring, Siskiyou county, on a gravelly wooded slope. The rosette of pinnate basal leaves is wanting, apparently from the first, but the other characters agree fairly well.

Thysanocarpus desertorum

Glabrous, glaucous, yellowish, especially in the inflorescence, maximum height 2 dm, branched from the base, the branches ascending, becoming somewhat racemose: leaves scattered, the lowest ones oblanceolate, about 3 cm. long, 4 or 5 mm. wide, sparingly runcinate-dentate, acute or acutish; those above smaller, nearly linear, not narrowed at the base, clasping but not auricled: pedicels 3 mm. long or less: flowers very small, the sepals obovate-oblong, white or yellowish with broad green mid-vein: petals a little shorter and narrower than the sepals: silicle plane or nearly so, orbicular, 3 mm. across, slightly reticulated, glabrous, minutely crenate but not perforate; the short style not exerted from the notch.

The type is no. 7681, collected April 14, 1905, on rocky hilltops near Randsburg, Kern county, growing under overhanging rocks.

THYSANOCARPUS AFFINIS Greene, Pittonia, 4: 311. 1901.

No. 7617, collected April 7, in the valley a short distance east of Caliente, Kern county, where it was found sparingly near a dry watercourse. This is not typical *T. affinis*, which should not be expected to occur in this region, but is near it in flower and fruit characters. These specimens show a somewhat different leaf, and are scabrous hirsute below. The apex of the silicle is not notched, pointed by the style 1 mm. long. Greene does not mention the style in his description.

Thysanocarpus foliosus

About 5 dm. high, hirsute below, pale and glaucous, branched from near the base, the branches ascending, stout:

lower leaves linear-lanceolate, 6-8 cm. long, about 1 cm. wide, acutish, somewhat hirsute as well as ciliate, sparingly armed with minute retrorse points, the base hastate rather than auricled, the lobes broad and somewhat rounded; upper ones of similar shape but gradually becoming smaller, acute or acuminate, glabrous or nearly so: flowering stems naked, about 2 dm. long; pedicels 5-7 mm. long: sepals purplish, over 1 mm. long, oblong, only the margins white: petals spatulate, slightly longer than the sepals: anthers purplish, a little exserted: silicles round-obovate, 4 mm. across, the margins entire, whitish or purplish, the greenish body somewhat rayed, densely tomentose: short style protruding from a slight notch.

The type is no. 7719, collected April 18, 1905, on the side of a ravine back of Girard station in the Tehachapi mountains, Kern county, California. The species is remarkable for its large, practically entire leaves and tomentose silicles. A relative probably of *T. pulchellus* F. & M., but that is described as "siliculis glaberrimis," a fact overlooked by Greene, for in *Flora Franciscana*, 276, he says "pods densely tomentose."

SOPHIA CALIFORNICA (T. & G.) Rydb. Bull. Torr. Club, **29**: 238. 1902.

Sisymbrium canescens var. *Californicum* T. & G. Fl. N. A. **1**: 92. 1838.

Sisymbrium incisum Californicum Blankinship, Mont. Ag. Coll. Sci. Stud. Botany, **1**: 60. 1905.

No. 7763, collected April 24, in gravel at the foot of the mountain about three miles southwest of Mojave, where it is plentiful. The lower part of the stems and the leaves are grey with very short stellate hairs, and the leaf segments are narrower than in *S. incisum*, the pedicels horizontal instead of ascending, and the seeds red-brown, barely oblong, instead of "linear-oblong, yellow."

ARABIS MAXIMA Greene, Pittonia, **4**: 192. 1900.

Streptanthus arcuatus Nutt.; T. & G. Fl. N. A. **1**: 77.
1838.

Arabis arcuata A. Gray, Proc. Am. Acad. **6**: 187. 1863;
not Shuttleworth.

No. 7772, collected April 26, about a mile inside of Kern canyon, Kern county, in moist sandy soil on the edge of the river, evidently brought down by the stream from higher elevations. Originally found by Nuttall on "shelving rocks on high hills near St. Barbara, Upper California."

ARABIS CAMPYLOLOBA Greene, Pittonia, **4**: 192. 1900.

No. 8083, collected June 22, near the railroad a short distance south of Weed, Siskiyou county, not many miles from Yreka, the type locality. The pods, however, are less strongly arcuate than those of *A. maxima*, a point at variance with the original, but it has the small pale flowers of *A. campylobola*.

CHEIRANTHUS ANGUSTATUS Greene, Pittonia, **3**: 132. 1896.

No. 7713, collected April 18, at Girard station in the Tehachapi mountains, Kern county. It is abundant on the hills from Bealville almost to Tehachapi, the flowers varying from pale yellow to orange. These specimens may possibly not belong to this species, but are nearer it than any of the others so far described. The type of *C. angustatus* came from "sandy banks of the San Joaquin River," a rather indefinite citation, but at most a region considerably removed from the Tehachapi mountains.

ALYSSUM ALYSSOIDES (L.) Gouan, Hort. Monsp. 321. 1762.

Clypeola alyssoides L. Sp. Pl. 652. 1753.

Alyssum calycinum L. Sp. Pl. Ed. 2, 908. 1763.

No. 8054, collected June 17, in sandy soil between Sisson and Barnard station, Siskiyou county. The flowers are yellow at first, changing to white with age. Originally found "in Austria, Gallia, Germania."

CAPPARIDACEAE

CLEOME PLATYCARPA Torr. U. S. Expl. Exped. 17: 235. *pl.* 2.
1874.

No. 8010, collected June 9, at Montague, Siskiyou county. It is common at this place, there being a space of several acres just east of the town completely covered with it, the bright yellow of its flowers in striking contrast with the brown of the adjoining plain. Small colonies of it may be seen at intervals along the railroad throughout the Shasta valley. The type was collected on the "Klamet River, Northern California," a point only a few miles north of Montague.

Isomeris globosa (Coville)

Isomeris arborea globosa Coville, Proc. Biol. Soc. Wash. 7.
73. 1892.

No. 7628, collected April 7, on the slopes of the narrow valley just east of Caliente, Kern county, the type locality. It is abundant in the vicinity of Caliente, first appearing several miles below the town, its range being approximately at elevations between 1000 and 2000 feet, as observed along the railroad. It again appears near McKittrick, at similar elevations west of the town, but here on open gravelly slopes instead of on precipitous rocky hills as at Caliente. Miss Eastwood has collected it at a point still further west, on the boundary between San Luis Obispo and Santa Barbara counties. Mr. Coville's description certainly calls for a plant distinct from *I. arborea*, for the differences he enumerates leave very little that can be "otherwise as the type form."

CRASSULACEAE

SEDUM SPATHULIFOLIUM Hook. Fl. Bor. Am. 1: 227. 1833.

No. 7932, collected June 1, along the railroad opposite Upper Soda Spring, Siskiyou county. It was growing on a steep slope in rich soil near shrubs. Determined by Dr. J. N. Rose from living plants.

SEDUM ANOMALUM Britton, N. A. Fl. 22: 72. 1905.

Gormania anomala Britton, Bull. N. Y. Bot. Gard. 3: 30.
1903.

No. 7422, collected May 16, 1904, in Los Gatos canyon, Santa Clara county, about a mile above Los Gatos, on a steep slope facing the north, the soil rich and loose, the place shaded by trees. It was very abundant, almost covering the ground over a considerable area. This, apparently the second station reported, is very differently situated from the original one on "sandy hills in path of strong daily sea-winds, San Luis Obispo County, Mrs. R. W. Summers, June, 1883." Determined by Dr. J. N. Rose.

SEDELLA PUMILA (Benth.) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 45. 1903.

Sedum pumilum Benth. Pl. Hartw. 310. 1849.

No. 7576, collected March 22, on the eastern slope of the hill east of South Butte, Marysville Buttes, Sutter county. It is plentiful at middle elevations on this ridge, barely in flower on this date. Found by Hartweg "in solo glareoso vallis Sacramento," probably near Chico, a point about 35 miles further north.

DUDLEYA SETCHELLII (Jepson) Britton & Rose, Bull. N. Y. Bot. Gard. 3: 15. 1903.

Cotyledon laxa var. *Setchellii* Jepson, Fl. West. Middle Cal. 267. 1901.

No. 7480, collected June 2, 1904, at Lexington near Los Gatos, Santa Clara county, growing on and about rocks. It is not uncommon in the surrounding hills. This may be some other species, perhaps *D. paniculata*, the type of which came from Niles on the other side of the Santa Clara valley. The leaves and stems are bronzed or reddish, the flowers deep yellow. The pedicels are shorter than the flower, about the length of the calyx and stout when kept under pressure and dried. Some plants were left lying between papers with little or no pressure

for about six weeks. In these all the parts, with the exception of the flowers became elongated, the leaves more oblong in outline, and the pedicels slender, longer than the flowers.

SAXIFRAGACEAE

Micranthes sierrae (Coville)

Saxifraga integrifolia sierrae Coville, Proc. Biol. Soc. Wash. **7**: 78. 1892.

Saxifraga Sierrae Small, Bull. Torr. Club, **23**: 366. 1896.

Saxifraga Oregana Howell, Erythea, **3**: 34. 1895.

No. 8031, collected June 15, in wet meadows at Sisson, Siskiyou county, where it is plentiful. It has a wide range in California, extending from the southern Sierra north into Oregon and Washington, and is said to occur also in the Rocky mountains. The Sisson station, 3550 feet, is probably the lowest elevation reported for it in California. The type was collected "about 8 miles northwest of Whitney Meadows, on the headwaters of Kern River, Sierra Nevada, Tulare County."

PELTIPHYLLUM PELTATUM (Torr.) Engler, Natuer. Pflanz. **3**: Part 2, 61. 1891.

Saxifraga peltata Torr. in Benth. Pl. Hartw. 311. 1849.

Leptarrhena inundata Behr, Proc. Cal. Acad. **1**: 45 and 57. 1855.

No. 7922, collected June 1, on the edge of the Sacramento at Upper Soda Spring, Siskiyou county. This odd but beautiful plant, its thick and woody looking rhizome usually growing in water, is plentiful in the upper Sacramento and its tributaries, found sparingly as far south as Redding. It also occurs in the Sierra at medium elevations.

HEUCHERA MICRANTHA Dougl.; Lindl. Bot. Reg. **15**: pl. 1302. 1830.

No. 8060, collected June 17, on rocks overlooking the Sacramento west of Sisson, Siskiyou county. The original was "found by Mr. Douglas in mountainous woods, near the grand

Rapids of the Columbia." The petals are described as "minuta, lineari-lanceolata, unguiculata, integerrima." The figure represents the calyx lobes as narrowly lanceolate, acute, which is not the case in our specimens, nor in any others examined from California.

Lithophragma austromontana

Rootstocks slender, horizontal, tuberiferous: stem slender, 3 dm. high, nearly naked, glandular puberulent: basal leaves 3 or 4, petioles almost filiform, 4 cm. or less, hirsute with short hairs; blade broadly ovate in outline, the largest 2 cm. across, pubescent like the petiole, 3-divided, the divisions cuneiform with acute base, divided into 3 oblong obtuse lobes, the lateral ones sometimes again slightly lobed, all the lobes with a slight apiculation; stem leaves about two on the lower half of the stem, remote from each other, the lower one shaped much like the basal ones but smaller, the divisions narrower, the petioles shorter; upper leaves reduced to several linear lobes: flowers few at the end of the long scape-like stem: pedicels very slender, glandular pubescent, about 5 mm. long: each subtended by a roundish membranous bract 1 mm. long: calyx coherent with the ovary, marked with a yellow band around the top of the ovary, turbinate, 5 or 6 cm. long, 4 mm. wide, strongly puberulent, the triangular acute lobes 1 mm. long, shortly aristate pointed: petals white, obovate-cuneate, extending 8 mm. beyond the calyx, the largest about 4 mm. wide across the top, cut for about 3 mm. into two or three oblong lobes 1-2 mm. wide: stamens reaching only to the top of the calyx tube: pistils two, short and stout from an enlarged base, extending only to the tops of the filaments, stigmatic ends only slightly enlarged.

The type is no. 7806, collected May 1, 1905, on the first ridge west of Keene station in the Tehachapi mountains, Kern county, growing under or near trees. This is possibly the plant which passes as *L. tenella* in California, since it answers fairly well to Greene's description in *Flora Franciscana*, but true *te-*

nella is described as having the "calyx campanulate, free from the ovary," and is a native of the Rocky mountains. Rydberg, in Mem. N. Y. Bot. Gard. 1: 98, says it is "a very small plant, scarcely 1 dm. high, and with a very small flower . . . the petals are wholly free from the ovary and divided into nearly filiform divisions. A very rare plant."

HYDRANGEACEAE

PHILADELPHUS CALIFORNICUS Benth. Pl. Hartw. 309. 1849.

Philadelphus Lewisii var. *parvifolius* Torr. Pac. R. R. Rep.

4: 90. 1857.

Philadelphus Lewisii var. *Californicus* A. Gray, Bot. Cal.

1: 202. 1876.

No. 7957, collected June 3, along the Sacramento a short distance above Redding, Shasta county. It is common along the river to a point somewhat north of the mouth of Pit river, usually growing in the open on the rocks. The original was from "montibus Sacramento ad ripas umbrosas rivulorum."

GROSSULARIACEAE

RIBES HITTELLIANUM Eastw. Proc. Cal. Acad. III. Bot. 2: 245.

pl. 24. f. 6a. 6b. 1902.

No. 7967, collected June 5, along the Sacramento a short distance below Shasta Springs, Siskiyou county, growing on the edge of a cold mountain stream, the shrub about four feet high, widely spreading. It was also noticed within the inclosure at Shasta Springs, along the trail leading to the hotel. The specimens are in young fruit, but also show the persistent flowers. The elevation is about 2500 feet. The type came from the northwestern part of the adjoining county of Trinity.

No. 8047, collected June 16, back of Sisson, Siskiyou county, along the trail to Mt. Shasta, at an elevation of about 4500 feet. Here the plants were growing on rather dry slopes, but differed from 7967 in no respect except in less spreading growth.

RIBES DIVARICATUM Dougl. Trans. Hort. Soc. **7**: 515. 1830.

No. 8042, collected June 15, in wet ground at the foot of the first ridge west of Sisson, Siskiyou county, with the fruit well formed but still green. It is rather common about Sisson in moist places.

RIBES WILSONIANUM Greene, Erythea, **3**: 70. 1895.

No. 7707, collected April 18, near Girard station in the Tehachapi mountains, Kern county. With the exception that the ovary is decidedly villous instead of "scarcely villous," the specimens agree very well with the description of this species. The berries are probably red when ripe, about 1 cm. long and nearly as broad, but the numerous red bristles 5 mm. long, with which they are armed, give them a larger appearance. These bristles have a pustulate base with short spreading hairs. The body of the berry appears glabrous to the naked eye, but is somewhat pubescent. "Mountains of Kern Co.," is the only record for it, but Professor Greene informs me that it was probably obtained somewhere between Caliente and Tehachapi. It was not seen at any point below Girard, elevation 3300 feet, but was noticed between there and Tehachapi, so these specimens are probably from near type locality.

RIBES QUERCETORUM Greene, Bull. Cal. Acad. **1**: 83. 1885.

No. 7708, collected April 18, on hills at Girard station in the Tehachapi mountains, Kern county. Here the bushes grew as described, "in dense, well rounded clumps," the ends of the branches gracefully curved out and down. The berries, well grown and beginning to color, were about 5 mm. in diameter. It was noticed both above and below Girard, occurring as low as Keene station.

No. 7792a, collected April 28, on the high ridge west of McKittrick, Kern county. It grew on the steep slope well up toward the crest in dense thickets of considerable extent, the branches merely spreading, with little or no tendency to curve. The type came from Paso Robles, San Luis Obispo county.

Ribes glanduliferum

A stout compact shrub about 5 feet high, growing in thick clumps, the ends of the branches somewhat drooping: old bark gray, somewhat flaky, growing parts yellowish, pubescent and glandular: without prickles; the sharp thorns solitary, rather slender, yellowish, about 8 mm. long: leaves somewhat variable in size, the largest about 2.5 cm. long including the very slender petiole which equals the blade; the blade broader than long, 3-5 parted, the divisions cuneate, slightly 3-lobed or almost entire, blunt; both petiole and blade pubescent with short hairs as well as glandular: the flowers single or in pairs, the calyx apparently white or creamy, cylindrical, 4 mm. long, 2 mm. wide, strongly pubescent with somewhat tangled hairs, the oblong obtuse lobes a little longer than the tube: petals white or perhaps pinkish, quadrate-oblong, merely a little rounded at the apex, 1 mm. shorter than the calyx: filaments subulate; anthers oblong, barely 1 mm. long, equal with the petals or extending slightly beyond them: pistil stout, 2 mm. long, style entire, the stigmatose end apparently narrowed: ovary densely glandular with long-stalked glands; berry about 7 mm. in diameter, glandular with long-stalked glands as well as sparingly pubescent with short hairs.

The type is no. 8005, collected June 9, 1905, on the hills near the railroad at Yreka, Siskiyou county, California. It was supposed to be *R. velutinum* Greene, the type of which came from that region, but a little examination showed that it is something very different. The flower characters are about the same, but there is a wide difference in the fruit, that of *velutinum* being hardly half the size, velvety pubescent and not glandular. Judging from the meager description of *R. brachyanthum* in Bot. Cal. 1: 205, it is a near relative of that species; but that is described as having the calyx "campanulate or barely cylindrical," and the internal structure of the flower is not mentioned. It is said to be confined to the Great Basin.

Our specimens were collected with practically full formed but uncolored fruit bearing the persistent flower, from which the above description was drawn.

ROSACEAE

OPULASTER CAPITATUS (Pursh) Kuntze, Rev. Gen. Pl. 949.
1891.

Spiraea capitata Pursh, Fl. Am. Sept. 1: 342. 1814.

No. 8057, collected June 17, on the banks of the upper Sacramento west of Sisson. Unlike some of the other species of the genus, this shrub always occurs near water or in moist places. The type was obtained by Menzies "on the north-west coast."

SPIRAEA DOUGLASII Hook. Fl. Bor. Am. 1: 172. 1830.

No. 8085, collected 22, near Igerna, Siskiyou county, in low moist places. It is a low shrub three or four feet high, the leaves much less whitened than in the typical form. Rather common from Sisson north to Edgewood.

RUBACER PARVIFLORUM (Nutt.) Rydb. Bull. Torr. Club, 30:
274. 1903.

Rubus parviflorus Nutt. Gen. 1: 308. 1818.

Rubus Nutkanus Moc. in DC. Prod. 2: 566. 1825.

No. 7949, collected June 1, on the Sacramento opposite Upper Soda Spring, Siskiyou county. The leaves are pubescent, but are thin, with longish acute divisions and irregular teeth, as in this species. Common in the canyon of the Sacramento in damp places. Type locality, "on the island of Michilimackinac, lake Huron."

POTENTILLA GRACILIS Dougl.; Hook. Bot. Mag. pl. 2984. 1830.

No. 8092, collected June 22, in a meadow near Igerna, Siskiyou county. These specimens are by no means slender, but they match others named *gracilis*.

POTENTILLA MILLEFOLIA Rydb. Bull. Torr. Club, 23: 433. pl.
277. f. 1-5. 1896.

No. 8074, collected June 20 at Gazelle, Siskiyou county, in a moist place in a field just north of the station. Mrs. Brandegee found it at Edgewood, July 1, 1887, the first station south of Gazelle. The type was collected in 1875 by Lemmon, no 86, probably somewhere in Sierra county.

DRYMOCALLIS GLANDULOSA (Lindl.) Rydb. Mem. Dept. Bot. Columb. Univ. **2**: 198. 1898.

Potentilla glandulosa Lindl. Bot Reg. **19**: *pl.* 1583. 1833.

No. 7904, collected May 30, in a meadow about two miles northeast of Redding, Shasta county. It was not very plentiful, nor was it noticed elsewhere in the vicinity. Douglas obtained the type somewhere in the coast region, probably about Monterey, where it is not uncommon.

HORKELIA PSEUDOCAPITATA Rydb.; Howell, Fl. N. W. Am. **180**. 1898.

No. 8055, collected June 17, in sandy soil between Sisson and Barnard station, Siskiyou county. It was not plentiful there, and is evidently rare, there being only one specimen of it in the herbarium of the California Academy, collected at Janesville, Lassen county, by T. S. Brandegee, June 28, 1892.

HORKELIA TRIDENTATA Torr. Pac. R. R. Rep. **4**: 84. *pl.* 6. 1857.

Ivesia tridentata A. Gray, Proc. Am. Acad. **7**: 338. 1868.

Horkelia Tilingi Regel, Act. Hort. Pet. **1**: 153.

Potentilla Tilingi Greene, Pittonia, **1**: 105. 1887.

No 7940, collected June 1, near Shasta Retreat, Siskiyou county, in rather rich sandy soil near trees. These specimens have longer and narrower leaflets and longer and more naked stems than the typical form, but it is a species somewhat variable as to foliage and growth. The type came from "wet ravines, Duffield's Ranch [near Auburn, Nevada county], Sierra Nevada; May 10; and hill-sides, Mammoth Grove, California; May 15." It is plentiful about Donner Lake, on the east side of the Sierra, elevation 6000 feet.

MALACEAE

AMELANCHIER PALLIDA Greene, Fl. Fran. 53. 1891.

No. 8003, collected June 9, at type locality, on the hills just east of Yreka, Siskiyou county, with well formed fruit.

No mention is made of pubescence in this species, but it is pubescent throughout, the leaves not noticeably so to the naked eye.

Amelanchier gracilis

Shrub 5-8 feet high, with erect or ascending slender usually wand-like branches, glabrous except for some deciduous woolly hairs in the inflorescence: bark gray-brown, or purplish on the young branches: leaves obovate-oblong or inclined to the elliptic, 2-4 cm. long, 1.5-2.5 cm. wide, the largest on young shoots, coriaceous, entire or slightly serrate near the apex, which is either acutish, rounded or rarely truncate: racemes short, 2-5 cm. long, 6-flowered or less; pedicels stout, 3 or 4 mm. long, the lower rarely longer, ascending: calyx lobes triangular-lanceolate, sharp pointed, barely 2 mm. long, recurved in fruit, woolly pubescent, especially inside: petals not seen: ovary densely woolly: fruit immature but apparently nearly full size, globose, 4 mm. in diameter.

The type is no. 7970, collected June 5, 1905, along the Sacramento a short distance below Shasta Springs, Siskiyou county, California. It grew on a narrow bench not far from the water, among other shrubs, unshaded by trees, the ground dry on the surface.

It is a common custom to refer almost every *Amelanchier* in and west of the Rocky mountains to *A. alnifolia* Nutt., the type of which came from "ravines and on the elevated margins or small streams from Fort Mandan [North Dakota] to the Northern Andes." It is described as "smooth," which statement Professor Nelson corroborates in Bot. Gaz. 40: 66. 1905, where he says: "At maturity it is perfectly glabrous and is quite glabrous from the beginning upon the calyx lobes." Nuttall also says "leaves roundish, the upper part toothed." A careful study of this genus, especially in the field, with good flowering and fruiting specimens from the same shrub, would no doubt bring out several other species, and probably show that *A. alnifolia* does not occur in California, if indeed upon the Pacific coast.

AMYGDALACEAE

CERASUS PARVIFOLIA Greene, Proc. Biol. Soc. Wash. **18**: 59.
1905.

No. 7929, collected June 1, on the banks of the Sacramento opposite Upper Soda Spring, Siskiyou county, in young fruit, elevation about 2400 feet. It is a branching shrub 5 or 6 feet high, found at intervals along the river.

No. 8045, collected June 16 in flower, back of Sisson on the Mt. Shasta trail, elevation about 4500 feet. This is from type locality. It is common in that region, often forming extensive thickets to the exclusion of other shrubs. The petals are round-ovate, 3 mm. across.

PADUS DEMISSA (Nutt.) Roem. Syn. Monog. **3**: 87. 1847.

Cerasus demissa Nutt. T. & G. Fl. N. A. **1**: 411. 1840.

Prunus demissa Walp. Rep. **2**: 10. 1843.

Prunus Virginiana var. *demissa* Torr. U. S. Expl. Exped. **17**: 284. 1874.

No. 7965, collected June 5, in flower, just below Shasta Springs, Siskiyou county, on the Sacramento, growing near the water, but unshaded by trees. It occurred as a slender shrub with few branches. It differs a little from the original from "plains of the Oregon toward the sea, and at the mouth of the Wahlamet," in being finely serrulate with appressed teeth pointing forward, instead of "sharply serrulate with straight teeth," and quite glabrous, not "more or less pubescent beneath."

No. 8004, collected June 9, at Yreka, Siskiyou county, at the base of the hills east of the town, along an irrigating ditch. Here it was a tree about 30 feet high, with a trunk diameter of 6 or 8 inches. The leaves are mostly large, about three times the size of those in the ordinary form, abruptly and shortly pointed rather than acute, the base somewhat narrowed and frequently emarginate; but on the same branch may be seen small leaves of the ordinary size and shape.

FABACEAE

Lupinus benthami

Lupinus leptophyllus Benth. Trans. Hort. Soc. II. **1**: 409. 1835; not Cham. & Schlecht. Linnaea, **5**: 589. 1830.

No. 7631, collected April 8, on the bluffs opposite Oil City near Bakersfield, Kern county. This is a handsome species, common on and near the foothills east of Bakersfield, growing in open gravelly places. It does not form such dense colonies as some of the other annuals, occurring rather as individuals.

LUPINUS MICRANTHUS Dougl.; Lindl. Bot. Reg. **15**: *pl.* 1251. 1829.

No. 7574, collected March 22, near the summit of the ridge east of South Butte, Marysville Buttes, Sutter county. It was plentiful in grassy places near oak trees, almost past flowering with well formed pods at this early date. The type was collected by Douglas on the Columbia river.

No. 7922, collected April 7, in a field east of Caliente, Kern county, in adobe soil. It was not plentiful, occurring in a limited area only.

No. 7836, collected May 5, at Tehachapi, Kern county, where it is not uncommon on grassy slopes. This species has a wide geographical as well as considerable altitudinal range. At Tehachapi it occurred at 4000 feet, and at about 1000 feet elevation at the other stations.

LUPINUS POLYCARPUS Greene, Pittonia, **1**: 171. 1888.

No. 7560, collected March 21, at Marysville, Sutter county, where it is not uncommon on the levees. Some of the less robust plants had narrower leaflets and were more pubescent than those only a few feet away which were more robust. It is a small flowered homely species, the herbage grey-green.

LUPINUS PACHYLOBUS Greene, Pittonia, **1**: 65. 1887.

No. 7568, collected March 22, in rich soil near Sutter City, Sutter county. This is not typical *pachylobus*, but is nearer it

than to any other described species. The banner has the edges turned back, approaching each other only at the top but not meeting, standing widely apart at the base. The keel is glabrous, rather strongly curved. The type is from the "Briones Hills, east of San Pablo Creek, Contra Costa County, California."

Lupinus persistens

Annual, about 3 dm. high, branched from the base, the branches usually decumbent at base, then erect, yellowish, pubescent with short ascending or appressed hairs, sparingly leafy: stipules subulate, about 3 mm. long, pubescent, especially the tips: petioles very slender about 3 cm. long, the uppermost scarcely reduced; leaflets about 6, linear, 2 cm. long, 2-3 mm. wide, the apex merely acutish, the base a little narrowed, pubescent with appressed hairs, the bright green upper side less so than the pale under side: peduncle 5 or 6 cm. long, extending well beyond the leaves; inflorescence 6 or 7 cm. long: flowers violet-blue in whorls of about 6: pedicels slender, 5 mm. long, pubescent: calyx densely pubescent with short hairs, the lower lobe 4 mm. long, ovate-lanceolate, entire, acute; upper lobe little more than 2 mm. long, cleft nearly to the base, the divisions parallel and 1 mm. apart except at the apex, where they are slightly curved toward each other: corollas 7 or 8 mm. long; banner with the edges turned back, meeting only near the apex, open cornucopia-like when viewed from behind, only a little hole 1 mm. across showing at the apex, the open base 6 mm. across, the face marked with a spot 3 mm. long, 4 mm. wide, at first pale pink with several dark dots at the base, later turning to dull rose; wings shorter than the banner by about 2 mm., broadly inflated, 4 mm. wide at base, and nearly that much at apex, the edges meeting all around except the space covered by the lower calyx lobe, the upper edges closely pressed against the face of the banner, except a space 2 mm. long from the apex down, the apex with a very short slightly incurved point; keel

strongly curved, bearded on the upper half, 2 mm. wide across the middle, narrowed at apex and base, the former acuminate: pods 2 cm. long or less, 4 mm. wide, tipped with the persistent curved-hooked style, pubescent with short hairs, 3-5 seeded, the seeds pale, unmarked.

The type is no. 7850. collected May 25, 1905, in open grassy places near the railroad just above Redding, Shasta county, California. It is not uncommon in similar situations in the gorge of the upper Sacramento as far north as Castella. The withered corollas remain affixed for a time at least to the pods, which fact suggested the name.

It is one of the forms which passes as *L. bicolor*, but that species, originally from the lower Columbia river, may not occur in California. Our plant differs from it in that it is not "silky with long hairs," has more numerous and smaller flowers, the wings are shorter instead of longer than the banner, the keel more pubescent, the pods not "somewhat falcate" nor "many seeded," and the seeds unmarked.

No. 7555, collected March 21, near Marysville, Sutter county, along the levee of Yuba river, where it was plentiful at intervals, growing in thick masses. The flowers are a trifle larger than those of the type, the plant more leafy, and the hairs longer, but it is referred here for the present.

LUPINUS NANUS Dougl.; Benth. Trans. Hort. Soc. II. 1: 409.
pl. 14. f. 2. 1835.

No. 7588, collected April 5, on plains at Oil City near Bakersfield, Kern county, growing in sandy soil. It is common on the plains east of Bakersfield, often forming great masses of color. This is not typical *nanus*, the leaves being narrower and the flowers smaller. The type of *nanus* was grown from seed sent from Monterey by Douglas, and the typical plant is still very abundant there.

LUPINUS POLYPHYLLUS Lindl. Bot Reg. **13**: pl. 1096. 1827.

No. 8093, collected in meadows near Igerna, Siskiyou county, June 22. It is common from Sisson north to Edgewood, always growing among grasses, and is one of our handsomest species, the large flowers varying from pinkish to violet, the inflorescence commonly over a foot in length. The type no doubt came from the lower Columbia river. It was "discovered by Mr. David Douglas in the north-west of North America."

Lupinus viridifolius

Perennial: stems herbaceous, several from a tough woody caudex, purplish, glabrous below, puberulent or shortly appressed pubescent above, leafy, branched above: lower leaves scattered, on slender petioles about 7 cm. long; the upper ones more numerous, the petioles shorter; leaflets commonly 7, oblanceolate, 3 cm. long, 1 cm. wide, rounded and shortly apiculate at apex, narrowed to the acute base, bright yellow-green and glabrous above, paler with short scattered appressed hairs below: peduncles 6 or 7 cm. long, not surpassing the leaves: inflorescence 1 dm. long, lax below: flowers more or less whorled, pale violet-blue, 8 or 9 mm. long and as broad: pedicels slender, 3 mm. long, densely pubescent with short hairs, as is the calyx: calyx lobes short, ovate, acute, the lower 3 mm. long, entire, the upper 2 mm. long, slightly 2-toothed: banner with edges merely turned back and parallel except at the base where they are slightly bent in, the apex inside the concavity with a prominent sharp point, the concavity 4 mm. across, face with several dark oblong spots; wings forming a short boat-shaped body open from base nearly to apex below but not flaring, the edges well down against the keel, the upper edges also open by a slit, presenting a slightly rounded surface 4 mm. across; distance between apices of wings and banner 4 mm.; keel strongly curved, the acuminate apex slightly protruding from the wings, densely bearded near the base, 3 mm. wide across the middle.

The type is no. 7928, collected June 1, 1905, on wooded slopes in rich soil at Dunsmuir, Siskiyou county, California. It is common in the gorge of the Sacramento from Dunsmuir to Shasta Springs. It is a relative of *L. latifolius*, but is a smaller plant, with lighter foliage and smaller flowers.

Lupinus violaceus

Perennial, rootstocks rather slender: stems herbaceous, decumbent at base, then ascending, 3 dm. long or less, silky with white appressed hairs, especially below, leafy: stipules setaceous, 5 mm. long: petioles about 6 cm. long; leaflets of the larger leaves commonly 9, oblanceolate, 3 cm. long, 1 cm. wide, the apex rounded and apiculate, the upper side dark green with few appressed hairs, the lower more densely hairy, whitened, margins ciliate: peduncles 6 or 7 cm. long but not extending beyond the leaves: inflorescence 1 dm. long or less: flowers deep violet-blue, 8 or 9 mm. long, 6 mm. across: pedicels ascending, 5 mm. long, densely and shortly appressed pubescent, as is the calyx; this with unequal lobes, the lower one lanceolate, 4 mm. long, entire, the upper ovate, barely 3 mm. long, shortly 3-toothed: banner a little longer than the wings, the edges turned back and parallel, forming a deep boat-shaped concavity 4 mm. across; wings open for a short distance along the lower edges exposing the keel but pressed close against it, the upper edges ending in a rounded ridge which for three-fourths of its length is pressed against the face of the banner; keel strongly curved, almost 3 mm. wide throughout except just below the acute apex, lightly bearded on the upper half.

The type is no. 8037, collected June 15, 1905, on the first ridge west of Sisson, Siskiyou county, California, at medium elevations in grassy places under pine trees, growing in thick mats, the stems not rising much above the ground. It probably belongs in the group with *L. onustus* and *L. parviflorus*, according to the arrangement in the Botany of California.

Lupinus purpurascens

Perennial, stout, about 7 dm. high, the stems herbaceous, leafy and with some short sterile secondary branches not exceeding the leaves, whitened with short, mostly appressed hairs: stipules setaceous, 5 mm. long: petioles rather stout, 5 cm. long, pubescent like the stems; leaflets, thick, commonly 7, oblanceolate, 6 cm. long or less, 1.5-2 cm. wide, the apex acute or acutish, the upper side light green, sparsely and shortly appressed pubescent, the under side more densely so, whitened: peduncle short, about 4 cm. long: inflorescence 2 dm. long, dense: flowers violet, large, whorled, 1.5 cm. long, 1 cm. across: pedicels stout, 7 mm. long, densely short hairy, as is the calyx, the lobes of which are entire, the lower one 1 cm. long, the upper 8 mm.: banner with the edges turned back and parallel, the apex ending in a short cusp, the face darker than the other parts, of a deep rich purple; wings obliquely obovate, exposing the keel; this strongly curved, pale, densely bearded on the lower half, the slender acuminate apex slightly protruding.

The type is no. 7847, collected May 25, 1905, on banks near the railroad just above Redding, Shasta county, California. It occurs at intervals along the upper Sacramento, perhaps as far north as Castella. It is a relative of *L. albicaulis*.

LUPINUS ALBICAULIS Dougl.; Hook. Fl. Bor. Am. **1**: 165. 1833.

No. 8101, collected July 14, near Nevada City, Nevada county, along the electric railroad in a field. This is apparently the plant which passes in California under the above name, but the writer did not see it in the northern part of the State, where it should be found. Watson, in the Botany of California came nearer to an accurate description of the flower than any other writer when he says: "the standard naked, acute with the margins coherent near the apex." In our specimens they are more nearly coherent at the base, above that parallel, the pointed apex curved back. When fresh the flowers are pale violet-purple with a darker spot on the face of the banner, but turn tawny in drying.

Lupinus shastensis

Perennial: stems herbaceous, tall, about 10 dm. high, much branched above, purplish, glabrous below, the growing parts puberulent or shortly pubescent: stipules setaceous, 4 mm. long, shortly pubescent: petioles 3-4 cm. long, puberulent; leaflets 7-9, oblong-oblongate, 4 cm. long or less, 8 mm. wide, the apex acutish, apiculate, the base acute, bright green and shortly pubescent on both sides, the midvein prominent beneath: peduncles of varying length, 1.5 dm. or less: inflorescence 1-3 dm. long: flowers whorled, 1 cm. long, 8 mm. across the middle, 6 mm. between the apices of banner and wings: pedicels slender, 3-5 mm. long, shortly pubescent: calyx 7 mm. long, the lobes about equal, densely short hairy, the lower acutish, entire, the upper with the blunt apex slightly notched: banner tawny, the edges turned back, in the lower half curved over and almost meeting, in the upper half nearly parallel, the apex curved back ending in a sharp point 1 mm. or more in length; wings white, inflated and boat-shaped the oblique lower edges exposing the keel, the ventral side forming a plane 4 mm. wide, the edges with a slit 1 mm. wide between them: keel strongly curved, glabrous, 3 mm. wide at base, 4 mm. at the middle, then narrowed into a slender acuminate yellowish point, which protrudes slightly beyond the wings.

The type is no. 8024, collected June 13, 1905, on the banks of the Sacramento a short distance above Shasta Springs, Siskiyou county, California. It is plentiful on the plateau between Shasta Springs and Sisson, and was noticed along the railroad as far south as Castella. It approaches *L. albicaulis* in the shape of its flowers, and Mr. Congdon has sent it out under that name, the specimen from somewhere near Sisson.

Lupinus proximus

Perennial: stems herbaceous, several or many from a heavy rootstock, erect, 6 dm. high, leafy, pubescent with short appressed or ascending hairs: stipules setaceous, 6 or 7 mm. long: pet-

ioles 4-6 cm. long, channeled, pubescent like the stem: leaflets 7-9, oblong-spatulate, 3-4 cm. long, the apex rounded or acutish, shortly mucronate, equally pubescent on both sides with appressed hairs: peduncle rather short and stout, 7 or 8 cm. long: inflorescence about 2 dm. long: bracts setaceous, deciduous, 6mm. long: pubescent pedicels 5 mm. long: flowers pale violet-blue, indistinctly whorled, about 13 mm. long, 10 or 11 mm. wide: calyx 8mm. long, densely appressed pubescent, both lobes strongly convex, lanceolate, each about 3 mm. wide at base, the upper a trifle shorter than the lower, rounded dorsally, shortly 2-toothed; lower lobe with a sharp keel-like ridge, almost acuminate, entire: banner with edges turned back but not meeting, the space between 2 or 3 mm. wide, this concavity with a prominent ridge along the bottom ending in a mucro at the apex; the sides pale violet with darker edges, the face yellowish, dotted with small purple spots; wings open along the lower edge to within 3 mm. of the apex, exposing the keel, which protrudes 2 mm., the upper edges meeting or merely showing a narrow slit; keel strongly curved, glabrous, the inner edges hyaline, about 4 mm. wide to a little above the middle, then gradually narrowed to the pointed apex.

The type is no. 7814, collected April 18, 1905, at Girard Station in the Tehachapi mountains, Kern county, California, and is not uncommon in that region. It is related to *L. formosus*, which has been found only in the San Francisco Bay region.

LUPINUS MINIMUS Dougl.; Hook. Fl. Bor. Am. 1: 163. 1833.

No. 7933, collected June 1, near Shasta Retreat, Siskiyou county. The plant is common along the upper Sacramento at least as far south as Castella, and is also found about Sisson and elsewhere near the foot of Mt. Shasta. It is a strikingly handsome species, often growing in masses in gravelly or sandy soil.

Lupinus austromontanus

Perennial: stems from a heavy tough rootstock, multicapital, 4 dm. high, naked or nearly so, silvery as well as the leaves and petioles with a dense close pubescence: leaves basal or an occasional one on the stem, the petioles 1 dm. long; leaflets 7-9, oblanceolate or spatulate, 3-4 cm. long, 6-10 mm. wide, the apex rounded and shortly mucronate: inflorescence occupying the upper half of the stem: flowers violet-purple, whorled, the lower internode 4 cm. long, the others gradually shorter: bracts deciduous, setaceous, 8 mm. long: pedicels 5mm. long, rather stout, whitened as is the calyx with dense short hairs: calyx 1 cm. long, the lobes nearly equal, the lower lance-oblong, less than 3 mm. wide at base, gradually narrowed to the acutish 3-toothed apex, the teeth 1 mm. long; upper lip 4 mm. wide at the rounded slightly processed base, cleft nearly to the middle, the teeth short-acuminate: banner turned back, the edges almost meeting except at apex and base; the face yellow; wings inflated, about 7 mm. across, the edges meeting throughout, presenting a slight sharp ridge; keel moderately curved, 3 mm. wide across the middle, narrowed at apex and base, slightly bearded just below the apex.

The type is no. 7825, collected May 5, 1905, at Tehachapi, Kern county, California. It is plentiful in fields near the town, and is a very handsome species, the silvery herbage and large bright flowers making it unusually attractive. It does not seem to be closely related to any Californian species, approaching in habit but in nothing else, such species as *L. minimus*.

Lupinus corymbosus

Perennial, about 6 dm. high, woody below, corymbosely much branched above, the branches pale or purplish, seemingly glabrous to the naked eye, but pubescent with short appressed hairs, leafy: stipules setaceous, 4 mm. long: petioles pubescent like the stems, 2.5-3 cm. long; leaflets light green, about 9, linear-oblong, 3 cm. long, 2-3 mm. wide, acute and shortly cuspid-

date, glabrous or nearly so above, pubescent beneath with short closely appressed hairs, midvein prominent: peduncles short, 2 or 3 cm. long: inflorescence 1 dm. long, the flowers lax, scattered or sometimes indistinctly whorled, pale violet-purple, 1 cm. long, 8 mm. wide: pedicels slender, shortly pubescent, 5 mm. long: calyx pubescent as the pedicels, shortly and bluntly spurred, the lobes nearly equal, entire, the lower 5 mm. the upper 4 mm. long: banner with edges turned back and parallel, midvein ending in a short sharp point which does not protrude from the concavity; wings inflated, cohering only at the apex, the lower edges standing apart exposing the keel, the upper slightly gaping, the surface plane, 4 mm. across; keel with a strong rectangular curve, glabrous, over 2 mm. wide to a point slightly beyond the curve, then gradually tapering to an acuminate point.

The type is no 8015, collected June 9, 1905, at Montague, Siskiyou county, California, where it is plentiful on the plain near the town. It is a symmetrically branched plant, apparently not closely related to any of the shrubby Californian species, the rather small flowers with the apices of wings and banner only about 2 mm. apart.

LUPINUS ALBIFRONS Benth. Trans. Hort. Soc. II. 1: 410. 1835.

No. 7577, collected March 22, on the ridge east of South Butte, Marysville Buttes, Sutter county, where it is common at medium elevations. A shrub about three feet high, with large flowers either deep or light violet-purple, the banner with some yellow on the face, the edges turned back and almost meeting at the middle, about 4 mm. apart at the base, 2 mm. at the apex. The wings wholly include the keel.

No. 7849, collected May 25, near the railroad just above Redding, Shasta county. This has leaves greener, a little more pointed, the flowers smaller, with the banner turning dull purple when dry. This species, as commonly interpreted, is a shrub 3-5 feet high with pronounced trunk, much branched

above. The original description calls for "caulibus decumbentibus."

Lupinus odoratus

Annual, section *Platycarpus*, somewhat fleshy, 1.5-2.5 dm. high: leaves basal; petioles 8 cm. long or less, stout, 3-nerved at the enlarged base, somewhat villous with white hairs; leaflets commonly 9, oblanceolate, 2 cm. long or less, 7mm. wide below the rounded but acutish apex, bright green, at first decidedly villous but becoming glabrous except for the few tufts of hairs at the apex and near it: scape-like peduncle yellowish, equaling or exceeding the leaves: inflorescence 5 or 6 cm. long: narrowly linear-lanceolate persistent bracts 2 or 3 mm. long, with a tuft of long hairs at the apex: pedicels slender, 6 mm. long, ascending, glabrous, readily disarticulating from the stem: flowers not whorled, pleasantly scented, deep violet purple except for a yellow oblong spot on the face of the banner, about 1 cm. long, 8 mm. across: calyx dull green, the lobes obtuse, the lower nearly 4 mm. long, sometimes slightly 3-toothed, the upper entire, 2 mm. long; a small bractlet 1 mm. long in the sinus between the lobes: banner broad (1 cm.), the edges only slightly turned back, presenting a scoop-like appearance viewed from the back; wings about 2 mm. shorter than the banner, inflated and open below, the opening ovate, nearly 3 mm. wide below, the upper edges closed or showing only a small slit; keel not protruding from the open wings, rather strongly curved, 3 mm. wide for about two-thirds its length, then tapering to the acute apex; glabrous, narrowly hyaline margined almost throughout: pods yellowish, oblong, 1 cm. long, 6 mm. wide, oblique at either end, the ventral margin with a fringe of long hairs, the seeds grey, wrinkled, about 2 mm. in diameter, one of them often abortive.

The type is no. 7673, collected April 13, 1905, at Kramer, San Bernardino county, California, on the Mojave desert: the pods and seeds described from a specimen collected at the same

place by Mrs. Brandegee, May 16. This is an interesting plant, combining somewhat the characters of *Lupinus* proper and the section *Platycarpus*. The writer had no idea that it belonged to the latter section when he collected it. Strangely enough, it has been referred to *L. brevicaulis*, a specimen collected at Lancaster, Los Angeles county, by A. D. E. Elmer being so labeled, as is one by Mr. H. M. Hall from Barstow, May, 1905, no. 6166. Mr. Parish also collected it on the Mojave desert, outside of which it has thus far not been detected. It is related to *L. brevicaulis* only in a superficial way, being a much larger plant not nearly so pubescent, the glabrous calyx of a different shape, and the flowers much larger, apparently of a different shape.

Lupinus desertorum

Annual, section *Platycarpus*? the stems prostrate, 1 dm. long or less, pale, pubescent with short ascending hairs, leafy, the leaves scattered, exceeding the inflorescence; petioles 5 cm. long or less, pubescent like the stem; leaflets 7-9, oblong-oblancoolate, 1.5 cm. long, 3-4 mm. wide, the apex acutish, the hairs more numerous and longer than on the stems: stipules linear, 3 mm. long, densely hairy: peduncle none or very short, rarely more than 5 mm. inflorescence 1-2 cm. long: bracts lanceolate, 3 mm. long, villous: pedicels 2 mm. long or less, also densely villous, as is the calyx, the lower lobe 3 mm. long, 3-toothed, the upper 2 mm. long, cleft almost to the base: flowers not whorled, pale, 6 mm. long, 4 mm. across; banner tinged with yellow, the edges turned back and parallel, the concavity shallow; wings moderately inflated, purplish or pinkish tinged, the edges meeting throughout, on the upper side next the banner raised into a sharp ridge with a shallow depression on either side; keel glabrous, curved only near the end, broad, almost 2 mm. wide throughout, narrowed a little at the thick but acutish purplish apex: pods immature, villous, oblong? 1 cm. or a little more in length.

The type is no. 7679, collected April 14, 1905, on gravelly hillsides at Randsburg, Kern county, in the Mojave desert. Its position is somewhat uncertain, as some of the immature pods appear to be ovate, perhaps due to pressure, while others are more like those of ordinary *Lupinus*. Purpus' 5802, from "sandy plains, Deep Springs Valley, Calif." labeled *L. pusillus* Pursh, is apparently the same, but true *pusillus* is a very different plant, and should not be expected in California.

Lupinus ruber

Annual, section *Platycarpus*: about 1 dm. high, villous throughout except on the upper side of the leaves, branched from the base, the branches diffuse: petioles 8 cm. long or less, broad and membranous 3-nerved near the base; stipules linear, 6 or 7 mm. long, decurrent or adnate to the petiole for 1 cm. on large leaves: leaflets blue-green, oblanceolate or spatulate, the largest 2 cm. long, 8 mm. wide, smooth above, the apex rounded and obtuse: peduncles about 2 cm. long, the inflorescence little if any longer: flowers erect in from 2 to 4 whorls, as long or a little longer than the internodes, dull red, 1 cm. long, about 4 mm. across: bracts lance-acuminate, 8 mm. long, little more than 1 mm wide at base: lower calyx lobe 8 mm. long, barely 3 mm. wide at the base, the apex cleft for 2 mm, with a short cusp in the sinus; upper lip practically obsolete, represented by two short lanceolate teeth of 1 mm: banner almost plane, ovate-lanceolate, 4 mm. wide at base, slightly keeled; wings narrow, 2mm. wide, the lower edges not meeting until near the apex: keel not strongly curved, barely 2 mm. wide at the middle, bearded only near the slightly narrowed base: immature pods obliquely ovate, about 17 mm. long, 1 cm. wide, villous.

The type is no. 7827, collected May 5, 1905, at Tehachapi, Kern county, California, along the railroad a short distance west of the town. It is a species remarkable for its small narrow red flowers. Some of the specimens show only a short central flowering branch much shorter than the leaves, while others have in

addition lateral branches about equalling the leaves. It is a relative of *L. brevicaulis*, but that has "deep blue" flowers, the parts all but the keel differing in shape, and that is glabrous, while in ours it is bearded near the base.

Lupinus horizontalis

Annual, section *Platycarpus*: diffuse, large plants about 12 cm. high, 2 dm. across: herbage pubescent with short spreading hairs, or more nearly villous above on calyx, bracts, etc.: branches several, all floriferous, more or less dichotomous, the lowest ones horizontal, the ones above them more ascending, the middle ones erect: petioles variable, the longest about 6 cm., rather stout, wider at the base; stipules narrowly lance-linear, 2 mm. long, adnate for 5 mm. or less; leaflets 7-9, oblanceolate, 1.5 cm. long, 5 or 6 mm. wide, rounded and obtuse: peduncles and inflorescence of varying length, the whole usually equalling or a little exceeding the leaves: membranous bracts about 3 mm. long, acuminate from a triangular base nearly 2 mm. wide: pedicels short, barely 2 mm. long: lower lobe of the calyx green, pubescent with somewhat tangled hairs, ovate-lanceolate, 6 mm. long, over 3 mm. wide at base, barely acutish, the apex minutely 2-toothed; upper lip ovate, membranous, barely 2 mm. long, cleft nearly to the base, the lobes lanceolate with rather wide sinus, villous and ciliate: flowers pale violet-blue, whorled and crowded, eqalling or exceeding the internodes, erect, 1 cm. long, 7 mm. across; banner plane or only slightly turned back, with a prominent midvein; wings joined only near the apex, the opening narrowly elliptical, 2 mm. wide, slightly exposing the keel, this not much curved, ciliate on the lower third, 2 mm. wide for three fourths the length, then gradually narrowed to the sharp apex which protrudes a little from the wings: pods obliquely ovate, acute, 12 mm. long, 6 mm. wide, somewhat pubescent with long tangled hairs: seeds nearly 3 mm. across, marked with small dark spots.

The type is no. 7725, collected April 20, 1905, at Sunset, Kern county, California, on dry gravelly hillsides. It is a peculiar species, a true *Platycarpus*, but not closely related to any hitherto described. The lower horizontal branches are prostrate, resting on the ground. The dense flower spikes resemble somewhat those of *L. luteolus*, but are much shorter.

Lupinus arenicola

Annual, section *Platycarpus*: 1 dm. high, and somewhat broader, villous throughout the flowers excepted: branches several, ascending, commonly only the middle one floriferous: petioles 6 cm. long or less, about 2 mm. wide at the base, narrower above; stipules lance-acuminate, 4 mm. long, 1 mm. wide at base, adnate for at least 5 mm.; leaflets normally 9, spatulate, 2 mm. long, 7 mm. wide: bracts lanceolate, acuminate, 5 mm. long: pedicels very short, hardly 2 mm. long: flowers in 1 to 3 whorls, merely ascending whitish or rose color, 1.5 cm. long, the internodes as long or longer than the flowers: calyx with broad acutish lower lip 7 mm. long, 5 mm. wide at base, the apex minutely 2-toothed; upper lip ovate, glabrous except along the margins, 3 mm. long and as wide at the base, the apex 2-toothed, the teeth 1 mm. long, bluntly lanceolate, slightly spreading: banner turned back, a triangular shaped opening 2 mm. wide between the edges at the apex, below that meeting for nearly 5 mm., then curved outward; wings widely inflated, the edges below forming a broad ellipse 8 mm. wide, 12 mm. long, united near the apex; the upper edges also with a space 2 mm. wide between; keel scarcely protruding from the open wings, little curved, ciliate on the lower half, 5 mm. wide for two-thirds its length, then gradually narrowed to an obtusish point 1 mm. wide: pods ovate, nearly 2 cm. long, 1 cm. wide, acuminate: seeds large, 4 mm. in diameter, white or whitish.

The type is no. 7609, collected April 7, 1905, near the first crossing of the creek west of Caliente, Kern county, California, growing in sandy soil on steep banks near the railroad. It also

occurs on the bluffs of Kern river above Bakersfield. The plant is somewhat fleshy, with a glaucescent appearance when fresh. It has larger flowers than any other species in this section.

LUPINUS DENSIFLORUS Benth. Trans. Hort. Soc. II. 1: 409.
1835.

No. 7798, collected May 1, at Keene Station in the Tehachapi mountains, Kern county. It is common at intervals along the railroad between Caliente and Keene, is about a foot and a half high, the flowers white tinged with pink. The type was grown from seed sent from Monterey by Douglas.

No. 6538, collected April 10, on plains near Oil City, opposite Bakersfield, Kern county. This is a lower, more slender plant than 7798, with rose colored flowers, but does not differ essentially in flower characters. It was also noticed on the bluffs of Kern river above Bakersfield.

LUPINUS LUTEOLUS Kellogg, Proc. Cal. Acad. 5: 38. 1873.

No. 7951, collected June 3, in sand along the Sacramento between Middle Creek Station and Keswick, Shasta county, the flowers pale yellow as in the type. The plants were mostly large, nearly two feet high and wider than that across the top, the branches almost horizontal, giving the plant a tree-like appearance. In Flora Franciscana Greene gives *L. bridgesii* A. Gray as a synonym of this, but it should rather be referred to *L. menziesii* Agardh, provided it is not distinct.

No. 7990, collected June 8, on low hills west of Yreka, Siskiyou county. Here the plants were not so tall as those of no. 7951, the branches more ascending and the flower bright yellow, but the essential characters in no wise different.

TRIFOLIUM COLUMBINUM Greene, Pittonia, 1: 4. 1887.

No. 7578, collected March 22, on the ridge east of South Butte, Marysville Buttes, Sutter county, where it is not uncommon, ascending to an elevation of at least 800 feet. It appears to be confined to the region north of the Bay of San Francisco, the type from Vacaville, Solano county, on the west side of the Sacramento valley.

TRIFOLIUM NEOLAGOPUS Loja. Nuovo Giorn. Bot. Ital. 15: 194. 1883.

No. 7626, collected April 7, in fields a short distance east of Caliente, Kern county. This is a slender erect form, the leaves deep green above, a little paler beneath. This species has commonly passed as *T. albopurpureum*, which Dr. Small informs me is hardly distinct from *T. macraei*. The type of *T. neolagopus* was collected in San Luis Obispo county.

No. 7800, collected May 1, on the first ridge west of Keene Station in the Tehachapi mountains, Kern county, on grassy northerly slopes. This differs little from 7626 except in being more branched from the base, the peduncles a little shorter.

No. 7835, collected May 5, at Tehachapi, Kern county, on the hills north of the town. This form is lower than either of the two preceding and more pubescent, but appears to be the same. The elevation is 4000 feet.

TRIFOLIUM CILIOLATUM Benth. Pl. Hartw. 304. 1848.

Trifolium ciliatum Nutt. Journ. Acad. Phila. II. 1: 152. 1848; not Clark.

No. 7770, collected April 26, about a mile inside Kern canyon on steep gravelly slopes, the elevation about 1000 feet. Only a little of it was noticed. The stipules are perfectly glabrous, not "subciliate," as described by Nuttall, whose type came from the "Pueblo de los Angeles, Upper California." It is rather widely distributed, occurring as far north as the Columbia river, according to Watson.

TRIFOLIUM GRACILENTUM T. & G. Fl. N. A. 1: 316. 1838.

Trifolium denudatum Nutt. Journ. Acad. Phila. II. 1: 152.
pl. 24. 1848.

No. 7660, collected April 12, on the ridge to the right of the mouth of Kern canyon. These plants are low and slender, and were found sparingly on steep gravelly slopes, the elevation perhaps 1500 feet. The species has apparently not heretofore been reported from the foothills of the southern Sierra.

No. 7761, collected April 24, at the foot of the mountain about three miles southwest of Mojave, Kern county, on the Mojave desert. The plants were prostrate, growing in rounded mats in gravelly ground. The habitat is a rather unexpected one. A form similar to this occurs in the foothills of the Santa Cruz mountains about Los Gatos, Santa Clara county.

TRIFOLIUM SPINULOSUM Dougl.; Hook. Fl. Bor. Am. 1: 133.
1830.

No. 8094, collected June 22, in moist meadows near Igerna, Siskiyou county, where it was plentiful. The flowers are purple throughout, not "white; the carina and alae tipped with a fine purple." The leaves also are elliptical or oblanceolate rather than oblong. The type was from "in the vallies between Spokane and Kettle Falls," Washington.

No. 8102, collected July 14, near Nevada City, Nevada county, along the electric railroad growing in wet places. This is a stouter plant than 8094, is a duller green, with leaflets obtuse or merely acutish, the mucronate point absent or very short. It may be distinct.

TRIFOLIUM ACICULARE Nutt.; T. & G. Fl. N. A. 1: 319. 1838.

No. 7851, collected May 25, along the railroad a short distance above Redding, Shasta county. The species has never been recorded from so far north, but is common in the Bay region. The original came from "plains of St. Barbara." It

seems to differ from *tridentatum* principally in having the calyx tube uncolored, the teeth generally but not always entire. Both species have narrow linear, spinulose and apiculate leaflets.

TRIFOLIUM SCABRELLUM Greene, Pittonia, **1**: 159. 1888.

Trifolium tridentatum var. *scabrellum* Greene, Fl. Fran.
31. 1891.

No. 7621, collected April 7, in adobe soil in a field a short distance east of Caliente, Kern county. The plants were ascending rather than decumbent, and the comparatively broad leaflets somewhat variable in shape. The upper leaflets are inclined to be rounded instead of truncate. The type came from "moist grounds on the plains near Visalia, California, March, 1886, Dr. T. J. Patterson." Visalia is about 100 miles north of Caliente.

No. 7659, collected April 12, on the ridge on the north side of the mouth of Kern canyon. Here the plants were growing on comparatively dry slopes, are larger, and have calyx teeth greenish, not purple as in the type. The leaflets are prominently cusped, the narrower ones inclined to be acute.

TRIFOLIUM MELANANTHUM H. & A. Bot. Beech. 331. 1840.

Trifolium tridentatum var. *melananthum* S. Wats. Proc.
Am. Acad. **11**: 130. 1876.

Trifolium variegatum var. *melananthum* Greene, Fl. Fran.
29. 1891.

No. 7821, collected May 5, at Tehachapi, Kern county, on the edge of a small stream a short distance west of the town, the plants growing in a dense mass, the stems ascending. This may not be *melananthum*, but seems nearer it than to any other species.

No. 7841, collected May 15, in Los Gatos canyon above Alma, Santa Clara county in wet places along the road. The stems were long, procumbent, growing in tangled mats. Only the tips of the calyx lobes are purplish. The type was collected by Douglas while working from Monterey as a base.

TRIFOLIUM GEMINIFLORUM Greene, Pittonia, **3**: 216. 1897.?

No. 7892, collected May 29, in sand along the Sacramento at the bridge near Redding. This is perhaps the form which Greene mentions as growing at "decidedly lower than subalpine situations in Amador County * * with from 5 to 15 flowers to the head, and otherwise somewhat closely verging upon *T. variegatum*." The calyx is 20-nerved, while in the type of the species, which Lojaccono described from a specimen collected by Lemmon in the Yosemite, it is "10-nerviis (nervis aliquando copiosis)."

TRIFOLIUM VARIEGATUM Nutt.; T. & G. Fl. N. A. **1**: 317. 1838.

No. 7964, collected June 5, a short distance below Shasta Springs, Siskiyou county, where it is locally abundant, growing in dense mats, the stems low, branching from the base. The original was from "springy places near the mouth of the Wahlamet," and our plant answers fairly well to the description of it, but the description would equally fit almost any related plant.

Trifolium splendens Heller, Muhlenbergia, **1**: 115. 1905.

No. 6691, collected May 7, 1903, at Pacific Grove, Monterey county, in damp grassy places in the pine woods where it is abundant. It is even handsomer than *T. wormskjoldii* which is also plentiful there in certain places. *T. splendens* is local the writer never having seen it from any other place. It is near *T. appendiculatum* Loja., and perhaps may not be distinct. Lojaccono's excellent discription was not at hand when this was published.

TRIFOLIUM WATSONI Loja. Nuovo Giorn Bot. Ital. **15**: 186. 1883.

No. 7581, collected March 22, on the ridge east of South Butte, Marysville Buttes, where it is plentiful at medium elevations. This is not typical, as the calyx is uncolored, has more numerous veins, the lobes narrower, and the flowers white with

a purple eye on the banner. It is a very handsome plant when fresh, the flowers larger than in related species. The type was collected near Chico, Butte county, by Mrs. Bidwell.

TRIFOLIUM BARBIGERUM Torr. Pac. R. R. Rep. 4: 79. 1857.

No. 7842, collected May 15, in Los Gatos canyon above Alma, Santa Clara county, along the road in shaded places. It has slightly larger heads than usual. The type came from near San Francisco.

TRIFOLIUM DEPAUPERATUM Desv. Journ. Bot. 4: 69. *pl.* 32.
1814.

No. 7563, collected March 21, at Marysville, Sutter county, in low moist clayey ground, the plants prostrate, flowers purplish. The involucre is practically obsolete, being reduced to a narrow entire disc.

TRIFOLIUM TRUNCATUM Greene, Proc. Acad. Phila. 1895: 546.
1896.?

Trifolium Franciscanum var. *truncatum* Greene, Manual,
100. 1894.

No. 7564, collected March 21, at Marysville, Sutter county, in low moist clayey ground, the plant prostrate, the flowers whitish, the involucre with oblong, obtuse, slightly hyaline lobes.

TRIFOLIUM STENOPHYLLUM Nutt. Journ. Acad. Phila. II. 1:
151. 1848.

No. 7620, collected April 7, in a field in adobe soil a short distance east of Caliente, Kern county. If Nuttall's description of "stipules subulate" is correct, this plant must be something else, as they are ovate, the free part lance-acuminate. He also says the leaflets are linear, but in our plant they are mostly narrowly cuneate. Originally from "the island of Santa Catalina and San Pedro."

LOTUS AMERICANUS (Nutt.) Bisch. Litt. Ber. Linnaea, **14**: 132.
1840.

Trigonella americana Nutt. Gen. **2**: 120. 1818.

Lotus sericeus Pursh, Fl. Am. Sept. 489. 1814; not DC.
1813.

Hosackia Purshiana Benth. Bot. Reg. under *pl.* 1257. 1829.

No. 8001, collected June 8, on dry hills west of Yreka, Siskiyou county. This is a small form with erect branches from the base, the corolla small, 4 mm. long, about equaled by the calyx.

LOTUS WRANGELIANUS F. & M. Ind. Sem. Petrop. **2**: 42. 1835.

Hosackia Wrangeliana T. & G. Fl. N. A. **1**: 326. 1838.

Lotus subpinnatus var. *Wrangelianus* Jepson, Flora West.
Mid. Cal. 303. 1901.

No. 7554, collected March 21, in flower near Marysville, Sutter county, on the levee of Yuba river, where it is plentiful.

No. 7632, collected April 8, on the low open ground at the foot of China Grade near Kern, Kern county, mostly in the fruiting stage. It is widely distributed in the State, especially common in the coast region. The type was grown from seed sent from Bodega Bay, Sonoma county.

LOTUS HUMISTRATUS Greene, Pittonia, **2**: 139. 1890.

Hosackia brachycarpa Benth. Pl. Hartw. 306. 1849.

Lotus brachycarpus S. Wats. Bibl. Index, 225. 1878; not
Hochst. 1841.

No. 7848, collected May 25, on gravelly hills at Redding, Shasta county, where it is common. The type was collected by Hartweg "in montibus Sacramento." It is apparently common in the foothills on both sides of the Sacramento valley.

LOTUS NUDIFLORUS (Nutt.) Greene, Pittonia, **2**: 141. 1890.

Hosackia nudiflora Nutt.; T. & G. Fl. N. A. **1**: 326. 1838.

No. 7684, collected April 14, on gravelly hills at Randsburg, Kern county. This species, if the writer has it properly

placed, is readily distinguished from its near relative, *L. strigosus*, by its much smaller and paler flower. The plants were prostrate, growing in roundish mats.

No. 7820, collected May 1, just back of Keene Station in the Tehachapi mountains, Kern county, on low gravelly hills. The original was from "gravelly hills near Monterey."

LOTUS TORREYI (A. Gray) Greene, Pittonia, **2**: 146. 1890.

Hosackia Torreyi A. Gray, Proc. Am. Acad. **8**: 625. 1873.

No. 7980, collected June 5, on wet banks along the Sacramento near Shasta Springs, Siskiyou county, where it is plentiful. It is a rather showy plant, the banner yellow, the wings and keel white. The original was from the Yosemite. It has considerable altitudinal range, ascending to at least 6000 feet in the Sierra and north Coast Range.

LOTUS CRASSIFOLIUS (Benth.) Greene, Pittonia, **2**: 147. 1890.

Hosackia crassifolia Benth. Trans. Linn. Soc. **17**: 365. 1837.

Hosackia platycarpa Nutt.; T. & G. Fl. N. A. **1**: 323. 1838.

No. 7972, collected June 5, along the Sacramento a short distance below Shasta Springs, Siskiyou county, growing among shrubs in comparatively dry ground. It has a wide range in California, occurring in both the Coast Range and the Sierra, extending north into Washington. It ascends to at least 6000 feet.

LOTUS GLABER (Vogel) Greene, Pittonia, **2**: 148. 1890.

Syrmatium glabrum Vogel, Linnaea, **10**: 591. 1836.

Hosackia glabra Torr. U. S. Expl. Exped. **17**: 274. 1874.

No. 7624, collected April 7, on steep banks a short distance east of Caliente, Kern county. This did not look altogether like the form common in the Bay region, but apparently has no distinguishing characters.

LOTUS DOUGLASII Greene, Pittonia, 2: 149. 1890.

Hosackia decumbens Benth. Bot. Reg. under *pl.* 1257. 1829;
not *Lotus decumbens* Poir.

No. 8000, collected June 8, on dry hillsides west of Yreka, Siskiyou county. This species occurs as far south as Mt. Sanhedrin, Lake county, where the writer collected it in 1902. It had not previously been reported south of Humboldt county.

ASTRAGALUS FREMONTII A. Gray, Pac. R. R. Rep. 4: 80. 1857.

Astragalus lentiginosus var. *Fremontii* S. Wats. Bot. King Rep. 66. 1871.

No. 7587, collected April 5 near Oil City, opposite Bakersfield, Kern county, growing on open sandy plains, the plants prostrate. It is very common all through that region on the plains and hills, in many places so thick that the bladdery pods are crushed under foot at every step. Originally from "banks of the Rio Virgin," Nevada, collected by Fremont.

No. 7833, collected May 5, at Tehachapi, Kern county, where it is abundant in fields. This looks like a distinct plant, the stems more ascending, sparingly pubescent with short chaffy hairs, the calyx lobes with a broader base, the pods more pubescent than no. 7587.

ASTRAGALUS LENTIGINOSUS Dougl.; Hook. Fl. Bor. Am. 1:
151. 1830.

No. 8062, collected June 19 near Grenada Station, Siskiyou county, where it is plentiful along the railroad, the plants prostrate, forming mats often nearly two feet in diameter. The elevation is about 2700 feet. Originally collected by Douglas on "subalpine ranges of the Blue Mountains of North-west America."

ASTRAGALUS LAYNEAE Greene, Bull. Cal. Acad. **1**: 156. 1885.

Astragalus malacus var. *Layneae* Jones, Zoe, **4**: 29. 1893.

No. 7669, collected April 13, at Kramer, San Bernardino county, on the Mojave desert, where it is abundant, as it also is at Randsburg. Mrs. Curran first collected it in 1884 at Hinkley Station, 23 miles east of Kramer. Jones, in the place cited above, says: "In addition to the characters given, I find the flowers are purple, one half an inch long." Our specimens, which seem to be quite typical, have flowers three-fourths of an inch long, pale lilac with part of the banner darker.

Phaca leucoloba (Jones)

Astragalus leucolobus Jones, Zoe, **4**: 270. 1893.

No. 7712, collected April 18, at Girard Station, in the Tehachapi mountains, Kern county. It occurred sparingly on grassy hillsides. The type was collected by "S. B. Parish in Bear Valley on San Bernardino Mountain, Cal., June, 1892." As originally described the leaflets are "elliptical to oval," the "whole plant hoary with close, fine short hairs," while in Proc. Cal. Acad. II. **5**: 669. 1895, Jones says "*A. leucolobus* is well marked by the roundish, long-villous pubescent leaflets." Our specimens are not altogether typical, since they agree better with the later description.

Phaca tejonensis (Jones)

Astragalus Tejonensis Jones, Proc. Cal. Acad. II. **5**: 644. 1895.

No. 7815, collected May 1, at Keene Station in the Tehachapi mountains, Kern county, on grassy hillsides, where it is rather abundant. The decumbent stems are two or three feet long. It was first noticed about Girard Station, and Jones also records it from Tehachapi.

Phaca oxyphysa (A. Gray)

Astragalus oxyphysus A. Gray, Proc. Cal. Acad. **3**: 103.
1864.

Tragacantha oxyphysa Kuntze, Rev. Gen. Pl. **2**: 974. 1891.

No. 7792, collected April 28, on hills west of McKittrick, Kern county, in open gravelly ground. The numerous and dense creamy flowers stand almost horizontally. The mature pod is hardly acuminate at both ends as described in the Botany of California, although the apex of the immature pod is shortly acuminate, and when mature can hardly be called acute even, but is tipped with a mucro.

Homalobus curvicarpus (Sheldon)

Astragalus speirocarpus var. *curvicarpus* Sheldon, Minn. Bot. Stud. **1**: 125. 1894.

Astragalus speirocarpus var. *falciformis* A. Gray, Bot. Cal. **1**: 152. 1876; not *A. falciformis* Desf. 1802.

No. 8066, collected June 19, near Grenada Station, Siskiyou county, in dry ground along the railroad. The plants grew in rounded masses, the numerous stems ascending.

Homalobus californicus (A. Gray)

Astragalus collinus var. *californicus* A. Gray, Proc. Am. Acad. **12**: 54. 1876.

Astragalus californicus Greene, Bull. Cal. Acad. **1**: 157.
1885.

No. 8082, collected June 22, on banks along the railroad near Weed, Siskiyou county. The pods are either mottled or without markings. The type was collected at "Yreka, California, E. L. Greene," a point only a few miles north of Weed.

Hesperastragalus gen. nov.

Slender branched annuals. Leaves alternate, the stipules distinct and almost free from the petiole; leaflets few to many, the blades usually narrow and notched at the apex. Flowers

perfect, crowded in usually short-cylindrical heads. Calyx somewhat campanulate, the lobes about equal. Corolla some shade of purple or violet, very small, barely 2 mm. long. Stamens 10; filaments diadelphous; anthers alike. Ovary sessile. Ovules two only. Pod broadly ovoid, about as broad as long (2-3 mm), didymous, 2-celled and 2-seeded, the seeds about filling the cavity.

Type *Astragalus didymocarpus* H. & A.

Hesperastragalus didymocarpus (H. & A.)

Astragalus didymocarpus H. & A. Bot. Beech. 334. 1840.

Tragacantha didymocarpa Kuntze, Rev. Gen. Pl. 2: 944. 1891.

No. 7600, collected April 6, on the rising plain northeast of Kern, Kern county, in gravelly ground. The flowers in these specimens were a reddish purple, the branches ascending or erect. The type was evidently collected somewhere south of Montrey, as it does not occur as far north as the Bay region.

Hesperastragalus gambellianus (Sheldon)

Astragalus gambellianus Sheldon, Minn. Bot. Stud. 1: 19. 1894.

Astragalus nigrescens Nutt. Journ. Acad. Phila. II. 1: 152. 1848; not Pall. 1800.

A single specimen of this species was picked up at the river bridge near Redding, Shasta county, growing in gravel and sand. It is a much more diffuse plant than *H. didymocarpus*, the lower branches usually decumbent, the flowers more blue in color, not so dense, and the pods larger, not so deeply lobed, deflexed, much longer than the calyx; characters exactly the opposite of the other species. The type was collected by Gambel on Santa Catalina island, but it is common in the region about San Francisco.

PSORALEA MACROSTACHYA DC. Prodr. 2: 220. 1825.

No. 7926, collected May 31, on the banks of the Sacramento near Middle Creek Station, Shasta county, growing in damp places, the stems five or six feet high. There is little of the black pubescence which is present in the inflorescence of some specimens from other places, and the leaflets are comparatively narrow.

GLYCYRRHIZA GLUTINOSA Nutt. T. & G. Fl. N. A. 1: 298.
1838.

Glycyrrhiza lepidota var. *glutinosa* S. Wats. Bot. Cal. 1:
144. 1876.

No. 7958, collected June 3, on the banks of the Sacramento about a mile above Redding, Shasta county, growing in sand, and is very abundant at this place, many plants being connected by a system of creeping rootstocks.

Vicia pumila

Perennial: stems short, 2-3 dm. long, somewhat ascending or decumbent, sparingly branched, more or less 4-angled, sparingly pubescent with short hairs: stipules semisagittate, the largest 7 mm. long, the base 3 mm. across, cut into several lanceolate teeth: leaves 6 cm. long or less, the peduncles about 5 mm. long: leaflets 6-14, elliptical-oblong, maximum size 13 mm. long, 6 mm. wide, the apex truncate, shortly apiculate, somewhat silky pubescent on both sides with short appressed hairs, the under side a little paler than the upper, veins rather prominent and regularly pinnate; petiolules very short, barely 1 mm. long; the slender tendrils only 5 or 6 mm. long, 2 or 3 branched, coiled: flowers scattered, light violet-purple, 1.5 cm. long on peduncles of varying length, the longest about 2 cm.: calyx 7 mm. long, 3 or 4 mm. across, the three upper lobes linear-lanceolate, the long middle lobe less than 3 mm. long, 1 mm. wide at base, the two lower ones triangular-lanceolate, a little over 1 mm. long and as wide: banner 1.5 cm. long obovate when

spread out, 8 mm. wide across the eroded, slightly notched blunt apex, 3 mm. longer than the wings; these obliquely oblong, 3 mm. wide across the rounded apices; keel about 2 mm. shorter than the wings (or 1 cm. long), the hooded apex 3 mm. across, with a V-shaped notch 2 mm. deep: pods 3 cm. long, 1 cm. wide, nearly glabrous, about 6-seeded, the seeds 4 mm. across, rather dull brownish mottled with darker spots.

The type is no. 7938, collected June 1, 1905, near Shasta Retreat, Siskiyou county, California, in rich ground among shrubs. In habit it is much like *V. californica* Greene, but has different characters. That species is much more pubescent, has cuneate-obovate leaflets usually dentate at apex, and the flower is larger with perhaps different characters, but these are omitted in the original description.

VICIA TRUNCATA Nutt.; T. & G. Fl. N. 1: 270. 1838.

Vicia Americana var. *truncata* Brewer, Bot. Cal. 1: 158. 1876.

No. 7874, collected May 27, about a mile above Redding, Shasta county, growing near shrubs and twining over them. Some of the leaflets are almost 1 cm. wide.

GERANIACEAE

GERANIUM LONGIPES (Wats.) Goddings, Bot. Gaz. 37: 56. 1904.

Geranium Carolinianum var. *longipes* Wats. Bot. King Rep. 50. 1871.

No. 7977, collected June 5, a short distance below Shasta Springs, Siskiyou county, growing in rich loose soil recently burnt over. Watson does not state where the type was obtained, but says "this form is also frequent in California."

ERODIUM MACROPHYLLUM H. & A. Bot. Beech. 327. 1840.

No. 7831, collected May 5, on gravelly hills north of Tehachapi, Kern county, elevation 4000 feet. The leaves and peduncles are destitute of purplish gland tipped hairs, but they are present on pedicels and calyx. The specimens show fruit only, the species abundant at this particular place.

RUTACEAE

PTELEA CRENULATA Greene, *Pittonia*, **1**: 216. 1888.

No. 7959, collected along the Sacramento about a mile above Redding, Shasta county, where it is not uncommon. The leaflets appear to be quite glabrous except on the midvein. To the writer the odor of the fresh plant is strong and somewhat offensive rather than "aromatic." The type locality is not given in the original diagnosis, but its range appears to be from at least Mt. Diablo, Contra Costa county on the south, to Shasta county on the north.

POLYGALACEAE

POLYGALA CORNUTA Kellogg, *Proc. Cal. Acad.* **1**: 62. 1855.

No. 7915, collected May 31, on wooded hills back of Middle Creek Station, Shasta county, the woody stems erect or ascending, about two feet high, growing in dense clumps. In *Fl. Fran.* 93, Greene says: "not reported from the Coast Range; hence not collected by Nuttall, nor known to Bentham, when, unwittingly, he republished Nuttall's species [*P. Californica*] under the new name of *P. cucullata*." It does occur in the southern Coast Range, however, as attested by specimens in the herbaria of the California Academy of Sciences and of the writer, represented in the latter by a specimen collected by J. H. Barber in Santa Monica canyon, Los Angeles county.

No. 8103, collected July 14, near Nevada City, Nevada county, along Deer Creek, growing in open places under pine trees, the plants often lower and less erect than those of no. 7915. It was abundant at this place.

EUPHORBIACEAE

CROTON CALIFORNICUS MOHAVENSIS Ferguson, *Rep. Mo. Bot. Gard.* **12**: 65. 1901.

No. 7647, collected April 11, along the railroad on the edge of the low hills east of Bakersfield, Kern county, where it was

locally abundant, growing in sandy soil. The first specimen cited is "Cooper, Soda Lake, Fort Mohave, 1860-61," and probably is intended for the type.

TITHYMALUS CRENULATUS (Engelm.) Heller, *Muhlenbergia*, **1**: 55. 1904.

Euphorbia crenulata Engelm. Bot. Mex. Bound. 192. 1859.

Euphorbia leptocera Engelm.; Boiss. DC. Prodr. **15**: Part 2, 143. 1862.

No. 7981, collected June 5, along the railroad a short distance below Shasta Springs, Siskiyou county, the plants growing in rich loose soil, and plentiful. Originally collected near Monterey by Hartweg, but widely distributed in the state.

CELASTRACEAE

PACHYSTIMA MYRSINITES (Pursh) Raf. Am. Monthly Mag. **2**: 176. 1818.

Ilex myrsinites Pursh, Fl. Am. Sept. **1**: 119. 1814.

Myginda myrtifolia Nutt. Gen. **1**: 109. 1818.

Oreophila myrtifolia Nutt.; T. & G. Fl. N. A. **1**: 259. 1838.

No. 7976, collected June 1, along the Sacramento river near Shasta Retreat, Siskiyou county. A low shrub, not uncommon on wooded slopes, elevation 2400 feet. According to description this cannot be referred to *P. macrophyllum* Farr, Trans. and Proc. Bot. Soc. Penna. **1**: 412. 1904.

ACERACEAE

ACER CIRCINATUM Pursh, Fl. Am. Sept. **1**: 266. 1814.

No. 7923, collected June 1, at Dunsuir, Siskiyou county, just above the town along the river. A shrub 8 or 10 feet high with no tendency to be vine-like.

AESCULACEAE

AESCULUS CALIFORNICA (Spach) Nutt.; T. & G. Fl. N. A. **1**:
251. 1838.

Calothyrsus Californica Spach, Phaner. **3**: 35. 1834.

No. 7881, collected May 27, on the banks of the Sacramento at Redding, Shasta county. This handsome tree is common in the foothills of both the Sierra and the Coast Range. In the Tehachapi mountains it was noticed well up toward the summit, but with smaller leaves than is common in the northern form.

RHAMNACEAE

RHAMNUS ANONAEFOLIA Greene, Pittonia, **3**: 16. 1896?

No. 7969, collected June 5, along the Sacramento a short distance below Shasta Springs, Siskiyou county. A tall slender shrub perhaps eight feet high, sparingly branched above. This is not typical, the leaves varying somewhat from those of the type which was collected in the "mountains of Placer County." Some botanists would probably refer this to *R. purshiana*, but that species in typical form hardly occurs west of the Cascade mountains. Its native place is on the Clearwater river near the mouth of the Potlach, where the writer collected it in 1896.

RHAMNUS RUBRA Greene, Pittonia, **1**: 68. 1887.

Rhamnus Californica var. *rubra* Trelease, Trans. St. Louis Acad. **5**: 367.

No. 8087, collected June 22, near Igerna, Siskiyou county, elevation about 3800 feet. It is a handsome little shrub, and was at once recognized as distinct from any species known to the writer. It was first noticed along the Sacramento near Shasta Retreat, elevation 2400 feet. The type came from near Truckee, Nevada county, on the eastern side of the Sierra, elevation 6000 feet, and one would not expect it to occur about the headwaters of the Sacramento, but these specimens resemble the type very closely.

No. 8106, collected July 14, on the banks of Deer creek near Nevada City, Nevada county. This was a shrub considerably larger than no. 8087, and the leaves mostly larger. These specimens more nearly approach *C. californica* in habit and appearance, but the leaves lack the peculiar yellowish cast present in typical plants of that species. The glabrous red bark of the young branches is another distinguishing character. In *californica* they are dull brown, pubescent.

RHAMNUS TOMENTELLA Benth. Pl. Hartw. 303. 1849.

Rhamnus Californica var. *tomentella* Brewer & Wats. Bot.

Cal. 1: 101. 1876.

Rhamnus Purshiana var. *tomentella* Sargent, Silva, 2: 39.
pl. 63. f. 2.

No. 7895, collected May 29, at the River bridge near Redding, Shasta county, growing in sand and gravel under trees. Some of the leaves are four inches long and an inch and a quarter wide, shortly acuminate. As it grew here it was a slender spreading shrub perhaps six feet high, growing in clumps. The type, collected in "montibus Sacramento," probably along the Yuba river, had "foliis perennantibus oblongis acuminatis 1½-2½ poll. longa, 6-9 lin. lata."

No. 8104, collected July 14, near Grass Valley, Nevada county, is more nearly typical in that it has narrower leaves, which are also thicker than those of no. 7895. It grew in more exposed situations, and is from the type region.

No. 7859, collected May 26, on dry hills about two miles west of Redding, Shasta county, has rather small leaves, more like those of the type in size, but the most of them merely acutish. The shrubs were growing on a stony ridge with a southerly exposure.

RHAMNUS CROCEA Nutt.; T. & G. Fl. N. A. 1: 261. 1838.

No. 7818, collected May 1, near Keene Station in the Tehachapi mountains, Kern county. Nuttall collected the type

from "bushy hills and thickets about Monterey," and says the "branches spinescent at the extremity," and "leaves about half an inch long, lucid, when dry of a bright yellowish-brown beneath." The leaves in our specimens are larger, although of variable size, green beneath. It cannot be referred to *R. ilicifolia* Kellogg, which also has leaves with the under side yellow, but ovate and acute, and apparently occurs in Lake county only.

CEANOTHUS NEVADENSIS Kellogg, Proc. Cal. Acad. **2**: 152. f. 45. 1863.

No. 7873, collected May 27, near the railroad about a mile above Redding, Shasta county. This has rather large leaves, some of them over three inches long and correspondingly broad. They are mostly more oblong than in Kellogg's figure, but the venation is the same, and not like it is in specimens cited by Greene, Leaflets, **1**: 66, at least as regards the writer's 5841 and 5881 (not 5886). The type of *C. nevadensis* came from the Yosemite.

No. 7926, collected June 1, along the Sacramento near Dunsmuir, Siskiyou county. This has small leaves an inch or less in length and a narrow simple panicle two or three inches long. It is more pubescent than no. 7873, and in some respects answers to the description of *C. peduncularis* Greene, Leaflets, **1**: 69, 1904.

CEANOTHUS VELUTINUS Dougl.; Hook. Fl. Bor. Am. **1**: 125. pl. 45. 1830.

No. 8046, collected back of Sisson, Siskiyou county, along the Mt. Shasta trail at perhaps 5000 feet, where it is one of the prevailing shrubs. Douglas got the type on "subalpine hills near the sources of the Columbia; and at the 'Kettle Falls.'"

CEANOTHUS CORDULATUS Kellogg, Proc. Cal. Acad. **2**: 124. f. 39. 1863.

No. 7968, collected June 5, along the Sacramento a short distance below Shasta Springs, Siskiyou county, elevation 2500

feet. Here it is found sparingly, but on the plateau just above around the base of Mt. Shasta it is the prevailing shrub in dry sandy soil often covering large areas. It is especially abundant at elevations of from 3000 to 4000 feet, *C. velutinus* taking its place at about 4000 feet. The leaves are somewhat larger than those of the type from Washoe, Nevada, which had them "one quarter to one half an inch long, rarely three-eighths broad."

CEANOTHUS INCANUS T. & G. Fl. N. A. 1: 265. 1838.?

No. 8051, collected June 16, back of Sisson along the Mt. Shasta trail, elevation about 4000 feet. This is by no means typical, and may not belong here at all. It occurs at the place where *C. velutinus* and *C. cordulatus* meet, and bears some resemblance to both. In habit it is more like *velutinus* and the finely serrulate leaves are more like those of that species in shape, but are smaller, thinner, not shining above. The appearance of the branches and the inflorescence suggests *cordulatus*. It is plentiful along the railroad between Upton and Black Butte Summit, but is not found much above or below 4000 feet.

VITACEAE

VITIS CALIFORNICA Benth. Bot. Sulph. 10. 1844.

No. 7894, collected May 29, at the river bridge near Redding, Shasta county, growing in sand and gravel, the plants not climbing but low, much intertwined, covering considerable areas. It is also plentiful above Redding along the river, and is no doubt abundant all through that country.

MALVACEAE

SIDALCEA ASPRELLA Greene, Bull. Cal. Acad. 1: 78. 1885.

No. 8105, collected July 14, along the electric railroad between Grass Valley and Nevada City, Nevada county. This is not quite so tall, but more robust and spreading than a specimen from Sweetwater creek, Eldorado county, collected by Mrs. Curran, and cited as part of the type. The lobes of the leaves

are more rounded and broader in our plant, which is rather diffuse, the branches not rising far above the ground. It agrees much better with the plant collected by Greene himself near Comptonville, Yuba county, also cited under the original description.

No. 7876, collected May 27, near the railroad a short distance above Redding, Shasta county, the plants tall, two or three feet, erect, growing among or near shrubs. This has fewer, longer and less stellate hairs on the stem than the type, most of them merely forked, but it has the fruit characters of *asprella*.

SIDALCEA CAMPESTRIS Greene, Bull. Cal. Acad. **1**: 76. 1885.

No. 7987, collected June 5, on the plateau above Shasta Springs, Siskiyou county, growing in dry sandy soil in open places in the woods. It is not typical being much less pubescent, and has fewer, more spicate flowers than the type. The label of the type bears no other record than "Pacific coast plants," and "dry prairies, July 1881, but Mr. Howell probably got it somewhere in Oregon.

SIDALCEA MALVAEFLORA (Moc. & Sesse) Gray, Pl. Wright. **1**: 16. 1852.

Sida malvaeflora Moc. & Sesse in DC. Prodr. **1**: 474. 1824.

Sidalcea humilis Gray, Mem. Am. Acad. II. **4**: 20. 1849.

Sidalcea delphinifolia var. *humilis* Greene, Fl. Fran. 106. 1891.

No. 7830, collected May 5, in moist places along the railroad near Tehachapi, Kern county. These plants are much less pubescent than those from the coast region, but otherwise do not seem to differ. The type locality is given as "in Mexico," but in the Synoptical Flora Gray says "doubtless collected at Monterey" [California]. If this latter supposition is correct, the name *S. humilis* is necessarily a synonym.

MALVASTRUM PARRYI Greene, Fl. Fran. 108. 1891.

No. 7592, collected April 6, along the Santa Fe railroad near Bakersfield, Kern county. It is plentiful about Bakersfield, and is identical with a specimen collected by Brandegee and labeled as this species. The stems are often prostrate, a foot or more long.

VIOLACEAE

VIOLA PURPUREA Kellogg, Proc. Cal. Acad. 1: 56. 1855.

No. 7721, collected April 18, near Girard Station in the Tehachapi mountains, Kern county, on grassy slopes. Except that this is a little more pubescent than the original, it answers very well to the description. There is a drawing of this species in the herbarium of the California Academy labeled "from a sp. of Placerville," but a specimen collected on Mt. Diablo by Kellogg himself is very like the drawing.

No. 8090, collected June 22, along the railroad near Igerna, Siskiyou county. This is not typical, the upper leaves not "obtusely crenate," but are acute and sharply toothed. The plant is not uncommon in that region, growing in a mixture of clay and sand.

VIOLA LOBATA Benth. Pl. Hartw. 298. 1849.

No. 7927, collected June 1, at Dunsmuir, Siskiyou county, in rich soil on steep wooded slopes among shrubs. It is common in this region, and agrees well with the description of the original in being glabrous, but none of the leaves are subreniform. They are ovate, the largest very broadly so, all more or less acuminate and irregularly lobed. The type came from "montibus Sacramento," somewhere in the foothills of Butte county.

✓ VIOLA DOUGLASII Steud. Nom. 2: 14. 1841.

Viola chrysantha Hook. Ic. pl. 49. 1837; not Schrad. 1834.

No. 7837, collected May 5, on hills north of Tehachapi.

Kern county, elevation 4000 feet. It is abundant there, growing in roundish mats, the several stems barely ascending. It is said to occur throughout the State, and has considerable altitudinal range, occurring at low elevations in the Bay region.

VIOLA AUSTINAE Greene, *Pittonia*, **5**: 30. 1902.

No. 7125, collected August 7, 1903, about midway between Donner Lake and Summit, Nevada county, elevation 6500 feet, growing in damp grassy places along the road. The plants are in fruit only, but undoubtedly belong to this species. Mrs. Austin got the type in Butterfly Valley, Plumas county.

LOASACEAE

ACROLASIA AFFINIS (Greene) Rydb. Bull. Torr. Club, **30**: 278. 1903.

Mentzelia affinis Greene, *Pittonia*, **2**: 103. 1890.

No. 7614, collected April 7, at Caliente, Kern county, where it is not uncommon in sandy ground. A specimen collected by Brandegee at the same place is labeled *Mentzelia gracilentia*, but it can hardly be that species, although it agrees in having pubescent stems instead of "white and shining glabrous stems," as in the type. The flowers have an orange-colored center. It is probably undescribed, but mature fruit is lacking.

No. 7675, collected April 13, at Kramer, San Bernardino county, in the Mojave desert, has stems agreeing with the type, but the flowers are not large enough and the calyx teeth too long. The capsule has hairs with pustulate base, as in the type.

Acrolasia viridescens

Annual: stems erect but rather weak, 2 dm. high, diffusely branched, white and shining, glabrous or nearly so: leaves bright green, sparingly scabrous, sessile, the lower oblong, 7 cm. long, 1-2 cm. wide, sinuate pinnatifid, the lobes obtuse; leaves of the middle part of the stem similar but smaller; those of the upper part lanceolate or ovate, somewhat irregularly dentate, acumi-

nate, 1-2 cm. long, 4-8 mm. wide: flowers in the upper axils as well as terminal, pale yellow, open in the middle of the afternoon: calyx 2 mm. long, shortly hispid, the narrow linear lobes divided to the base: petals 3 mm. long, obovate-oblong, less than 2 mm. wide across the rounded apex: capsules about 15 mm. long, linear-clavate, barely 2 mm. wide above, hispid, the hairs barbellate: seeds whitish, very small, less than 1 mm. across, in cross section roundish triangular or somewhat quadrate, the angles obtuse, two of them grooved.

The type is no. 7604, collected April 6, 1905, on the rising plain back of Kern, Kern county, growing under the shade of shrubs. This is no doubt part of the composite *Mentzelia dispersa* of Watson, undoubtedly composed of several species, among them perhaps **A. pinetorum** (*Mentzelia pinetorum* Heller, Bull. So. Cal. Acad. **2**: 69. 1903). But the original, *Mentzelia albicaulis* var. *integrifolia* Wats. Bot. King Rep. 114, which Watson says is the same as *dispersa*, has priority of publication, and is apparently quite different from our plant, although one could judge better if it were properly described.

ACROLASIA PECTINATA (Kellogg) Rydb. Bull. Torr. Club, **30**: 278. 1903.

Mentzelia pectinata Kellogg, Proc. Cal. Acad. **3**: 40. f. 9. 1868.

No. 7634, collected April 8, on grassy slopes of the bluffs of Kern river above Bakersfield, Kern county. It is also plentiful on the ridges about the mouth of Kern canyon. The type came from the "mountains above Visalia." It is apparently a relative of *A. gracilentia* and is one of the handsomest species, the orange of the petals shading into bright coppery red in the center. The petals in our specimens are not notched but entire surmounted by a very short apiculation.

ACROLASIA AUREA (Lindl.) Rydb. Bull. Torr. Club, **30**: 278.
1903.

Bartonia aurea Lindl. Bot. Reg. **22**: pl. 1831. 1836; not

Mentzelia aurea Nutt. Gen. 300. 1818.

Mentzelia Lindleyi T. & G. Fl. N. **1**: 533. 1840.

No. 7692, collected April 14, at Randsburg, Kern county, where it is abundant on stony hillsides. The flowers are open both day and night apparently, since it was collected late in the evening, was open early the next morning, and continued open during the whole morning. Our specimens very much resemble the plate in the Botanical Register, although some parts of the description do not accord. But they are totally different from the *Mentzelia Lindleyi* of the Bay region, and supposedly from the region where Douglas obtained the type.

EPILOBIACEAE

BOISDUVALIA DENSIFLORA (Lindl.) Wats. Bot. Cal. **1**: 233. 1876.

Oenothera densiflora Lindl. Bot. Reg. pl. 1593. 1833.

Boisduvalia Douglasii Spach, Monog. Onagr. 80. pl. 31. f.
2. 1835.

No. 7913, collected May 31, on the hills not far from Keswick, Shasta county, growing in moist ground near a small stream. In habit and form of leaves this is much like the figure of the original, but the flowers are fewer and smaller. Strictly typical specimens of this species are rare, there being only one or two in the herbarium of the California Academy of Sciences which closely approach it.

BOISDUVALIA IMBRICATA (Greene) Heller, Muhlenbergia, **1**: 42.
1904.

Boisduvalia densiflora var. *imbricata* Greene, Fl. Fran. 225.
1891.

No. 8107, collected July 14, along the electric railroad about midway between Grass Valley and Nevada City, Nevada county, growing in damp ground in a meadow. The capsules, which

are concealed by the broadly ovate acuminate bracts, are 1 cm. long, 2 mm. in diameter, acute, silky with appressed hairs; the seeds greyish-brown, not shining.

Boisduvalia macrantha

Annual, the larger plants with very strongly developed roots: stems occasionally branched near the base in large plants, erect, 1-4.5 dm. high, glabrous below, softly pubescent above, leafy throughout, the leaves ascending, sessile, the lowest glabrous, somewhat oblanceolate, 2 or 3 cm. long, about 8 mm. wide, acutish, with few inconspicuous teeth; those of the middle part of the stem lanceolate, the base not narrowed, acute or shortly acuminate, 3 or 4 cm. long, 6 mm. wide, sharply but distantly serrulate, somewhat pubescent; those of the upper part of the stem usually entire, more acuminate, more pubescent and somewhat wider: calyx villous, 7 cm. long, cleft nearly to the base into linear-lanceolate lobes somewhat over 1 mm. wide at the base: corollas rose-purple, 12 mm. long; the petals cuneate, 7 mm. wide across the top, 2-lobed by a notch 2 mm. deep, the lobes rounded and obtuse, delicately veined, the veins anastomosing along the edges: longer stamens 7 mm. long, shorter ones 5 mm. long, the oblong anthers a little over 1 mm.: pistil 7 mm. long, the disc-like stigma 1 mm. across: capsules sessile, linear-lanceolate, 2 cm. long, a little over 2 mm. across, the apex slender and beak-like: seeds greyish-brown, slightly shining, rather large, over 1 mm. long, somewhat half diamond-shaped viewed from the side. The measurements the maximum ones; the floral characters drawn from living plants.

The type is no. 7906, collected May 30, 1905, about two miles northeast of Redding, Shasta county, California, in moist gravel and sand, where it was locally abundant. It is a handsome species, well marked in all its characters and remarkable for its large flowers. It may perhaps be well distributed over the slightly elevated plateau at the upper end of the Sacramento valley, as there is a small specimen of it from Butte county in the herbarium of the California Academy of Sciences.

CLARKIA RHOMBOIDEA Dougl.; Hook. Fl. Bor. Am. **1**: 214.
1833.

No. 7658, collected April 12, on the ridge on the north side of the mouth of Kern canyon, growing near rocks and somewhat sheltered. This was referred to *C. virgata* as it seemed to resemble Hansen's specimen mentioned in the original description, but now upon comparing our plant with the description it is found to be different. The glaucescent stems are glabrous, the claw of the petal is not short and broad but long and slender, and the slender glabrous capsule is sessile, taper pointed, little if at all curved.

Godetia Spach. Hist. Phaner. **4**: 386. 1835.

The determinations by Miss Eastwood

GODETIA WILLIAMSONI (Dur. & Hilg.) Wats. Bot. Cal. **1**: 230.
1876.

Oenothera Williamsoni Dur. & Hilg. Pac. R. R. Rep. **5**:
7. pl. 5. 1855.

No. 7445, collected May 25, 1904, in the foothills west of Los Gatos, Santa Clara county, where it occurs sparingly near the reservoir in dry grassy ground. This is a low form with small flowers. In speaking of this and the next number, Miss Eastwood writes that "none of the plants are exactly typical, for generally they are more branched above the base." The species has not heretofore been reported from the Coast Range. The type came from "Fort Miller," on the San Joaquin river near the present town of Pollasky, Fresno county.

No. 7446, collected May 25, 1904, in the foothills west of Los Gatos, Santa Clara county, where it was rather plentiful in dry grassy places near the reservoir. This form has considerably larger flowers than 7445, with the markings slightly different.

GODETIA QUADRIVULNERA (Dougl.) Spach, Hist. Phaner. **4**: 389. 1835.

Oenothera quadrivulnera Dougl.; Lindl. Bot. Reg. *pl.* 1119. 1827.

No. 7441, collected May 25, 1904, in the foothills west of Los Gatos, Santa Clara county, where it is found sparingly in dry grassy places near the reservoir. The flowers are small, of a very dark purple.

GODETIA RUBICUNDA Lindl. Bot. Reg. *pl.* 1856. 1836.

No. 7479, collected June 1, 1904, in the foothills west of Los Gatos, Santa Clara county, not uncommon along roadsides and in fields. This is a tall plant, often much branched above, the rather large rose-purple flowers with a lighter reddish center.

GODETIA ROSTRATA Eastw. ined.

No. 7902, collected May 30, in a meadow about three miles northeast of Redding, Shasta county. It was also noticed near the river bridge not far from Redding.

ANOGRAL CALIFORNICA (Wats.) Small, Bull. Torr. Club, **23**: 176. 1896.

Oenothera albicaulis var. *Californica* Wats. Proc. Am. Acad. **8**: 582. 1873.

Oenothera Californica Wats. Bot. Cal. **1**: 223. 1876.

No. 7640, collected April 10, in fields northwest of Bakersfield, Kern county. This is a nocturnal bloomer, but may be found open and in good condition until nearly noon if the day is cloudy. It is a low plant with large white flowers fading pink.

TARAXIA PALMERI (Wats.) Small, Bull. Torr. Club, **23**: 184. 1896.

Oenothera Palmeri Wats. Proc. Am. Acad. **12**: 251. 1877.

No. 7757, collected April 24, at the foot of the mountain about three miles southwest of Mojave, Kern county, in the Mo-

jave desert, growing on a low gravelly ridge, and rather abundant. This has been confused by some with *T. graciliflora*, but the two are not at all alike, this species having very small flowers. It was "collected in Arizona by Dr. Edward Palmer."

SPHAEROSTIGMA CONTORTUM (Dougl.) Walp. Rep. 2: 78. 1843.

Oenothera contorta Dougl.; Lehm. in Hook. Fl. Bor. Am.

1: 214. 1833.

Sphaerostigma strigulosum F. & M. Ind Sem. Petrop. 2: 22. 1835.

Oenothera strigulosa T. & G. Fl. N. A. 1: 512. 1840.

Oenothera parvula Nutt.; T. & G. Fl. N. A. 1: 511. 1840.

Sphaerostigma parvulum Walp. Rep. 2: 78. 1843.

No. 7888, collected May 29, at the river bridge near Redding, in sand. These plants do not seem to differ from specimens from the sand hills at San Francisco and Bodega bay. *S. strigulosum* to which no more definite locality is assigned than "Nova California," does not seem to be distinct from *S. contortum*, the type of which came from "sandy barren soil, on the interior banks of the Columbia River."

SPHAEROSTIGMA CAMPESTRE (Greene) Small, Bull. Torr. Club,

23: 189. 1896.

Oenothera campestris Greene, Fl. Fran. 216. 1891.

No. 7590, collected April 5, on sandy plains at Oil City near Bakersfield, Kern county. Neither of the three numbers collected are "more or less hirsute-pubescent throughout," but are glabrous except for some short hairs on the leaves and extreme upper part of the stem; neither do the flowers turn "brick-red," at least not when drying, and the writer has no recollection of seeing the changing color in the field. The petals are bright yellow, broadly obovate orbicular, 8 mm. long, 10 mm. wide, with two rows of small red dots in the throat. The very narrow leaves are distantly dentate with inconspicuous teeth.

No. 7728, collected April 20, at Sunset, Kern county, on dry gravelly hillsides. It differs from no. 7590 only in the more pronounced serration of the leaves.

No. 7762, collected April 24, on the desert about three miles southwest of Mojave, Kern county, growing in sand. It differs from the other numbers in having entire leaves, larger flowers without the red dots in the throat. This may be *S. campestre helianthemiflorum* (Levl.) Aven Nelson, but the writer has seen no description of that plant.

Chylisma clavaeformis (Torr.)

Oenothera clavaeformis Torr. Frem. Rep. 314. 1845.

Oenothera scapoidea var. *aurantiaca* Wats. Proc. Am. Acad.

8: 595. 1873.

Chylisma scapoidea clavaeformis Small, Bull. Torr. Club,

23: 194. 1896.

No. 7691, collected April 14, at Randsburg, Kern county, where it is plentiful on stony hillsides. The capsule in our specimens is shorter than the pedicels, in which it does not agree with the original. Even if our plant should prove to be distinct, the original *clavaeformis* is certainly more than a form of *scapoidea*.

EPILOBIUM MINUTUM Lindl.; Hook. Fl. Bor. Am. 1: 207. 1833.

No. 7950, collected June 1, opposite Upper Soda Spring, Siskiyou county, growing on rich wooded slopes, the slender erect plants abundant in a limited area.

DATISCAEAE

DATISCA GLOMERATA (Presl) Brewer & Wats. Bot. Cal. 1: 242. 1876.

Tricerastes glomerata Presl, Rel. Haenk. 2: 88. pl. 64. 1835.

No. 7917, collected May 31, in moist places along the Sacramento near Middle Creek Station. Lake county is the most northerly station heretofore recorded for this plant.

AMMIACEAE

BOWLESIA SEPTENTRIONALIS C. & R. Cont. U. S. Nat. Herb. **7**: 31. 1900.

No. 7779, collected April 26, about a mile within Kern canyon on steep northerly slopes, the plants shaded and protected by other vegetation. The species is a variable one, and is widely distributed in the State. The type was collected near Tucson, Arizona.

WASHINGTONIA BREVIPES C. & R. Cont. U. S. Nat. Herb. **7**: 66. 1900.

No. 7430, collected May 18, 1904, in the foothills west of Los Gatos, Santa Clara county, where it is not uncommon on wooded slopes. It is found almost throughout California, extending north into Washington and Idaho.

No. 7978, collected June 5, in rich loose ground a short distance below Shasta Springs, Siskiyou county. This is from the type region "Mount Shasta and vicinity."

PTERYXIA CALIFORNICA C. & R. Cont. U. S. Nat. Herb. **7**: 172. 1900.

No. 7953, collected June 3, in sand among rocks along the Sacramento just above Middle Creek station, Shasta county. It is rather plentiful here, but no doubt brought down by the stream from the mountains above. The type was collected near "Sisson, Siskiyou County."

LOMATIUM DASYCARPUM (T. & G.) C. & R. Cont. U. S. Nat. Herb. **7**: 218. 1900.

Peucedanum dasycarpum T. & G. Fl. N. A. **1**: 628. 1840.

Peucedanum Pringlei C. & R. Bot. Gaz. **13**: 209. 1888.

No. 7265, collected March 16, 1904, on the summit of the first ridge west of Los Gatos, Santa Clara county, growing in stony places in a field. The type was collected somewhere in the coast region by Douglas. Coulter & Rose credit the species

to "southern California," though citing a specimen from Angel Island, San Francisco, but it has been found still further north, in the mountains of Sonoma, Napa and Solano counties.

LOMATIUM TOMENTOSUM (Benth.) C. & R. Cont. U. S. Nat. Herb. **7**: 219. 1900.

Peucedanum tomentosum Benth. Pl. Hartw. 312. 1849.

No. 7866, collected May 26, in gravel and sand at the river bridge near Redding, Shasta county. This is a well marked species on account of the very large tomentose fruit. The type was found by Hartweg in Butte county near Chico "in omnibus exsiccatis fluviorum."

LOMATIUM UTRICULATUM (Nutt.) C. & R. Cont. U. S. Nat. Herb. **7**: 215. 1900.

Peucedanum utriculatum Nutt.; T. & G. Fl. N. **1**: 628. 1840.

No. 7635a, collected April 8, along the base of the bluffs opposite Oil City, Kern county, growing in dry hard ground. The type was collected by Nuttall near Portland, Oregon.

No. 7865, collected May 26, on hills about two miles west of Redding, Shasta county, in stony places. This is one of the commonest species, occurring throughout California.

CORNACEAE

SUIDA STOLONIFERA RIPARIA Rydb. Bull. Torr. Club, **31**: 573. 1904.

No. 8043, collected June 17, on the banks of the Sacramento west of Sisson, Siskiyou county. The type of this form was collected at "Crystal Creek Colorado, 1901, Baker, 257." Our Pacific coast plant should be distinct on geographical grounds, but it has not even been considered different from the far eastern *Cornus stolonifera*. In his Flora Dr. Small uses the original spelling *Svida*.

ERICACEAE

AZALEA OCCIDENTALIS T. & G. Pac. R. R. Rep. 4: 116.
1857.

Rhododendron occidentale Gray, Bot. Cal. 1: 458. 1876.

No. 7948, collected June 1, along the Sacramento opposite Upper Soda Spring, Siskiyou county, in moist thickets. It is common along the upper Sacramento in moist places from Pit river north. The species occurs almost throughout the State, and was first detected in the Bay region by Douglas. Hartweg next collected it "in uliginosis prope Santa Cruz," but these early specimens were referred to the eastern *Azalea calendulacea*.

ARCTOSTAPHYLOS MANZANITA Parry, Bull. Cal. Acad. 2: 491.
1887.

No. 7872, collected May 27, in thickets near the railroad a short distance above Redding, Shasta county, growing in company with *A. viscida* but much less frequent. Here it is a small shrub six or seven feet high.

ARCTOSTAPHYLOS VISCIDA Parry, Bull. Cal. Acad. 2: 492. 1887.

No. 7853, collected May 25, a short distance above Redding, Shasta county, where it is very abundant, growing in clumps. The pedicels are very viscid.

No. 8108, collected July 14, near Grass Valley, Nevada county, where it is abundant on dry gravelly hillsides. This must be near its southern limit, the range being from the Oregon line to central California.

PRIMULACEAE

DODECATHEON JEFFREYI Moore; Van Houtte, Fl. des Serres, II.
16: 99. *pl. 1662*. 1865-67.

No. 8091, collected June 22, in wet meadows near Igerna, Siskiyou county. This is probably our largest and handsomest species, and the specimens are a near match to the figure. It

was noted at several places in meadows between Edgewood and Gazelle. The elevation where this species occurs ranges from about 2800 to 3500 feet, but it is always mentioned as inhabiting the high Sierra Nevada.

Glaux acutifolia

Perennial by rather stout rootstocks, glabrous, green and not glaucous: stems more or less branched, ascending but diffuse, angled, 8 cm. long or less: leaves opposite, sessile and somewhat clasping, 1 cm. long or less, a few of the lowest lanceolate with base nearly 2 mm. wide, the others linear, 1 mm. wide, curved-ascending, all acute and mucronately pointed: flowers small, nearly sessile, 2 mm. long, pinkish or white, the petaloid calyx divided almost to the base, the lobes ovate-oblong, acutish, with a prominent greenish midvein on the convex exterior: filaments subulate, half the length of the calyx: anthers pale yellow, oblong elliptical, versatile: style a little longer than the stamens in the flowers examined: capsule not seen.

The type is no. 8073, collected June 20, 1905, at Gazelle, Siskiyou county, California, in the Shasta valley, abundant in moist saline meadows.

In Rhodora, 4: 215. 1902, Mr. Fernald described a sea-board form distinct from *Glaux maritima*, but did not separate any of the inland forms. The narrow acute leaves of our plant attracted attention at once, and in this character it is unlike any specimen in the herbarium of the California Academy. In the Illustrated Flora, 2: 592, *G. maritima* is described as having the calyx lobes "about equalling the campanulate tube," the anthers "cordate," as opposed to the characters of our plant as given above. The lower and broader leaves are shorter than the upper ones, and the latter usually have short branches in the axes, giving them a fascicled appearance. The peculiar candelabra-like curving of the upper leaves is characteristic.

OLEACEAE

FRAXINUS OREGANA Nutt. Sylva, **3**: 59. *pl.* 99. 1842-53.

No. 7956, collected June 3, along the Sacramento near Middle Creek Station, Shasta county. A small tree with leaves densely tomentose beneath. The original spelling is *Oregona*.

GENTIANACEAE

FRASERA NITIDA Benth. Pl. Hartw. 322. 1849.

No. 7879, collected May 27, in thickets a short distance above Redding, Shasta county. It may be found here and there in rich shaded places along the upper Sacramento north of Redding. The type was collected "in montibus Sacramento."

APOCYNACEAE

APOCYNUM OBLONGUM Greene, Pittonia, **5**: 65. 1902.

No. 8109, collected July 14, near Grass Valley, Nevada county, in moist places, the plants large, about four feet high and much branched. This is more copiously flowered than the type, and the sepals equal the tube of the corolla. It may be doubted whether *A. cannabinum*, a native of the Atlantic side of the continent, occurs on the Pacific coast.

Apocynum viarum

Perennial, rather low, about 5 dm. high, moderately branched, the lateral branches not exceeding the main stem, glabrous throughout: leaves dull green, the larger ones ovate-lanceolate, about 8 cm. long, 4 cm. wide, the smaller upper ones about half that size, almost elliptical, all merely acutish, cuspidate, midvein pale and prominent; petioles 3 or 4 mm. long: bractlets of the inflorescence membranous, linear-lanceolate, 2 or 3 mm. long, 1 mm. wide: the irregular cymes narrow and rather strict: pedicels 5 mm. long or less, slender, almost filiform: calyx campanulate, 2 mm. long, the lanceolate acute lobes over 1 mm. long, scarious margined, equalling the tube of the corolla: flow-

ers pinkish or purple tinged, narrowly campanulate, 5 mm. long, 3 mm. across, the lobes spreading when fully open; tube 3 mm. long, lobes 2 mm. long, oblong, a little over 1 mm. wide, the apices narrowed but hardly acute: stamens 2 mm. long, the broad filament 1 mm. long, nearly half its length covered by the anther, this upper part broader than the lower, the truncate end eroded; anthers lanceolate, obtusish, 1 mm. long, the base notched, its lobes rounded: appendages between the stamens broadly triangular, 1 mm. long and as wide, shortly apiculate: stigma ovoid, entire.

The type is no. 8110, collected July, 14, 1905, on the outskirts of Nevada City, Nevada county, California, along the roadside and on the edge of a little meadow on the line of the electric railroad. This species is apparently not closely related to any of the described ones, and is not of the *cannabinum* type.

ASCLEPIADACEAE

GOMPHOCARPUS CORDIFOLIUS Benth.; Gray, Bot. Cal. **1**: 477. 1878.

Acerates cordifolia Benth. Pl. Hartw. 323. 1849.

Asclepias cordifolia Jepson, Fl. West. Mid. Cal. 384. 1901.

No. 7860, collected May 26, on hills about two miles west of Redding, Shasta county, sheltered by rocks. The species has considerable altitudinal range, this Redding station being at perhaps 1200 feet, while it occurs at over 4000 feet in the mountains of Lake county, and at 6000 feet near Donner Lake on the east side of the Sierra. The type came from "valle Sacramento" at the Marysville Buttes.

CONVOLVULACEAE

CONVOLVULUS MALACOPHYLLUS Greene, Pittonia, **3**: 326. 1898.

Calystegia villosa Kellogg, Proc. Cal. Acad. **5**: 17. 1873.

Convolvulus villosus Gray, Proc. Am. Acad. **11**: 90. 1876; not Pers. 1805.

No. 7988, collected June 5, on the plateau above Shasta

Springs, Siskiyou county, in open gravelly places in the woods; also noticed on the ridge west of Sisson. The type came from Cisco, Placer county.

CONVOLVULUS POLYMORPHUS Greene, *Pittonia*, **3**: 331. 1898.

No. 7997, collected June 8, on the hills west of Yreka, Siskiyou county. These plants are somewhat smaller than the type, as they are less than two feet, but they appear to belong with this species. The type locality is not given except "northern California and southern Oregon."

CONVOLVULUS FRUTICETORUM Greene, *Pittonia*, **3**: 333. 1898.

No. 7955, collected June 3, along the Sacramento near Middle Creek station, Siskiyou county. This is glabrous rather than puberulent, the stems probably 8 or 10 feet long, climbing over and almost covering shrubs, the peduncles commonly twice the length of the leaves. It is common about Redding. The species is poorly described, but from the range our plant belongs here rather than with *C. purpuratus*.

POLEMONIACEAE

COLLOMIA HETEROPHYLLA Hook. *Bot. Mag. pl.* 2895. 1829.

No. 7947, collected June 1, along the railroad opposite Upper Soda Spring, Siskiyou county, under or near shrubs. In *Bot. Reg.* **16**: *pl.* 1347, it is stated that it is a "native of the north-west of North America, whence it was sent to the Horticultural Society by Mr. Douglas in 1826." It is common in California and variable, being especially abundant and luxuriant in places recently burnt over.

MICROSTERIS CALIFORNICA Greene, *Pittonia*, **3**: 302. 1898.

No. 7828, collected May 5, at Tehachapi, Kern county, in moist sandy soil along the railroad. Some plants are taller, less diffuse than others, with stems less pubescent. The corolla lobes appear to be entire. No type locality is given except the whole of middle and northern California. In these specimens the seeds are elliptical-oblong, pale greenish brown.

MICROSTERIS MICRANTHA (Kellogg) Greene, Pittonia, **3**: 303. 1898.

Collomia micrantha Kellogg, Proc. Cal. Acad. **3**: 18. 1863.

No. 8023, collected June 13, along the railroad a short distance above Shasta Springs, Siskiyou county, found in a limited area only. The seeds are larger, darker and rounder than those of *M. californica* cited above. It is native to the eastern slope of the Sierra, and has not been reported from northern California.

Gilia ~~virgata~~ ~~floribunda~~ pluriflora

Gilia virgata var. *floribunda* Gray, Proc. Am. Acad. **8**: 273. 1870; not *G. floribunda* Gray, l. c. 267.

No. 7734, collected April 20, at Sunset, Kern county, on dry gravelly hills, abundant. This plant with its glabrous stems, corymbose branches, divided leaves and differently shaped flowers, is certainly distinct. It has petals with shorter and broader lobes than *G. virgata* with which it has been associated.

No. 7742, collected April 22, at Oil City, Kern county, in sand. Here the plants were taller and less branched from the base than those of no. 7734.

GILIA CONGESTA Hook. Fl. Bor. Am. **2**: 75. 1838.

No. 8013, collected June 9, at Montague, on the plain just north of the town, but not plentiful. The type came from the "sandy plains of the Columbia." It occurs as high as 9000 feet in the Sierra. The elevation at Montague is some 2500 feet.

GILIA STAMINEA Greene, Erythea, **3**: 105. 1895.

No. 7663, collected April 12, on the ridge on the north side of the mouth of Kern canyon, Kern county, where it is plentiful. No type locality is given except "very common throughout the interior of California."

No. 7832, collected May 5, on the hills north of Tehachapi, Kern county, elevation 4000 feet. These plants are much less inclined to branch than in no. 7663, many of them simple. It is a pretty species, the large heads pale violet blue.

No. 7573, collected March 22, near the summit of the ridge opposite South Butte, Marysville Buttes, Sutter county. The calyx is smoother and the lobes a little narrower than in the typical plant, but it has the large heads and broad petaled flowers of this species.

GILIA PALLIDA Heller, *Muhlenbergia*, **1**: 43. 1904.

No. 8081, collected June 20, at Gazelle, Siskiyou county, along the railroad, where it may have been introduced. The type is from the Petrified Forest, Sonoma county, but it occurs as far north as the high mountains of Lake county, and may continue thence into northern California. Its relationship is rather with *G. capitata* than with *G. staminea* as stated in the original diagnosis.

Gilia glandulifera

Annual, tall, 8 dm. or less, branched from near the base, the branches ascending, glabrous: basal leaves many in a rosette like tuft, about 8 cm. long, pinnately parted into numerous oblong or linear mucronately pointed segments 1-3 mm. wide; the stem leaves similar but scattered, usually only one below each branch; the uppermost short and reduced to few divisions: peduncles long and scape-like, naked, some of them 3 dm. long: calyx narrowly campanulate, 3 mm. long, 2 mm. wide across the top, the lobes equalling the tube, lanceolate, acerose pointed, green with hyaline margins, glandular with stalked glands as well as pubescent with chaffy hairs: corollas tinged with pale purple, 8 mm. long, the tube exerted 1 or 2 mm. beyond the calyx, lobes 4 mm. long, 1 mm. wide, slightly narrowed above but not acute: stamens a trifle shorter than the corolla and colored like it, the round-elliptic anthers less than 1 mm. long: the

very slender style equalling but not exceeding the stamens, the stigmatic end not appreciably enlarged: capsule broadly ovoid-trigonal, almost globose, 3 mm. high and as broad: seeds yellowish, oblong, apparently narrowly winged. The flower characters and measurements from fresh flowers.

The type is no. 7868, collected May 29, 1905, at the river bridge near Redding, Shasta county California, in sand. It is of the *capitata* group, but differs from that species in its glabrous stems, in its pubescent and glandular calyx with lanceolate instead of ovate segments, in its blunt instead of acute corolla lobes, in its style equalling instead of shorter than the stamens, in its entire instead of 3-lobed style, and rounded instead of oval capsule. *Gilia capitata* of the Columbia river region has apparently not yet been found in California, what heretofore has passed as such being an aggregate of the species here described, together with *G. pallida* and *G. staminea*.

Gilia tenuisecta

Annual, branched from near the base, the branches ascending, 3 or 4 dm. long, glabrous or very faintly puberulent: leaves mostly basal, 6 or 7 cm. long, of oblong outline, cut into very narrow almost filiform divisions, slightly chaffy on the petioles; those of the stem few and scattered, soon reduced to a few short segments: peduncles slender, 10 cm. long or less: flowers capitate: calyx barely 3 mm. long, the ovate apiculate lobes 1 mm., membranous except for the broad green midvein, pubescent and ciliate with wavy chaffy hairs, as well as somewhat glandular: corollas violet blue about 6 mm. long, the lobes oblong, obtuse, 2 mm. long, over 1 mm. wide: stamens mostly colored like the petals and equalling them, the roundish, granular anthers about 1 mm. across: style equalling the stamens, split into three recurved lobes over 1 mm. long.

The type is no. 7898, collected May 30, 1905, on the banks of a stream about three miles northeast of Redding, Shasta county, California. It approaches *G. capitata* in its ovate calyx.

segments and three-lobed style, but differs in its smooth stems, very narrow leaf segments, blunt corolla lobes, longer stamens with granular anthers, and longer styles. Its heads and flowers are probably also much smaller. They are only about half the size of those of *G. glandulifera* described above, and about as large as those of *G. pallida*.

GILIA TRICOLOR Benth. Trans. Hort. Soc. II. 1: *pl.* 18. *f.* 3.
1835.

No. 7609, collected April 6, on the rising plain back of Kern, Kern county. It is very abundant in places on the plains about Bakersfield, imparting a purplish tinge to large areas. Here it is more diffuse, has paler and smaller flowers with the yellow more pronounced and the purple less so than in some specimens from the Bay region. It was described from plants sent to England by Douglas from Monterey.

GILIA LATIFLORA Gray, Syn. Fl. 2: Part 1, 147. 1878.

Gilia tenuiflora var. *latiflora* Gray, Proc. Am. Acad. 8:
278. 1870.

No. 7667, collected April 13, at Kramer, San Bernardino county, on the Mojave desert. This may be the typical form, as it is the maximum size, a foot or more high, nearly glabrous, with flowers an inch long and proportionately broad. It is apparently common on the desert, the type collected by Fremont, perhaps not far from Kramer.

No. 7686, collected April 14, on stony hills near Randsburg, Kern county. This is considerably smaller than no. 7667, has darker flowers only about half the size, and is more glandular. It grew at an elevation several hundred feet higher in stony ground instead of in sand.

No. 7837, collected May 5, at Tehachapi, Kern county, in grassy fields northwest of the town in rather rich soil, elevation 4000 feet, probably 800 feet higher than no. 7686, which it much resembles, only is decidedly glandular. Many of the flow-

ers show a tube but little longer than the calyx, due to the less advanced age of the flower. These smaller and darker flowered forms look unlike the larger one in the field, but no good characters appear upon which to separate them.

Gilia stellata

Annual: stems about 2 dm. high, sparingly branched above, the branches ascending, short, 5 cm. or less, glandular pubescent, especially below: leaves mostly basal in a rosette-like tuft, oblong, 5 cm. long, 1 cm. wide, pinnately divided into oblong divisions, which are cut into irregular pungently acute lobes, both faces beset with short white somewhat stellate hairs, the upper face greener than the lower; the few stem leaves short, the uppermost bract-like, pubescent like the basal ones: flowers somewhat crowded, mostly terminal on stoutish pedicels of 4 mm. or less: calyx narrowly campanulate, about 4 mm. high, membranous except for the broad green midvein which terminates in the narrowly lanceolate pungently acuminate lobes 1 mm. long: corollas funnel-form, exserted 6 mm. from the calyx when fully mature, the tube yellow at the base, above that purple dotted, the throat pale, the lobes pale violet or deep lavender, roundish obovate, 3 mm. long and nearly as wide, blunt, although somewhat narrowed at apex: stamens reaching to the corolla lobes; anthers roundish: pistil about 1 mm. shorter than the stamens, the stigma capitate, less than 1 mm. across.

The type is no. 7698, collected April 14, 1905, on stony hills near Randsburg, Kern county, California. It is a member of the *G. latiflora* group, and grew near one of the smaller flowered forms of that species, but at slightly higher elevations. It is readily distinguished by its peculiar pubescence and smaller paler flowers. It can hardly be referred to *G. latiflora cana* Jones, Cont. West. Bot. 8: 35. 1898, which is described: "leaves densely and permanently white-woolly. Flowers longer and paler."

GILIA INCONSPICUA (J. E. Smith) Sweet, Hort. Brit. 683.

Ipomopsis inconspicua J. E. Smith, Exot. Bot. *pl.* 14.

Cantua parviflora Pursh, Fl. **2**: 730. 1814.

Gilia parviflora Spreng. Syst. **1**: 626. 1825.

No. 7671, collected April 13, in sand at Kramer, San Bernardino county, in the Mojave desert. Though diffuse, the branches are ascending, and the leaves with narrow divisions. This is probably not *G. inconspicua*, which has been so confused in books and herbaria that one cannot tell what it really is without reference to the original.

No. 7791, collected April 28, on the high ridge west of McKittrick, Kern county, in open gravelly places. This is a prostrate plant with rather broad leaves, and is darker green than no. 7671, which it does not resemble very much.

LINANTHUS DICHOTOMUS Benth. Bot. Reg. **19**: under *pl.* 1622.
1833.

Gilia dichotoma Benth. DC. Prodr. **9**: 314. 1845.

No. 7690, collected April 14, at Randsburg, Kern county, on gravelly hills. It is a night blooming species, opening before dark and closing shortly after sunrise, the newly opened flowers fragrant. It is also abundant in the lower sandy places on the desert. All the plants from the southern part of the State appear to be diffusely branched, the edges of the petals marked with brown, while those from the northern coast counties are more simple, with fewer wholly white flowers.

LINANTHUS PARRYAE (Gray) Greene, Pittonia, **2**: 256. 1892.

Gilia Parryae Gray, Proc. Am. Acad. **12**: 76. 1876.

No. 7666, collected April 13, at Kramer, San Bernardino county, on the Mojave desert in sand. While this species belongs to another section, it much resembles *L. dichotomus* in its flower which opens in the morning some little time after those of the latter have closed. They vary in color from creamy white to blue. The type was from "desert plains near the head of the Mohave River."

LINANTHAUS PHARNACEOIDES (Benth.) Greene, Pittonia, **2**: 254. 1892.

Fenzlia pharnaceoides Benth. Bot. Reg. **19**: under *pl.* 1622. 1833.

Gilia pharnaceoides Benth. in DC. Prodr. **9**: 315. 1845.

Gilia liniflora var. *pharnaceoides* Gray, Proc. Am. Acad. **8**: 263. 1870.

No. 7749, collected April 22, at the foot of the bluffs opposite Oil City near Bakersfield, Kern county. The plant is plentiful at that place, the flowers blue when fresh, but fading to brownish. It is quite distinct from typical *L. liniflorus*, which has large white flowers, and is apparently confined to the region about San Francisco.

LINANTHUS FILIPES (Benth.) Greene, Pittonia, **2**: 255. 1892.

Gilia filipes Benth. Pl. Hartw. 325. 1849.

Gilia pusilla var. *Californica* Gray, Proc. Am. Acad. **8**: 263. 1870.

No. 7897, collected May 30, under shrubs on the banks of a stream about three miles northeast of Redding, Shasta county. The fresh flowers are lavender, with bright yellow throat and anthers. It is quite distinct from the inconspicuous flowered *L. pusillus*. The type came from "pascuis siccis vallis Sacramento, probably from near Chico.

LINANTHUS PARVIFLORUS (Benth.) Greene, Pittonia, **2**: 258. 1892.

Leptosiphon parviflorus Benth. Bot. Reg. **19**: under *pl.* 1622. 1833.

Gilia micrantha Steud. Nom.

No. 7840, collected May 15, along the road about a mile above Alma, Santa Clara county, growing on wet banks, the plants weak and spreading, the flower with a longer tube than usual.

LINANTHUS BREVICULUS (Gray) Greene, Pittonia, **2**: 259. 1892.

Gilia brevicula Gray, Proc. Am. Acad. **12**: 79. 1876.

Linanthus androsaceus var. *breviculus* Milliken, Univ. Cal. Pub. Bot. **2**: 57. 1904.

No. 7810, collected May 1, on the first ridge west of Keene Station in the Tehachapi mountains, Kern county. The fresh flowers were pale rose color or whitish. The type was collected "on the Mohave River, S. E. California, Dr. E. Palmer, 1876." Our plant may possibly be undescribed, as it does not quite answer to the description of the original.

LINANTHUS GRACIOSUS Milliken, Univ. Cal. Pub. Bot. **2**: 59. 1904.

No. 7787, collected April 28, on the high ridge west of McKittrick, Kern county, in rich loose soil, the flowers varying from pale purplish to yellow. It was abundant in a limited area. The type was collected by Miss Eastwood at "La Graciosa, Santa Barbara Co."

LINANTHUS BICOLOR (Nutt.) Greene, Pittonia, **2**: 260. 1892

Leptosiphon bicolor Nutt. Journ. Phila. Acad. II. **1**: 156. 1848.

Gilia tenella Benth. Pl. Hartw. 325. 1849.

No. 7809, collected May 1, on the first ridge west of Keene Station in the Tehachapi mountains, Kern county. The plants are taller and the flowers larger than in specimeus from the Bay region. Nuttall collected the type near Portland, Oregon.

LINANTHUS CILIATUS (Benth.) Greene, Pittonia, **2**: 260. 1892.

Gilia ciliata Benth. Pl. Hartw. 325. 1849.

No. 8040, collected June 15, on the first ridge west of Sisson, Siskiyou county, in gravel under oak trees. The type was from "in locis arenosis vallis Sacramento."

NAVARRETIA FILICAULIS (Torr.) Greene, Pittonia, **1**: 134. 1887.

Gilia filicaulis Torr. in Gray, Proc. Am. Acad. **8**: 270.
1870.

No. 8111, collected July 14, near Grass Valley, Nevada county, in gravelly ground under trees. The type was from "California, Jaffray, no. 1474, in herb. Kew." Apparently restricted to the foothills of the middle part of the State.

NAVARRETIA DIVARICATA (Torr.) Greene, Pittonia, **1**: 136. 1887.

Gilia divaricata Torr. in Gray, Proc. Am. Acad. **8**: 270.
1870.

No. 8112, collected July 14, near Grass Valley, Nevada county, on dry wooded slopes in gravel. It is a low wirey plant, the small corollas deep purple. The type came from "along the foothills of the Sierra Nevada," but the precise station not mentioned.

NAVARRETIA INTERTEXTA (Benth.) Hook. Fl. Bor. Am. **2**: 75.

1838.

Aegochloa intertexta Benth. Bot. Reg. **19**: under *pl.* 1622.
1833.

Gilia intertexta Steud. Nom. **1**: 683.

No. 7893, collected May 29, at the river bridge near Redding, Shasta county in sand, and plentiful. It was originally recorded from "California and North-West America."

HYDROPHYLLACEAE

PHACELIA AMMOPHILA Greene

No. 7613, collected April 7, at Caliente, Kern county, in sand. This resembles a specimen so named collected by C. F. Baker, at Antioch, Contra Costa county, April 28, 1903, no. 2806.

No. 7709, collected April 18, on slopes near Girard Station in the Tehachapi mountains, Kern county, in rich ground near shrubs, usually growing in thick masses, the elevation 3000 feet, or 1800 feet higher than the Caliente station.

PHACELIA TANACETIFOLIA Benth. Trans. Hort. Soc. II. **1**: 479.
1835.

No. 7635, collected April 8, along the bluffs of Kern river opposite Oil City, Kern county, on grassy slopes, the flowers deep violet blue.

No. 7695, collected April 14, on the desert about two miles north of Randsburg, Kern county, in sand. This plant is very abundant at intervals on the Mojave desert, forming great masses of color.

PHACELIA PLATYLOBA Gray, Proc. Am. Acad. **17**: 223. 1882.

No. 7745, collected April 22, at Oil City, Kern county, in sand in a ravine. This is much more hirsute and has larger flowers than the original, which was collected in Fresno county by Parry.

PHACELIA HISPIDA Gray, Syn. Fl. **2**: Part 1, 161. 1878.

Phacelia ramosissima var. *hispida* Gray, Proc. Am. Acad.

10: 319. 1875.

No. 7730, collected April 20, at Sunset, Kern county, on gravelly open slopes, growing in clumps, the large flowers pale purple with darker veins. Originally recorded from "Santa Barbara to San Diego."

No. 7611, collected April 7, at the first railroad crossing of the creek below Caliente, Kern county, on a steep bank in rich loose soil, the flowers white.

PHACELIA IMBRICATA Greene, Erythea, **1**: 127. 1893.

No. 7993, collected June 8, on the hills west of Yreka, Siskiyou county, in open gravelly places on a stream bank. Not heretofore reported from so far north, but the specimens agree fairly well with others from the type range, "on wooded hills of Napa and Sonoma counties."

PHACELIA HETEROPHYLLA Pursh, Fl. Am. Sept. **1**: 140. 1814.

No. 8080, collected in sandy ground along the railroad at Gazelle, Siskiyou county, June 20, the plants perhaps introduced. The type came from "dry hills on the banks of the Kooskoosky," or Clearwater river, Idaho.

PHACELIA LINEARIS (Pursh) Holzinger, Cont. U. S. Nat. Herb. **3**: 242. 1895.

Hydrophyllum lineare Pursh, Fl. Am. Sept. 134. 1814.

Eutoca Menziesii R. Br.; Richards. Bot. App. 764. *pl.* 27.

f. 1-5. 1823.

Eutoca heterophylla Torr. Stansbury's Rep. 393. 1852.

Phacelia Menziesii Torr.; Wats. Bot. King Rep. 252. 1871.

No. 8089, collected June 22, near Igerna, Siskiyou county, on sandy banks along the railroad. The species is widely distributed over the western part of the United States. The flowers are pale purple. Lewis collected the type "on the banks of the Missouri."

PHACELIA DAVIDSONII Gray, Proc. Am. Acad. **10**: 324. 1875.

No. 7585, collected April 5, on the sandy plain at Oil City, Kern county, where it is abundant, as it is all about Bakersfield in similar situations. It is a small depressed plant with lavender flowers, somewhat resembling *P. Douglasii*. The type was collected somewhere in Kern county.

PHACELIA CILIATA Benth. Trans. Linn. Soc. **17**: 280. 1837.

No. 7784, collected April 28, on the high ridge west of McKittrick, Kern county, in open gravelly spots, the plants low and wide spreading. The elevation is about 3000 feet, a somewhat high altitude for this species. The type was "from California. Mr. Douglas."

PHACELIA FREMONTII Torr. Ives Rep. 21. 1860.

No. 7687, collected April 14, at Randsburg, Kern county, on gravelly hills. It is abundant on the desert, where it was collected by Fremont. The flowers are deep violet-purple with yellow throat.

DRAPERIA SYSTYLA (Gray) Torr. Proc. Am. Acad, **7**: 401. 1867.
Nama systyla Gray, Proc. Am. Acad. **6**: 37. 1862.

No. 7966, collected June 5, a short distance below Shasta Springs, Siskiyou county. These specimens and one from Trinity county collected by Miss Eastwood, are less hirsute and more glandular, therefore greener looking than plants from the Yosemite region. The type locality is not given, merely "California, Lobb, no. 164."

EMMENANTHE PENDULIFLORA Benth. Trans. Linn. Soc. **17**:
 281. 1837.

No. 7697, collected May 1, near Keene Station in the Tehachapi mountains, Kern county, the plants small and diffuse. The type was "from Mr. Douglas's Californian collection."

ERIODICTYON CALIFORNICUM (H. & A.) Greene, Pittonia, **2**: 23.
 1889.

Wigandia ? Californica H. & A. Bot. Beech. 365. 1840.

No. 7996, collected June 8, on the hills west of Yreka, Siskiyou county, the leaves comparatively narrow and the glutinous calyx naked except for some bristle-like hairs on the margin. Douglas got the type in the middle coast region.

ERIODICTYON LOBBII (Gray) Greene, Bull. Cal. Acad. **1**: 202.
 1886.

Nama Lobbii Gray, Proc. Am. Acad. **7**: 37. 1866.

No. 8050, collected June 16, back of Sisson near the Mt. Shasta trail in sand, the plants prostrate. In appearance it resembles the other plants described as *Nama*, except that it is lignescent.

CONANTHUS DEPRESSUS Lemmon, in Heller, Cat. N. A. Pl. 6.
 1898.

Nama depressum Lemmon; Gray, Proc. Am. Acad. **20**:
 304. 1885.

No. 7701, collected April 14, on gravelly hills near Randsburg, Kern county, where it is abundant. The type is from the

Calico mine, somewhere in the Mojave desert, perhaps at no great distance from our station.

NEMOPHILA MICRANTHA Eastw. Bull. Torr. Club, **28**: 146.
1901.

No. 7925, collected June 1, in rich soil under trees near Dunsinuir, Siskiyou county, the plants small. The type is from Marin county, and the species has not been reported from so far inland, previously recorded only from the coast region within the limit of redwood growth.

MACROCALYX MEMBRANACEUS (Benth.) Kuntze, Rev. Gen. Pl.
2: 434. 1891.

Ellisia membranacea Benth. Trans. Linn. Soc. **17**: 274.
1837.

No. 7612, collected April 7, at the first railroad crossing of the creek below Caliente, Kern county, growing in rich loose soil. It is abundant in the vicinity, and was mistaken for a *Nemophila*. The capsule is hard and crustaceous, beset with sharp points.

BORRAGINACEAE

PECTOCARYA LINEARIS (R. & P.) DC. Prod. **10**: 120. 1846.

Cynoglossum lineare R. & P. Fl. Peruv. **2**: 6. 1799.

No. 7586, collected April 5, on the sandy plain at Oil City near Bakersfield, Kern county. The plant is plentiful in that region. The type was from Chili.

CYNOGLOSSUM OCCIDENTALE Gray, Proc. Am. Acad. **10**: 58.
1874.

No. 7984, collected June 5, on the plateau above Shasta Springs, Siskiyou county, where it is rather plentiful in sandy soil in the woods. The type was from the "Sierra Nevada, in the northeastern part of California, Rev. Mr. Burgess, and Sierra County, J. G. Lemmon."

ALLOCARYA CALIFORNICA (F. & M.) Greene, Pittonia, **1**: 20.
1887.

Myosotis Californica F. & M. Ind. Sem. Petrop. **2**: 42.
1835.

Eritrichium Californicum DC. Prodr. **10**: 130. 1846.

Krynitzkia Californica Gray, Proc. Am. Acad. **20**: 264.
1885.

No. 7891, collected May 29, at the river bridge near Redding, Shasta county, in sand, the plants prostrate. The type was grown from seeds collected at Fort Ross, Sonoma county.

ALLOCARYA STIPITATA Greene, Pittonia, **1**: 19. 1887.

No. 7908, collected May 30, in wet places along a small stream about three miles east of Redding, Shasta county, where it was abundant. Originally from somewhere in the lower Sacramento valley.

PIPTOCALYX CIRCUMSCISSUS (H. & A.) Torr. U. S. Expl. Exped.

17: 414. *pl. 12. B.* 1874.

Lithospermum ? circumscissum H. & A. Bot. Beech. 370.
1840.

Eritrichium circumscissum Gray, Proc. Am. Acad. **10**: 58.
1874.

Krynitzkia circumscissa Gray, Proc. Am. Acad. **20**: 275.
1885.

No. 7764, collected April 24, in sand on the desert about three miles southwest of Mojave, Kern county. It is a widely diffused species, the type from "Snake Fort, Snake country," collected by Tolmie.

SONNEA HISPIDA (Gray) Greene, Pittonia, **1**: 22. 1887.

Plagiobothrys hispida Gray, Proc. Am. Acad. **20**: 286.
1885.

No. 8053, collected June 17, along the railroad about a mile below Sisson, Siskiyou county, in sand. Apparently not found before in this part of the State. The type was collected at Truckee, on the east side of the Sierra.

PLAGIOBOTHRYUS CANESCENS APERTUS Greene, Pittonia, **1**: 21.
1887.

No. 7758, collected April 24, on a low gravelly ridge on the desert about three miles southwest of Mojave, Kern county. Our specimens have the habit and rather harsh pubescence of this plant. The type came from the "plains of the upper San Joaquin."

PLAGIOBOTHRYUS COOPERI Gray, Proc. Am. Acad. **20**: 285.
1885.

Eritrichium Cooperi Gray, Proc. Am. Acad. **19**: 89. 1883.

No. 7646, collected April 11, on the edge of the plain two miles west of Pampa Station, Kern county, in sand. It appears to be more leafy than the original, which came from the "Mohave Desert, S. E. California, at Camp Cady."

PLAGIOBOTHRYUS NOTHOFULVUS Gray, Proc. Am. Acad. **20**:
285. 1885.

Eritrichium nothofulvum Gray, Proc. Am. Acad. **17**: 227.
1882.

No. 7618a, collected April 7, a short distance east of Caliente, Kern county, in grassy fields, the pubescence of the calyx whitish.

No. 7720, collected April 18, on grassy slopes near Girard Station in the Tehachapi mountains, the pubescence of the calyx tawny.

CRYPTANTHE AFFINIS (Gray) Greene, Pittonia, **1**: 119. 1887.

Krynitzkia affinis Gray, Proc. Am. Acad. **20**: 270. 1885.

No. 7642, collected April 11, on a sand hill near Pampa Station, Kern county, where it was abundant. The nutlets are grey, smooth and shining.

No. 7995, collected June 8, in loose soil on the hills west of Yreka, Siskiyou county, the plants tall, much branched above.

CRYPTANTHE GEMINATA Greene, Pittonia, **1**: 119. 1887.

No. 7962, collected June 5, a short distance below Shasta Springs, Siskiyou county, along the railroad. Not heretofore reported except from near Truckee, Nevada county, the type locality.

CRYPTANTHE FLACCIDA (Lehm.) Greene, Pittonia, **1**: 115. 1887.

Myosotis flaccida Lehm. Pugill. **2**: 22. 1830.

Eritrichium oxycaryum Gray, Proc. Am. Acad. **10**: 58.
1874.

Krynitzkia axycarya Gray, Proc. Am. Acad. **20**: 268.
1885.

No. 7625, collected April 7, in grassy fields a short distance east of Caliente, Kern county. The species is widely distributed.

CRYPTANTHE AMBIGUA (Gray) Greene, Pittonia, **1**: 113. 1887.

Eritrichium muriculatum var. *ambiguum* Gray, Syn. Fl. **2**: Part 1, 194. 1878.

Krynitzkia ambigua Gray, Proc. Am. Acad. **20**: 273. 1885.

No. 7883, collected May 29, at the river bridge near Redding, Shasta county, in gravel and sand. The type came from "Nisqually, Washington Territory."

CRYPTANTHE BARBIGERA (Gray) Greene, Pittonia, **1**: 114. 1887.

Eritrichium barbigerum Gray, Syn. Fl. **2**: Part 1, 194.
1878.

Krynitzkia barbigerum Gray, Proc. Am. Acad. **20**: 272.
1885.

No. 7645, collected April 11, at the base of the low hills two miles west of Pampa Station, Kern county, in sandy soil. The range as originally given is "S. California, from Santa Barbara Co. so S. Utah and Arizona."

CRYPTANTHE INTERMEDIA (Gray) Greene, *Pittonia*, **1**: 114.
1887.

Eritrichium intermedium Gray, Proc. Am. Acad. **17**: 225.
1882.

Krynitzkia intermedia Gray, Proc. Am. Acad. **20**: 273.
1885.

No. 7788, collected April 28, on the high ridge west of McKittrick, Kern county, in open places, the plants low and rather spreading. The type was from the "southern part of California (from Los Angeles, *Nevin*, &c.) to adjacent Arizona."

No. 8035, collected June 15, near the summit of the first ridge west of Sisson, Siskiyou county, in grassy open places in coniferous forest. The plants were tall and rather slender.

CRYPTANTHE PTEROCARYA (Torr.) Greene, *Pittonia*, **1**: 120.
1887.

Eritrichium pterocaryum Torr. U. S. Expl. Exped. **17**:
415. 1874.

Krynitzkia pterocarya Gray, Proc. Am. Acad. **20**: 276.
1885.

No. 7668, collected April 13, at Kramer, San Bernardino county, in sand, where it is rather common. This species is mentioned but hardly described, in Bot. Mex. Bound. 142. 1859. The type was collected on the "Walla-Walla River, Washington Territory."

CRYPTANTHE CYCLOPTERA Greene, *Pittonia*, **1**: 120. 1887.

Krynitzkia cycloptera Greene, Bull. Cal. Acad. **1**: 207.
1886.

No. 7789, collected April 24, on the high ridge west of McKittrick, Kern county, in open places in rich ground. The type was from Tucson, Arizona, and one would not expect it in the southern Coast Range.

AMSINCKIA VERNICOSA H. & A. Bot. Beech. 370. 1840.

No. 7722, collected April 20, at Sunset, Kern county, on gravelly hills. This species is of peculiar aspect when fresh, the leaves coriaceous, blue-green in color and of a smooth appearance. Douglas no doubt got the type somewhere to the south of Monterey, since it has not been found that far north, and is rarely collected.

AMSINCKIA TESSELLATA Gray, Proc. Am. Acad. **10**: 54 1874.

No. 7670, collected April 13, at Kramer, San Bernardino county, in sand, and plentiful. It is a tawny hispid plant with rather small flowers. The type came from "Contra-Costa Mountains near Monte Diablo."

AMSINCKIA INTERMEDIA F. & M. Ind. Sem. Petrop. **2**: 26.
1835.

No. 7648, collected April 11, two miles west of Pampa Station on the edge of the low hills bordering the plain in sandy soil. The plants have rather thin leaves and small pale flowers. The type was grown from seed sent from Bodega Bay, Sonoma county.

AMSINCKIA SPECTABILIS F. & M. Ind. Sem. Petrop. **2**: 26.
1835.

No. 7618, collected April 7, in grassy places a short distance east of Caliente, the large flowers bright orange. The type was grown from seeds from Bodega Bay, Sonoma county.

LITHOSPERMUM CALIFORNICUM Gray, Proc. Am. Acad. **10**: 51.
1874.

No. 8017, collected June 13, on the slope between the railroad and the river above Shasta Springs, Siskiyou county, near shrubs. The type was from "Grass Valley, California, Dr. Bigelow."

HELIOTROPIACEAE

HELIOTROPIUM OCULATUM Heller, Muhlenbergia, **1**: 58. 1904.

No. 8064, collected June 19, along the railroad near Grenada Station, Siskiyou county. The species is widely scattered through the interior of California, often in soil which contains little alkali. The flowers are whitish or lilac with a purple eye. The type was collected at Healdsburg, Sonoma county, on the banks of the Russian river in gravel and sand.

LAMIACEAE

SCUTELLARIA AUSTINAE Eastw. Bull. Torr. Club, **30**: 493.
1903.

No. 7889, collected May 29, at the river bridge near Redding, Shasta county, in gravel and sand. It is a handsome species, the rather large flowers deep violet-blue. The type was collected on Big Chico creek, Butte county. In this connection it may be well to state that *S. angustifolia* Pursh has not yet been detected in California, and probably never will. It is a species found in northern Idaho and eastern Washington. My own 3150, collected near type locality in 1896 is typical, and those who have access to it should readily see why none of the Californian plants belong there.

SCUTELLARIA ANTIRRHINOIDES Benth. Bot. Reg. **18**: under *pl.*
1493. 1832.

No. 8020, collected June 13, on wooded slopes in the gorge of the Sacramento above Shasta Springs, Siskiyou county. It has rather small pale violet-blue flowers, and although like other specimens labeled *S. antirrhinoides*, differs somewhat from the original which was collected on the Columbia "prope arcem Vancouver," by Scouler.

SCUTELLARIA NANA Gray, Proc. Am. Acad. **11**: 100. 1876.

No. 8086, collected June 22, near Igerna, Siskiyou county, in sandy open places. The type was from "N. W. Nevada, in

Winnemucca Valley, near Pyramid Lake, J. G. Lemmon." The fresh flowers are cream color. It has also been collected on the Madeline Plains, Plumas county.

STACHYS CALIFORNICA Benth. DC. Prodr. **12**: 469. 1848.

No. 7918, collected in wet places near Middle Creek Station, Shasta county. Referred here until better opportunity for study is afforded.

SALVIA CARDUACEA Benth. Lab. 302. 1833.

No. 7651, collected April 11, on the edge of the plain two miles west of Pampa Station, Kern county, in sandy soil. The large and showy flowers are lavender color. A plant of economic importance among the Indians, known as Chia.

SALVIA COLUMBARIÆ Benth. Lab. 302. 1833.

No. 7643, collected April 11, on gravelly hills along the railroad one mile west of Pampa Station, Kern county. It is widely distributed in the lower two-thirds of California.

RAMONA HUMILIS (Benth.) Greene, Erythea, **1**: 144. 1893.

Audibertia humilis Benth. Lab. 313. 1836.

Salvia Sonomensis Greene, Pittonia, **2**: 236. 1892.

No. 8044, collected June 14, back of Sisson, Siskiyou county, on the Mt. Shasta trail, in sandy soil, not uncommon. It occurs almost throughout California, and is common on some of the mountains of the north Coast Range.

MONARDELLA SHELTONI Torr. in Durand, Journ. Acad. Phila.

II. **3**: 99. 1855.

No. 8113, collected July 14, along Deer Creek near Nevada City, Nevada county, on somewhat open slopes with a scattered growth of pine. The leaves are described as "subobtuse," but often vary to decidedly acute. From type locality.

MONARDELLA LANCEOLATA Gray, Proc. Am. Acad. **11**: 102. 1876.

No. 8114, collected July 14, on the banks of Deer Creek near Nevada City, Nevada county, on dry grassy slopes near pine trees, the flowers rose purple. The type range is "California, from Plumas to San Diego Co."

MONARDELLA OVATA Greene, Pittonia, **5**: 82. 1902.

No. 8018, collected June 13, on wooded slopes in the gorge of the Sacramento above Shasta Springs, Siskiyou county. It is from type region "near Sisson," but the leaves vary to lanceolate. The type number, H. E. Brown's 381, shows this same variation, the leaves on some of the specimens being quite narrow. The broad leaved typical form was evidently collected in moister more shaded places. The writer has both forms in his herbarium.

SOLANACEAE

LYCIUM FREMONTII Gray, Proc. Am. Acad. **6**: 46. 1862.

No. 7704, collected April 14, at Randsburg, Kern county, on stony hillsides. A low shrub with numerous stiff spiny branches. Fremont collected the type in the "interior of California or country east of it."

SOLANUM XANTI Gray, Proc. Am. Acad. **11**: 90. 1875.

No. 7706, collected at Girard Station in the Tehachapi mountains, Kern county, growing in thick rounded clumps. The type was collected at Fort Tejon, Kern county.

Solanum Parishii

Solanum Xanti glabrescens Parish, Proc. Cal. Acad. III. Bot. **2**: 169. 1901; not *S. rufescens* var. *glabrescens* Sendt ["*S. glabrescens* Schrank Mss."] in Mart. Fl. Bras. **10**: 39.

No. 7899, collected May 30, in a meadow about three miles northeast of Redding, Shasta county. This particular form has

narrowly lanceolate, sharply acute leaves, the calyx segments bluntish. Now after having seen true *S. xanti* in the field, the writer feels no hesitation in separating this tall glabrescent form with erect or ascending wand-like branches. Even as it now stands it is an aggregate so far as the shape of leaf and calyx segments is concerned, but the several forms noted in the field during the past few years have the same habit. It is probably the same as *S. umbelliferum* var. *glabrescens* Torr. Pac. R. R. Rep. 7: 17. 1856, which was collected at "Santa Inez; also between San Bernardino and San Gabriel." Mr. Parish was apparently unaware of this earlier published homonym.

SCROPHULARIACEAE

COLLINSIA LINEARIS Gray, Proc. Am. Acad. 15: 50. 1879.

No. 7946, collected June 1, near Shasta Retreat, Siskiyou county, in rich soil on wooded slopes, not uncommon. The type was from "along the Klamath and Trinity Rivers, on argillaceous-rocky hills, N. W. California."

COLLINSIA BICOLOR Benth. Trans. Hort. Soc. II. 1: 480. 1835.

No. 7769, collected April 26, about a mile inside of Kern canyon, Kern county, on steep northerly slopes. This does not look quite like the plant from Monterey where Douglas undoubtedly collected the type, being smoother in the inflorescence and having narrower leaves.

SCROPHULARIA CALIFORNICA Cham. Linnaea, 2: 585. 1827.

No. 7714, collected April 18, at Girard station in the Tehachapi mountains, Kern county. This is a stout glabrous plant, not much branched, with large brownish flowers. It is from an altitude of 3000 feet, in moist places on open slopes. The type was collected at San Francisco, where it occurs in moist sandy soil.

No. 7767, collected April 26, about a mile inside the mouth of Kern canyon, Kern county, the plants remarkably widely much branched, pubescent and glandular, the flowers maroon.

No. 8059, collected June 17, on the banks of the Sacramento west of Sisson, Siskiyou county, the plants stout, little branched, the leaves pale, the flowers large, greenish yellow.

PENTSTEMON NEWBERRYI Gray, Pac. R. R. Rep. **6**: 82. 1857.

Pentstemon Menziesii var. *Newberryi* Gray, Proc. Am. Acad. **6**: 56. 1862.

No. 8048, collected June 16, back of Sisson Siskiyou county, near the Mt. Shasta trail where it is very abundant, growing in great masses about rocks. One of the most ornamental species, the flowers deep crimson. The type was from "near Mt. St. Joseph's, N. California."

PENTSTEMON DEUSTUS Dougl.; Lindl. Bot. Reg. **16**: *pl.* 1318. 1830.

No. 7998, collected June 8, on dry hills at Yreka, Siskiyou county, near stones and rocks, the plants scattered and rather slender. A "native of North-west America, where it was found by Mr. Douglas on scorched, rocky plains, in the interior."

No. 8049, collected June 16, back of Sisson, Siskiyou county, near the Mt. Shasta trail growing profusely about rocks, the plants diffuse, growing in dense mats with a decidedly woody stem.

PENTSTEMON CUSICKII Gray, Proc. Am. Acad. **16**: 106. 1881.

No. 8009, collected June 9, in a field about a mile east of Montague, Siskiyou county, the stems slender, erect.

PENTSTEMON GLAUCIFOLIUS Gray, Pac. R. R. Rep. **6**: 82. 1857.

No. 7867, collected May 26, at the river bridge near Redding, Shasta county, in gravel and sand. It is from type locality, and not uncommon at different points along the river near Redding. The sterile filament of the type is sparingly bearded, but glabrous in our specimens so far as examined. However, if this character is inconstant, there are vegetative characters suf-

ficient to keep it distinct from *P. azureus* with which it has been merged.

PENTSTEMON AZUREUS Benth. Pl. Hartw. 327. 1849.

No. 8115, collected July 14, near Grass Valley, Nevada county, in open moist places bordering meadows. The plant is somewhat glaucous, and has lanceolate acuminate calyx lobes. The type was from "in annibus exsiccatis vallis Sacramento."

PENTSTEMON ROEZLI Regel, Act. Hort. Petrop. 2: 326.

No. 8019, collected June 13, on wooded slopes in the gorge of the Sacramento above Shasta Springs, Siskiyou county. The plants are more woody at base and taller than certain other specimens, but appear to belong with this species.

Pentstemon piliferus

Herbaceous perennial: stems several from a tough woody rootstock, 5 or 6 dm. high, glabrous, leafy: leaves glabrous, coriaceous, the basal ones obovate or spatulate, obtuse, 6 or 7 cm. long, the blade 2-2.5 cm. wide, tapering into the petiole 2 or 3 mm. wide which nearly equals the blade and is dilated at base; lowest pair of stem leaves about 1 dm. long, lanceolate, somewhat narrower but petioled like the basal ones, the next pair oblong, sessile and merely a little narrowed below, those above sessile, lanceolate, gradually becoming shorter and narrower until they appear as bracts in the inflorescence: thyrsus elongated, about 2 dm. long containing about six whorls of flowers, which are deep violet-blue: peduncles rather slender, 1 cm. long or less: pedicels 5 mm. long or less: calyx when in flower about 6 mm. long with no proper tube, the lobes ovate-lanceolate and acuminate, 3 mm. wide at base, the hyaline edges somewhat uneven: corollas 3 cm. long, ventricose ampliate above, 2 cm. across the slightly bilabiate top, the lobes 7 mm. long and as wide: anthers with diverging cells dehiscent from base to but not through the apex, the margins slightly hispid; sterile filament slightly dilated at the apex, where it is bearded on the in-

side with a dense tuft of yellow hairs, whence the specific name.

The type is no. 7991, collected June 8, 1905, on hills west of Yreka, Siskiyou county, California, growing on the banks of a small stream. It is one of the *P. glaber* aggregates, but is clearly distinct from that species, the type of which came from the region lying east of the Rocky mountains known in those days as "Upper Louisiana." Pursh describes it as "filamento sterili nudo clavato apice retuso, calycis foliolis subrotundis acuminatis."

A plant similar to ours was collected by Mr. or Mrs. Brandegee at Klamathon, some miles northeast of Yreka. Careful field study of our so-called *P. glaber* will no doubt show that we have several distinct species in California, and that true *glaber* does not occur here.

DIPLACUS LATIFOLIUS Nutt. Ann. and Mag. Nat. Hist. 1: 137.
1838.

No. 7771, collected April 26, about a mile inside of Kern canyon, Kern county, the plants growing in clumps and very showy with the profusion of large buff flowers. It is common in the Tehachapi mountains on steep northerly slopes in damp places.

MIMULUS LANGSDORFFII Sims, Bot. Mag. under *pl. 1501*. 1812.
Mimulus guttatus DC. Cat. Monsp. 117. 1813.

No. 7838, collected May 6, at Bakersfield, Kern county, where it is not uncommon along irrigating ditches. Whether this is really the same as the plant from Unalaska, the writer has no means of determining, not having the original diagnosis at hand, and Professor Greene in his paper in the Journal of Botany, January, 1895, does not point out the distinguishing characters. This particular form is a rather stout plant with rounded hollow stem, glabrous except in the extreme upper part of the inflorescence, where it is both pubescent and glandular.

No. 8027, collected June 13, in wet places near Shasta Springs, Siskiyou county. The calyx approaches that of *M. nasutus* in shape, but the other characters are different. A proper understanding of this group of plants can be had only by study in the field, and accurate illustrations of fresh flowers should be made.

No. 7858, collected May 26, about two miles west of Redding, Shasta county, in wet places near a small stream. This is probably an undescribed species, having some of the characters of both *M. nasutus* and *M. glaucescens*. For the benefit of those who look with favor upon natural hybrids, we would state that it appears to be the only form in the vicinity.

MIMULUS MOSCHATUS Dougl.; Lindl. Bot. Reg. **13**: pl. 1118. 1827.

No. 7960, collected June 5, a short distance below Shasta Springs, Siskiyou county on a wet clay bank. The type was "found growing sparingly on the margins of springs in the country about the river Columbia, in North-West America."

MIMULUS PULSIFERAE Gray, Proc. Am. Acad. **11**: 98. 1875.

No. 7961, collected June 5, in dry ground near Shasta Springs, Siskiyou county. The type from "California, in the Sierra and Indian Valleys of the Sierra Nevada." Our plant is not typical.

EUNANUS TORREYI (Gray) Greene, Bull. Cal. Acad. **1**: 104. 1885.

Mimulus Torreyi Gray, Proc. Am. Acad. **11**: 97. 1875.

No. 7963, collected June 5, a short distance below Shasta Springs, Siskiyou county, not uncommon at intervals along the railroad. The type from Donner Lake, where it is abundant, collected by Torrey.

GRATIOLA EBRACTEATA Benth. DC. Prodr. **10**: 595. 1846.

No. 7907, collected May 30, in wet muddy places along a small stream about two miles east of Redding, Shasta county. The type from "in planitiebus terrae Oregon," collected by Nuttall.

CASTILLEJA CANDENS Dur. & Hilg. Pac. R. R. Rep. **5**: 12. 1855.

No. 7811, collected May 1, near Keene Station in the Tehachapi mountains, Kern county. The type was collected on Pose creek, Kern county, probably a fragment of a plant. Our plant does not agree in some particulars with the original.

CASTILLEJA DOUGLASII Benth. in DC. Prodr. **10**: 530. 1846.

Castilleia parviflora var. *Douglasii* Jepson, Fl. W. M. Cal. 412. 1901.

No. 7878, collected May 27, near Redding, Shasta county, on banks under shrubs, the leaves and their divisions narrow, the long scarlet floral bracts mostly acute. The type was from "Nova California," collected by Douglas.

No. 8033, collected June 15, near the summit of the first ridge west of Sisson, Siskiyou county, in open grassy places in pine woods. This form has rather broad leaves.

Castilleja pratensis

Perennial, somewhat tufted, hispid throughout with short chaffy wavy hairs which are softer in the inflorescence, the stems and leaves greyish: stems 2-2.5 dm. high, simple or with several erect branches above: leaves narrow, about 3 cm. long, the lowermost linear, entire, 1 or 2 mm. wide, those on the middle part of the stem 3 mm. wide, cut above into about three linear ascending lobes: inflorescence occupying the upper half of the stem, the bracts and flowers pale yellow: bracts 2.5 cm. long, the lower half oblong, 5 mm. wide, above that widened to 8 or 10 mm. by the spreading of the five lobes, the two lateral pairs

linear, very narrow, barely 1 mm. wide, the outer pair 6 mm long, the inner 3 mm., the terminal and longest one broad and rounded, 3 mm. long and nearly as wide: calyx 15 mm. long, about equally cleft before and behind, the segments 6 mm. long, narrowly linear, less than 1 mm. wide: corolla 17 or 18 mm. long, narrow, about 2 mm. across at base 3 mm. at the top, the lower lip 3-cleft into linear divisions 2 mm. long, the upper lip erect, acute, 2 mm. longer than the lower one; base obscurely saccate.

The type is no. 8079, collected June 20, 1905, at Gazelle, Siskiyou county, California, in moist meadows. Its nearest relative seems to be *C. pilosa* the type of which was collected in "Washoe Valley, Nevada," but our plant differs from that in having a longer flower, the calyx not "cleft nearly to the base anteriorly." Its pubescence is also harsher, the leaves more coriaceous and narrower, and the floral bracts with more numerous narrower lobes.

ORTHOCARPUS ATTENUATUS Gray, Pac. R. R. Rep. 4: 121.
1857.

No. 7580, collected March 22, at Marysville Buttes, Sutter county, along the base of the ridge opposite South Butte. The type was from Corte Madera, Marin county.

No. 7817, collected May 1, on grassy slopes near Keene station in the Tehachapi mountains, Kern county, the elevation at least 2500 feet. It is widely distributed in California, occurring at least as far north as the foothills of Butte county.

ORTHOCARPUS BROWNII Eastw. Bull. Torr. Club, 32: 210.
1905.

No. 7909, collected May 30, on grassy banks near a small stream about three miles east of Redding, Shasta county. It is a handsome yellow flowered species with purplish blue stems, and is no doubt common on the low hill bordering the upper Sacramento valley. The type is the writer's no. 5459, collected on grassy slopes near Clear Creek Post Office, Butte county.

ORTHOCARPUS BIDWELLIAE Gray, Proc. Am. Acad. **15**: 51
1879.

No. 7566, collected March 21, in low and rather moist clayey soil at Marysville, Sutter county. It is a pretty species with bright yellow and purple flowers. The type was collected "near Chico, Mrs. John Bidwell."

ORTHOCARPUS PURPURASCENS Benth. Scroph. Ind. 13.

No. 7601, collected April 6, on the plains back of Kern, Kern county, the plants small. This plant is plentiful at intervals about Bakersfield, becoming quite large under favorable conditions. Known locally as "Indian pink."

No. 7735, collected April 20, at Sunset, Kern county, plentiful on hillsides.

ORTHOCARPUS EXSERTUS Heller, Muhlenbergia, **1**: 109. 1904.

Specimens from type locality, collected by Geo. B. Grant at Lincoln Park near Pasadena, Los Angeles county, April, 1905.

Orthocarpus venustus

Annual, about 2 dm. high, the mostly purplish stems pubescent with short spreading hairs, leafy and more or less branched from near the base: leaves all sessile, the lowest sometimes approximate at the base, 6 cm. or less, narrow, 2-3 mm., cut into several distant and divaricate lobes, these sometimes very narrow, almost filiform: floral bracts 15 to 20 mm. long, somewhat cuneiform, about 6 mm. wide at base, 10 to 15 mm. across the top, usually but not always exceeding the flower, greenish and hirsute at base, red-purple in the middle, the tips pale purple, or sometimes all but the tips green, the two pairs of lateral lobes linear, 1 mm. wide, slightly enlarged at the end, the terminal one cuneate, 2 mm. wide at base, 3-lobed: calyx equalling the bracts, the four linear lobes equal, marked like the bracts: corolla deep crimson, pubescent on the lower part with

short straight hairs, broadly club-shaped, gradually enlarged from 2 mm. at the base to 6 or 7 mm. near the top, the folds at the top edged for a depth of 2 mm. with bright yellow, the middle fold 2 mm. broad, with a slight concavity, the lateral ones narrower, each raised into a narrow ridge; the minute white slender teeth less than 1 mm. long; the pale purple galea erect, extending 2 or 3 mm. above the other parts, densely bearded.

The type is no. 7677, collected April 13, 1905, at Kramer, San Bernardino county, California, in the Mojave desert in sand. It was first noticed from the train some distance east of Mojave, its peculiar dark purple aspect at once marking it as something new. A single plant was found on the desert just north of Randsburg, and it had been brought in from a mining camp nine miles north of Randsburg, showing that it is not uncommon in the western part of the Mojave desert. It is one of our handsomest species, related to *O. purpurascens*.

OROBANCHACEAE

THALESIA FASCICULATA (Nutt.) Britton, Mem. Torr. Club, 5: 298. 1894.

Orobanche fasciculata Nutt. Gen. 2: 59. 1818.

Anoplanthus fasciculatus Walp. Rep. 3: 480. 1844-45.

Aphyllon fasciculatum Gray, Syn. Fl. 2: Part 1, 312. 1878.

No. 7954, collected June 3, in sand near Middle Creek station, apparently parasitic on grass, a large number of plants at this place. Originally from "sandy alluvial soils, around Fort Mandan," North Dakota.

PLANTAGINACEAE

PLANTAGO SHASTENSIS Greene, Pl. Baker. 3: 32. 1901.

No. 8078, collected June 20, at Gazelle, Siskiyou county, in moist meadows, where it is not uncommon. From type locality, "plains of Shasta River in Northern California."

PLANTAGO ERECTA Morris, Bull. Torr. Club, **27**: 118. 1900.

Plantago Patagonica var. *Californica* Greene, Manual, 236.

1894; not *P. Californica* Greene, Bull. Cal. Acad. **1**: 123.
1885.

No. 7565, collected March 21, at Marysville, Sutter county, in moist clay soil, the plants slender. Its range was given as "abundant on grassy plains and hillsides," meaning in the Bay region of San Francisco. It occurs as far north as Butte county at least, and grows in various kinds of soil, as for instance in sand about Pacific Grove.

No. 7582, collected March 22, at the Marysville Buttes, Sutter county, in stony ground on the ridge east of South Butte. These plants are dwarfed, have a reddish tinge, and short stout flowering spikes.

No. 7819, collected May 1, in grassy meadows near Keene station in the Tehachapi mountains, Kern county. This also is a stout form and does not look much like the extreme slender ones.

PLANTAGO SCARIOSA Morris, Bull. Torr. Club, **27**: 117. 1900.

Plantago minima Cunningham, Proc. Ind. Acad. 1896: 202.

1897; not *P. minima* DC. 1805.

No. 7589, collected April 5, on the sandy plain at Oil City near Bakersfield; Kern county. The species is very abundant in that region, the plants depressed and lying close to the ground.

No. 7694, collected April 14, on low gravelly hills in the desert about two miles north of Randsburg, Kern county.

RUBIACEAE

GALIUM ANGUSTIFOLIUM Nutt.; T. & G. Fl. N. A. **2**: 22. 1841.

No. 7775, collected April 26, about a mile within Kern canyon, Kern county, on steep northerly slopes, the plants with long somewhat woody stems, much branched and diffuse. Nuttall collected the type at San Diego.

GALIAM VAILLANTII DC. Fl. France, 4: 263. 1805.

Galium Aparine var. *Vaillantii* Koch, Fl. Germ. 330. 1837.

No. 7952, collected June 3, along the railroad near Middle Creek station, Shasta county, not plentiful. The plants are depressed and spreading.

GALIAM BOLANDERI Gray, Proc. Am. Acad. 7: 350. 1867.

No. 8034, collected near the summit of the first ridge west of Sisson, Siskiyou county, June 15, growing in open grassy places in pine woods. The type was from the "Sierra Nevada, on the Mono Trail."

GALIAM PUBENS Gray, Proc. Am. Acad. 7: 350. 1867.

No. 7864, collected May 26, on the hills about two miles west of Redding, Shasta county, occurring in two forms; one with many short branches and narrow leaves, the other with longer stems, few branches and broader leaves. It grew on dry stony ridges near shrubs. The type was from "Yosemite Valley and adjacent mountains."

CAPRIFOLIACEAE

SAMBUCUS VELUTINA Dur. & Hilg. Pac. R. R. Rep. 5: 8. 1855.

No. 7744, collected April 22, in a sandy ravine at Oil City, Kern county. An arborescent shrub about eight feet high. The type was collected on Pose creek, some miles north of Oil City.

SYMPHORICARPOS RACEMOSUS Michx. Fl. 1: 107. 1803.

No. 8022, collected in moist places along the railroad a short distance above Shasta Springs, Siskiyou county. An upright shrub four or five feet high. The type came from "in montanis, ad lacus *Mistassins*," Canada.

SYMPHORICARPOS MOLLIS Nutt.; T. & G. Fl. N. A. 2: 4. 1841.

No. 7985, collected June 5, in sandy open woods above Shasta Springs, Siskiyou county, the branches two feet or more long, depressed. The type came from "St. Barbara."

LINNAEA AMERICANA Forbes, Hortus Woburnensis, 135. 1833.

No. 8056, collected June 17, in deep moist woods near the Sacramento river west of Sisson, Siskiyou county. Our plant is said to be distinct from the European *L. borealis*.

LONICERA INTERRUPTA Benth. Pl. Hartw. 313. 1849.

Lonicera hispidula var. *interrupta* Gray, Proc. Am. Acad.
8: 627. 1870.

No. 7881a, collected May 27, on banks near Redding, Shasta county. A rather stiff low twining woody plant, the type of which came from "juxta fl. Carmel prope Monterey." Although not agreeing in all particulars, our plant comes nearer this species than to the others.

VALERIANACEAE

PLECTRITIS SAMOLIFOLIA (DC.) Hoeck. in Engler, Jahrb. 3:
37.

Betckea samolifolia DC. Prodr. 4: 642. 1830.

No. 7801, collected May 1, on a grassy ridge near Keene station in the Tehachapi mountains, Kern county. The type is Chilian, but the species is credited to the Pacific coast, and our specimens come under it according to Suksdorf's synopsis in *Erythea*, 6: 22.

CAMPANULACEAE

CAMPANULA PRENANTHOIDES Durand, Journ. Acad. Phila. II.
3: 93. 1855.

No. 8116, collected July 14, along Deer Creek near Nevada City, Nevada county, in shaded rather damp places along the stream. From type locality.

HETEROCODON RARIFLORUM Nutt. Trans. Am. Phil. Soc. II.
8: 255. 1843.

No. 7910, collected May 30, on the grassy banks of a stream about three miles east of Redding, Shasta county, where it was abundant.

LOBELIACEAE

NEMACLADUS GRACILIS Eastw. Bull. Torr. Club, **30**: 500. 1903.

No. 7729, collected April 20, at Sunset, Kern county, on gravelly hillsides. The type is from Alcalde, Fresno county, in the same mountain range, but further north.

CICHORIACEAE

Scorzonella lepidota

Perennial, covered more or less throughout with small chaffy scales, pubescence confined chiefly to the involucre, but scanty: stems about 3 dm. high, commonly with several branches from near the base, leafy in the lower half: leaves lanceolate or oblong in outline, the lowest about 1 dm. long, 3 or 4 cm. wide, the others shorter but not narrower, all laciniately divided into long-acuminate linear or lanceolate divisions: scape-like peduncles occupying the upper half of the branches, bearing one or two leaves 3 or 4 cm. long: heads 2 cm. high, the open flower about 3 cm. across, bright yellow: bracts of the involucre in three series, the outer few, the body 3 mm. long, oblong or lanceolate, 2 mm. wide, with an abrupt acumination 2 mm. long; the second series with quadrate-ovate body 4 mm. long, 3 mm. wide, abruptly narrowed to an apiculation over 2 mm. long; the inner lanceolate, almost 2 cm. long including the long acumination of 7 or 8 mm. into which the 4 mm. wide body gradually tapers: akene 5 mm. long; the linear-oblong palea 5 mm. long, less than 1 mm. wide, lacerate toothed about the apex; pappus dull white, 5 mm. long, armed with short ascending hairs.

The type is no. 7812, collected May 1, 1905, along the summit of the first ridge west of Keene station in the Tehachapi mountains, Kern county, California, in open grassy places. It seems to approach *S. laciniata* Nutt. of northern California and Oregon in its foliage, but is unlike it or any of the others in the essential characters of involucre, palea and pappus.

PTILOLOCALAIS NUTANS (Geyer) Greene, Bull. Cal. Acad **2**: 54.
1888.

Scorzonella nutans Geyer, in Hook. Lond. Journ. Bot. **6**:
253. 1847.

Ptilophora nutans Gray, Mem. Am. Acad. II. **4**: 1849.

Calais nutans Gray, Pac. R. R. Rep. **4**: 112. 1857.

Microseris nutans Gray, Proc. Am. Acad. **9**: 208. 1874.

No. 7939, collected June 1, near Shasta Retreat, Siskiyou county, near shrubs in somewhat clayey soil. The type was from "dry sunny loamy declivities of Spokane and Coeur d'Aleine mountains," Idaho.

ANISOCOMA ACAULIS Gray, Bost. Journ. Nat. Hist. **5**: 111.
1845.

No. 7678, collected April 14, in sandy ravines in the hills about Randsburg, Kern county. It is a handsome plant with conspicuous dark lined involucre bracts and pale yellow flowers. The "dense white tomentum on the edges of the pinnately lobed and often runcinate leaves," is not permanent.

MALACOTHRIX CALIFORNICA DC. Prodr. **7**: 192. 1838.

No. 7649, collected April 11, in sand on the edge of the plain two miles west of Pampa Station, Kern county. This is the type of the genus, collected by Douglas, perhaps at Monterey, where it is common in sand near the shore, as it also is at San Francisco and other places.

Malacolepis gen. nov.

Malacolepis coulteri (Harv. & Gray)

Malacothrix? (*Malacolepis*) *Coulteri* Harv. & Gray; Gray,
Mem. Am. Acad. II. **4**: 113. 1849.

No. 7602, collected April 6, in rich soil in ravines on the plain back of Kern, Kern county. Since this plant has been described and its characters as distinguished from true *Malacothrix* given in the Synoptical Flora, there is no need of a de-

scription here. No doubt when *Malacothrix* is again taken up, it will be restricted to the original species, and Nuttall's genera revived.

AGOSERIS HETEROPHYLLA (Nutt.) Greene, *Pittonia*, **2**: 178. 1891.

Macrorhynchus heterophyllus Nutt. *Trans. Am. Phil. Soc.* II. **7**: 430. 1841.

Cryptopleura Californica Nutt. l. c. 431.

Troximon heterophyllum Greene, *Bull. Torr. Club*, **10**: 88. 1883.

No. 7822, collected May 5, in moist ground along the railroad a short distance west of Tehachapi, Kern county. Very doubtfully referred here, the plants in flower only.

AGOSERIS RETRORSA (Benth.) Greene, *Pittonia*, **2**: 178. 1891.

Macrorhynchus retrorsus Benth. *Pl. Hartw.* 320. 1849.

Macrorhynchus angustifolius Kellogg, *Proc. Cal. Acad.* **5**: 47. 1873.

Troximon retrorsum Gray, *Proc. Am. Acad.* **9**: 216. 1874.

No. 7983, collected June 5, in moist shaded places a short distance below Shasta Springs, Siskiyou county. The type was from "montibus Sacramento."

AGOSERIS GRANDIFLORA (Nutt.) Greene, *Pittonia*, **2**: 178. 1891.

Stylopappus grandiflorus Nutt. *Trans. Am. Phil. Soc.* II. **7**: 432. 1841.

Macrorhynchus grandiflorus T. & G. *Fl. N. A.* **2**: 492. 1843.

Troximon grandiflorum Gray, *Proc. Am. Acad.* **9**: 216. 1874.

No. 8030, collected June 15, in sandy soil along the railroad at Sisson, Siskiyou county. The akene is fusiform, a little more than one-third the length of the beak.

CREPIS OCCIDENTALIS Nutt. Journ. Phila. Acad. **7**: 29. 1834
Psilochenia occidentalis Nutt. Trans. Am. Phil. Soc. II. **7**:
 437. 1841.

No. 8065, collected June 19, along the railroad near Grenada station, Siskiyou county, in rather sandy soil, where it is not uncommon. The type was collected "on the borders and in the vicinity of the river Columbia."

Hieracium nudicaule (Gray)

Hieracium cynoglossoides var. *nudicaule* Gray, Proc. Am. Acad. **19**: 68. 1883.

Hieracium barbigerum Greene, Pittonia, **3**: 228. 1897.

No. 8088, collected June 22, along the railroad near Igera, Siskiyou county, in sandy soil. The type was from the "northern portion of the Sierra Nevada, California, *Lemmon, Mrs. Austin.*" Professor Greene has given us a very good description of the plant, except the fruit. In our specimens the akene is 3 mm. long, reddish, the pappus white, 8 mm. long, very finely barbellate.

AMBROSIACEAE

GAERTNERIA DUMOSA (Gray) Kuntze, Rev. Gen. Pl. 339. 1891.

Franseria dumosa Gray, Fremont's Second Rep. 316. 1845.

No. 7754, collected April 24, on the lower part of the mountain about three miles southwest of Mojave, Kern county, just coming into bloom. The type was from "the sandy uplands of the Mohave River."

HYMENOCLEA SALSOLA T. & G. Mem. Am. Acad. II. **4**: 79.
 1849.

No. 7629, collected April 8, on the bluffs of Kern river opposite Oil City, Kern county. It is abundant at intervals on the low hills in that section. The type was from "sandy, saline uplands near the Mohave River, in the interior desert of California, *Fremont.*"

CARDUACEAE

GRINDELIA CAMPORUM Greene, Manual, 171. 1894.

No. 8117, collected July 14, near Nevada City, Nevada county, on dry grassy hillsides near pine trees. Our plant is somewhat out of the range of the original which is "common on rich plains east of the Mt. Diablo Range, but appears to belong here.

STENOTUS LINEARIFOLIUS (DC.) T. & G. Fl. N. A. **2**: 238. 1842.

Aplopappus linearifolius DC. Prodr. **5**: 347. 1836.

No. 7790, collected April 28, on the high ridge west of McKittrick, Kern county, where it is abundant as a low compact symmetrical shrub, the flowers deep yellow. It grows here on open gravelly slopes.

No. 7813, collected May 1, near Keene station in the Tehachapi mountains, Kern county, the shrub tall with slender ascending branches, growing in shaded places, the flowers light yellow.

TUMIONELLA MONACTIS (Gray) Greene, Leaflets, **1**: 173. 1906.

Aplopappus monactis Gray, Proc. Am. Acad. **19**: 1. 1883.

Ericameria monactis McClatchie, Erythea, **2**: 124. 1894.

No. 7753, collected April 24, on the lower part of the mountain about three miles southwest of Mojave, Kern county, in rocky places, the plants just coming into bloom. Originally from "borders of the Mohave Desert, S. E. California, Palmer."

LESSINGIA NEMACLADA Greene, Bull. Cal. Acad. **1**: 191. 1885.

No. 8118, collected July 14, on dry gravelly slopes near Grass Valley, Nevada county, plentiful. Originally from "El Dorado and Colusa Counties."

XYLORRHIZA TORTIFOLIA (T. & G.) Greene, Pittonia, **3**: 48.
1896.

Aplopappus tortifolius T. & G. Journ. Bost. Soc. Nat. Hist.
5: 109. 1845.

Aster tortifolius Gray, Proc. Am. Acad. **7**: 353. 1868.

Aster Mohavensis Coville, Cont. U. S. Nat. Herb. **4**: 126.
1893.

No. 7755, collected April 24, on the rocky lower slopes of the mountain about three miles southwest of Mojave, Kern county. It was noticed ten days earlier in similar situations at Randsburg, hardly in flower.

ERIGERON CALIFORNICUS Jepson, Bull. Torr. Club, **18**: 324.
1891.

No. 7579, collected March 22, on the slopes of the ridge opposite South Butte, Marysville Buttes, Sutter county, plentiful on the precipitous sides of deep ravines, the flowers pinkish. From type locality.

ERIGERON DIVERGENS T. & G. Fl. N. A. **2**: 175. 1841.

No. 7869, collected May 26, in gravel and sand at the river bridge near Redding, Shasta county. In the original from the "Rocky Mountains, and plains of the interior of Oregon," the rays were white. In our specimens they are pale blue.

ERIGERON PHILADELPHICUS L. Sp. Pl. 863. 1753.

No. 8028, collected June 13, in moist places along the railroad near Shasta Springs, Siskiyou county, the flowers pinkish. They are usually white in the Pacific coast form.

ERIGERON CONCINNUS (H. & A.) T. & G. Fl. N. A. **2**: 174.
1841.

Ditasis? concinna H. & A. Bot. Beech. 350. 1840.

No. 8063, collected along the railroad near Grenada station, Siskiyou county, where it is plentiful. The type was from the "Snake River below the Salmon Falls, Snake Country," Idaho.

ERIGERON INORNATUS Gray, Proc. Am. Acad. **16**: 88. 1880.

No. 8119, collected July 14, on dry grassy slopes near pine trees along Deer creek near Nevada City, Nevada county. To the writer this group of plants seems out of place in *Erigeron*.

GNAPHALODES CALIFORNICA (F. & M.) Greene, Manual, 183-1894.

Micropus Californicus F. & M. Ind. Sem. Petrop. **2**: 42. 1835.

No. 7808, collected May 1, on grassy ridges near Keene station in the Tehachapi mountains, Kern county, the plants low and slender. The type was from Bodega Bay, Sonoma county.

No. 7871a, collected May 26, at the river bridge near Redding, Shasta county, in gravel and sand, the plants large and branched.

STYLOCLINE GNAPHALIOIDES Nutt. Trans. Am. Phil. Soc. II. **7**: 338. 1840.

No. 7750, collected April 22, in sandy soil near Oil City, Kern county, abundant. The type was from "near Monterrey, Upper California."

ANTENNARIA ARGENTEA Benth. Pl. Hartw. 319. 1849.

No. 7999, collected June 8, on dry grassy hillsides west of Yreka, Siskiyou county, elevation less than 3000 feet. In Flora Franciscana Greene says "subalpine from Yosemite northward." The type was from "montibus Sacramento," somewhere in the neighborhood of Bear Valley, Nevada county.

WYETHIA ANGUSTIFOLIA Nutt. Trans. Am. Phil. Soc. II. **7**: 352. 1840.

No. 7877, collected May 27, near Redding, Shasta county, on grassy hillsides among shrubs. The type was from "around Monterrey, Upper California." As now interpreted the species is an aggregate or has an extended range.

BALSAMORRHIZA GLABRESCENS Benth. Pl. Hartw. 317. 1849.

No. 7802, collected May 1, on grassy slopes near trees at Keene station in the Tehachapi mountains, Kern county. The type was from "in Bear Valley, montium Sacramento." Our plant is undoubtedly distinct from *B. deltoidea* Nutt. with which it has been merged. The latter was originally from near Portland, Oregon.

HELIANTHELLA NEVADENSIS Greene, Bull. Cal. Acad. 1: 89. 1885.

No. 7941, collected June 1, near Shasta Retreat, Siskiyou county, abundant in woods recently burnt over. Type locality not given, merely "abundant in the higher Sierra." Apparently not heretofore recorded from the region where our specimens were obtained, or at such a low elevation, 2400 feet. It is common in the Donner Lake region at 6000 to 8000 feet, the flowers very large at the higher elevations.

LEPTOSYNE CALLIOPSIDEA (DC.) Gray, Syn. Fl. 1: Part 2, 300. 1884.

Agarista calliopsidea DC. Prod. 5: 569. 1836.

No. 7723, collected April 20, at Sunset, Kern county, on gravelly hillsides. It also occurs on the Mojave desert.

LEPTOSYNE BIGELOVII Gray, Syn. Fl. 1: Part 2, 300. 1884.

Pugioappus Bigelovii Gray, Pac. R. R. Rep. 4: 104. 1857.

No. 7662, collected April 12, on the ridge to the right of the mouth of Kern canyon, Kern county, plentiful in loose soil about rocks. The type was collected "on the Mohave creek."

No. 7674, collected April 13, at Kramer, San Bernardino county, on the Mojave desert, where it is very abundant, often covering many acres with yellow, and said to have been unusually plentiful this season, due to the copious rainfall.

ANISOCARPUS RADIATUS (Kellogg) Greene, Fl. Franc. 416. 1897.

Madia radiata Kellogg, Proc. Cal. Acad. 4: 190. 1873.

No. 7782, collected April 28, on the high ridge west of McKittrick, Kern county, on rich grassy slopes. The specimens were collected between 4 and 5 o'clock in the afternoon, the flowers fully open, which would tend to confirm the statement that the species in this genus and its relatives are vespertine. We know from personal observation that such is not the case with *Madia sativa*, which expands its flowers about day-break and closes them about 9 o'clock, and suspect the same is true of the species of *Madaria*.

CENTROMADIA PUNGENS (H. & A.) Greene, Manual, 196. 1884.

Hartmannia pungens H. & A. Bot. Beech. 357. 1840.

Hemizonia pungens T. & G. Fl. N. A. 2: 399. 1843.

No. 7795, collected April 29, in low sandy alkaline soil at McKittrick, Kern county, the plants just coming into flower.

ZONANTHEMIS CORYMBOSA (DC.) Greene, Fl. Franc. 425. 1897.

Hartmannia corymbosa DC. Prodr. 5: 694. 1836.

Hemizonia corymbosa T. & G. Fl. N. A. 2: 398. 1843.

No. 7746, collected April 22, in sandy soil near Oil City, Kern county, very abundant in that region. The type was no doubt from Monterey, where it is common.

CALYCADENIA SPICATA Greene, Fl. Franc. 422. 1897.

Hemizonia spicata Greene, Bull. Torr. Club, 9: 16. 1882.

No. 8120, collected July 14, on gravelly slopes near Grass Valley, Nevada county. The type was "collected at Milton Station, in the neighborhood of Stockton."

HARPAECARPUS PARVULUS (Gray) Greene, Fl. Franc. 416. 1897.

Hemizonia parvula Gray, Proc. Am. Acad. 6: 549. 1865.

Hemizonella parvula Gray, Proc. Am. Acad. 9: 189. 1874.

No. 8016, collected June 13, near Mott station, Siskiyou county, plentiful in sandy open woods.

HARPAECARPUS EXIGUUS (Smith) Gray, Bot. Mex. Bound. 101.
1859.

Sclerocarpus exiguus Smith, in Rees Cycl. 1816.

Harpaecarpus madarioides Nutt. Trans. Am. Phil. Soc.
II. 7: 389. 1840.

Madia filipes Gray, Proc. Am. Acad. 8: 391. 1873.

Madia exigua Greene, Erythea, 1: 90. 1893.

No. 7887, collected May 29, at the river bridge near Redding, Shasta county, in sand. The species is widely diffused over the Pacific coast, sometimes small and dwarfed, or tall and much branched when growing in rich soil.

BLEPHARIPAPPUS HETEROTRICHUS (DC.) Greene, Pittonia, 2:
245. 1892.

Madraglossa heterotricha DC. Prodr. 5: 694. 1836.

Layia heterotricha H. & A. Bot. Beech. 358. 1840.

No. 7661, collected April 12, on the ridge to the right of the mouth of Kern canyon, on steep slopes in loose soil about rocks, the plant with a spicy odor.

BLEPHARIPAPPUS GRAVEOLENS Greene, Pittonia, 2: 246. 1892.

Layia graveolens Greene, Bull. Cal. Acad. 1: 92. 1885.

No. 7783, collected April 28, on the high ridge west of McKittrick, Kern county, growing in rich soil in a dense growth of other herbs. It is a handsome plant with very large creamy flowers, the type from "Tehachapi Station, Kern County."

BLEPHARIPAPPUS ELEGANS (Nutt.) Greene, Pittonia, 2: 246.
1892.

Madraglossa elegans Nutt. Trans. Am. Phil. Soc. II. 7:
393. 1840.

No. 7776, collected April 26, about a mile inside the mouth of Kern canyon, on steep northerly slopes, rather abundant.

BURRIELIA MICROGLOSSA DC. Prodr. **5**: 664. 1836.

Lasthenia microglossa Greene, Manual, 205. 1894.

Baeria microglossa Greene, Fl. Franc. 438. 1897.

No. 7786, collected April 28, on the high ridge west of McKittrick, Kern county, in rich soil under oak trees; akenes of the ray flowers destitute of pappus. This plant does not look like a *Baeria*.

BAERIA DEBILIS Greene, in Gray, Syn. Fl. **1**: Part 2, 325. 1878.

No. 7664, collected April 12, on the ridge to the right of the mouth of Kern canyon, Kern county, sheltered by overhanging rocks. The type from "plains of Fresno and mountains of Kern county."

BAERIA GRACILIS (DC.) Gray, Proc. Am. Acad. **9**: 196. 1874.

Burrielia gracilis DC. Prodr. **5**: 664. 1836.

Lasthenia gracilis Greene, Manual, 206. 1894.

No. 7606, collected April 6, on the plain back of Kern, Kern county, where it is abundant, the plants low, branched from the base.

No. 7726, collected April 20, on hillsides at Sunset, Kern county, the plants rather pleasantly scented.

No. 7759, collected April 24, on low gravelly slopes at the foot of the mountain about three miles southwest of Mojave, Kern county, the plants also aromatic. Although growing only a few feet above the sands of the desert this plant was noticed only on the ridges. All of these southern forms, collected at widely separated stations in Kern county, are more uniformly branched from the base, with more numerous branches, and have broader involucrel bracts than most northern specimens.

BAERIA CHRYSOSTOMA F. & M. Ind. Sem. Petrop. **2**: 29. 1835.

Lasthenia chrysostoma Greene, Manual, 205. 1894.

No. 7785, collected April 28, on the high ridge west of McKittrick, Kern county, in grassy places near shrubs, the

plants low and inclined to branch from the base. This species is the type of the genus, collected at Bodega Bay, Sonoma county.

No. 7824, collected May 5, in damp grassy places along the railroad a short distance west of Tehachapi, Kern county, the plants tall, and in aspect more like specimens from the Bay region.

MONOLOPIA MAJOR DC. Prodr. **6**: 74. 1837.

No. 7656, collected April 12, on the ridge to the right of the mouth of Kern canyon, Kern county, plentiful on grassy slopes. It is like what is no doubt the typical plant figured by Hooker in *Icones*, *pl.* 344, with 3-toothed rays.

LEMBERTIA CONGDONI (Gray) Greene, Fl. Franc. 441. 1897.

Eatonella Congdoni Gray, Proc. Am. Acad. **19**: 20. 1883.

No. 7639, collected April 10, on the sandy plain near Oil City, Kern county, the plants large and diffuse, much branched, in which particular they are not in agreement with the original, which came from "Deer Creek, Tulare County."

SYNTRICHOPAPPUS FREMONTII Gray, Pac. R. R. Rep. **4**: 106.

pl. 15. 1857.

No. 7700, collected April 14, on the desert near Randsburg, Kern county, plentiful. The type was collected by Fremont "somewhere between the Rocky Mountains and the Sierra Nevada," very probably in the Mojave desert, as he passed through it in April when the plant was in bloom.

ERIOPHYLLUM HEERMANNI (Durand) Greene, Fl. Franc. 445.

1897.

Monolopia Heermanni Durand, Journ. Phila. Acad. II. **3**:

93. 1855.

No. 7657, collected April 12, on the ridge to the right of the mouth of Kern canyon, on steep slopes near rocks. The type was collected near Nevada City, Nevada county.

ERIOPHYLLUM AMBIGUUM Gray, Proc. Am. Acad. **19**: 26. 1883.

Lasthenia (Monolopia) ambigua Gray, Proc. Am. Acad. **6**:
547. 1865.

Bahia ambigua Gray, Bot. Cal. **1**: 382. 1876.

No. 7699, collected April 14, in sand on the desert near Randsburg, Kern county. The type was from "near Fort Tejon," Kern county.

ERIOPHYLLUM CONFERTIFLORUM (DC.) Gray, Proc. Am. Acad.

19: 25. 1883.

Bahia confertiflora DC. Prodr. **5**: 657. 1836.

No. 7774, collected April 26, about a mile within Kern canyon in sheltered places near rocks. This species as now received is an aggregate.

ERIOPHYLLUM GRANDIFLORUM (Gray) Greene, Fl. Franc. 443.

1897.

Bahia lanata var. *grandiflora* Gray, Bot. Cal. **1**: 381. 1876.

Eriophyllum caespitosum var. *grandiflorum* Gray, Proc.
Am. Acad. **19**: 26. 1883.

No. 7852, collected May 25, along the railroad just above Redding, Shasta county, on banks near shrubs. This is based on the *Bahia lanata* of Pl. Hartw. 317, from "valle Sacramento," probably in Butte county.

ERIOPHYLLUM LANATUM (Pursh) Forbes, Hortus Woburnensis,

183. 1838.

Actinella lanata Pursh, Fl. **2**: 560. 1814.

Trichophyllum lanatum Nutt. Gen. **2**: 168. 1818.

Helenium lanatum Spreng. Syst. **3**: 574. 1826.

Bahia lanata DC. Prodr. **5**: 657. 1836.

No. 7992, collected June 8, on dry hills west of Yreka, Siskiyou county, the leaves very white underneath, dense at the base.

No. 8121, collected July 14, along Deer Creek, Nevada county, near Nevada City, on dry hillsides under pine trees, the plants rather tall, equably leafy throughout.

RIGIOPAPPUS LEPTOCLADUS Gray, Proc. Am. Acad. **6**: 548. 1865.

No. 7863, collected May 26, on dry grassy hillsides west of Redding, Shasta county. It is widely distributed throughout California, as well as the whole Pacific coast, the type from "Dalles of the Columbia River, Oregon."

CHAENACTIS LANOSA DC. Prod. **5**: 659. 1836.

No. 7615, collected April 7, in sand at Caliente, Kern county. In habit this does not altogether agree with the description in the Synoptical Flora.

CHAENACTIS GLABRIUSCULA DC. Prod. **5**: 659. 1836.

No. 7650, collected April 11, on the edge of the plain two miles west of Pampa station, Kern county, in sandy soil.

CHAENACTIS STEVIOIDES H. & A. Bot. Beech. 353. 1840.

No. 7752, collected April 24, on the slopes of the mountain about three miles southwest of Mojave, Kern county. The type was from the "Snake Country," Idaho.

CHAENACTIS FREMONTI Gray, Proc. Am. Acad. **19**: 30. 1883.

No. 7665, collected April 12, on the ridge to the right of the mouth of Kern canyon, Kern county, not plentiful and just coming into bloom, the plants with some woolly pubescence.

No. 7727, collected April 20, at Sunset, Kern county, on gravelly hillsides. The type was from the "desert of the Mohave and Lower Colorado."

CHAENACTIS DOUGLASII (Hook.) H. & A. Bot. Beech. 354. 1840.

Hymenopappus Douglasii Hook. Fl. **1**: 316. 1833.

Macrocarphus Douglasii Nutt. Trans. Am. Phil. Soc. II. **7**: 376. 1840.

No. 8014, collected June 9, at Montague, Siskiyou county, plentiful on sandy plains. Originally from "barren dry sandy grounds of the Columbia, from the Great Falls to the Rocky Mountains."

ACHILLEA LANULOSA Nutt. Journ. Acad. Phila. 7: 36. 1834.

No. 8067, collected June 19, along the railroad near Grenada station, Siskiyou county. Various forms of this species abound in California, but the rays are smaller than in typical material.

ARNICA DISCOIDEA Benth. Pl. Hartw. 319. 1849.

No. 7943, collected June 1, near Shasta Retreat, Siskiyou county, in woods recently burnt over, elevation 2400 feet. It occurs at 4000 feet and more in the mountains of Lake county. The type was from "in sylvis prope Monterey."

SENECIO ARONICOIDES DC. Prod. 6: 426. 1837.

No. 8029, collected June 15, at Sisson, Siskiyou county, where it is not uncommon in sandy woods. The original was from somewhere in the coast region.

SENECIO AUREUS L. Sp. Pl. 870. 1753.

No. 8076, collected June 20, at Gazelle, Siskiyou county, in damp meadows. This is of course not true *aureus*, which is confined to the eastern side of the continent, but the writer is not inclined at present to describe it.

SENECIO EURYCEPHALUS Gray, Mem. Am. Acad. II. 4: 109. 1849.

No. 7871, collected May 26, at the river bridge near Redding, Shasta county, in gravel and sand. The original was collected in "California," by Fremont.

CARDUUS BROWNII Eastw. ined.

No. 8077, collected June 20, in moist meadows at Gazelle, Siskiyou county. It belongs in the same group with *C. Drummondii*.

ADDENDA

Some few species were overlooked or not determined in time to be included in their proper place.

MELICA IMPERFECTA Trin.

No. 7353, collected April 23, 1904, in the foothills west of Los Gatos, Santa Clara county, in open places on a wooded hill.

BROMUS RUBENS L.

No. 7352, collected April 23, 1904, in the foothills west of Los Gatos, Santa Clara county, on open slopes. It is very common on the hills about Bakersfield and in the Tehachapi mountains, but specimens were not obtained there.

CAREX NEBRASKENSIS Dewey, Am. Journ. Sci. II. **18**: 102. 1854.

No. 7773, collected April 26, about a mile inside of Kern canyon, Kern county, in wet sand on the edge of the river; not abundant.

JUNCUS DUBIUS Engelm. Trans. St. Louis Acad. **2**: 459. 1866.

No. 7516, collected June 16, in the foothills west of Los Gatos, Santa Clara county, found sparingly in wet clay soil. The type "forming large tufts in wet granitic sand in Clark's meadow, near the Big Tree Grove, Mariposa, California."

ALLIUM SERRATUM Wats.

No. 7861, collected May 26, on dry hills west of Redding, Shasta county, under trees. This form has smaller deeper colored flowers than those from Kern county. The writer is of the opinion, based upon field observations, that several species are included under this name, and that the distinctive characters in this case are found in the flowers rather than in the markings of the bulb coats.

CHORIZANTHE STELLULATA Benth. in DC. Prodr. **14**: 26. 1856.

No. 7910a, collected May 30, in grassy open places about three miles east of Redding, Shasta county. The type was from "in valle Sacramento."

BUTNERIA OCCIDENTALIS (H. & A.) Greene, Erythea, **1**: 207. 1893.

Calycanthus occidentalis H. & A. Bot. Beech. 340. 1840.

No. 7916, collected May 31, near Middle Creek station, Shasta county, in moist places. It is not uncommon along the upper Sacramento.

CAULANTHUS COULTERI Wats.

No. 7630, collected April 8, on the bluffs of Kern river near Oil City, Kern county. This form is abundant on the hills east of Bakersfield, and is probably distinct, especially if our no. 7768 is typical.

LOTUS PINNATUS Hook. Bot. Mag. *pl.* 2913. 1829.

Hosackia bicolor Dougl. Bot. Reg. *pl.* 1257. 1829.

No. 7905, collected May 30, on the banks of a stream about three miles northeast of Redding, Shasta county. This species is said to be rare in California.

CARUM KELLOGGII Gray, Proc. Am. Acad. **7**: 344. 1867.

Ataenia Kelloggii Greene, Pittonia, **1**: 274. 1889.

No. 7535, collected September 12, 1904, in the foothills west of Los Gatos, Santa Clara county. The type was from San Jose, nine miles from Los Gatos. It is rather common locally on grassy banks, flowering in July.

NEMOPHILA INSIGNIS Dougl. Journ. Hort. Soc. **3**: 275.

No. 7569, collected March 22, in low rich ground in grassy places at Sutter City, Sutter county, the flowers on some plants smaller and of a deeper blue.

NEMOPHILA BRANDEGEI Eastw. Bull. Torr. Club, **29**: 471. *pl.*
21. f. 1. 1902.

No. 7710, collected April 18, on grassy slopes at Girard station in the Tehachapi mountains, Kern county, the flowers bright blue. The type from near Zapato, Fresno county.

NEMOPHILA MICRANTHA Eastw.

No. 7843, collected May 15, about a mile above Alma, Santa Clara county, along the roadside in rich damp soil.

NEMOPHILA GRACILIS Eastw. Bull. Torr. Club, **28**: 154. *pl. 18.*
f. 20. 1901.

No. 7718, collected April 18, near Girard station in the Tehachapi mountains, Kern county, in rich loose soil under oak trees in a ravine. The type was collected near Fresno.

NEMOPHILA HISPIDA Eastw. Bull. Torr. Club, **28**: 152. *pl.*
18. f. 17. 1901.

No. 7572, collected March 22, on the summit of the ridge east of South Butte, Marysville Buttes, Sutter county, on the north side, sheltered by rocks. The type was collected between Clear Lake and Bartlett Springs, Lake county.

Eucrypta micrantha (Torr.)

Phacelia micrantha Torr. Bot. Mex. Bound. 144. 1859.

Macrocalyx micranthus Coville, Cont. U. S. Nat. Herb. **4**:
157. 1893.

No. 7682, collected April 14, on hills near Randsburg, Kern county, under shelving rocks, the plants with an aromatic not unpleasant scent. The flowers of the original, collected "near El Paso," Texas, are described as "pale purple," while in ours they are creamy.

SUMMARY

The species enumerated in this report are from two widely separated portions of the State, a distance of 550 miles intervening between the two nearest points. Those from the southern part were collected in Kern county, with a few from San Bernardino county at Kramer, in the Mojave desert, while those from the north were obtained in Shasta and Siskiyou counties.

With the exception of two weeks spent at Sisson, Siskiyou county, at the foot of Mt. Shasta (and that region yielded several novelties), the places visited were almost unexplored botanically or collections had been made there during some other part of the season. The collection therefore is rich in novelties and rare species. A number of genera exhibit marked characters in their flowers, but these characters are often much obscured in the process of drying. It has been the writer's practice during the past two or three years to write descriptions whenever possible from the living plants in such cases, and this has been done especially with the genus *Lupinus*, which he is studying in particular, the result being that many strong characters are brought out which one never sees mentioned in our books. With the exception of two or three species, the flowers of the new lupines in this collection were drawn up from living material, the flower fully expanded.

The month of April and the first week of May was spent at Bakersfield, Kern county, from which place various points in the surrounding country were visited.

Bakersfield is built on a sandy plain at the upper end of the San Joaquin valley, elevation some 400 feet. To the south and west the plain extends for forty or fifty miles to the Tehachapi and southern Coast Range respectively, while on the east the foothills are only fifteen miles distant. On the northeast the plain rises gradually for about eight miles until the elevation is perhaps 1000 feet, then drops perhaps 200 feet, with a bench a mile or more wide, then another drop of 200 or 300

feet to a bench about a mile wide and two miles long where in ages past the Kern river flowed, but now is limited to a narrow channel a number of feet lower. The river breaks abruptly through the mountains at this point, having cut a narrow but deep pathway across the ridges.

The formation of the country between Bakersfield and the river is mostly disintegrated granite, devoid of trees and shrubs, and is not very prolific in plant life, although in early spring a number of species may be found, especially over the less elevated portions near the town and on the bluffs along the river.

The lower foothills too are open, with little in the way of arborescent growth except in the ravines, and the species are as a whole different from those found on the plain, the line of demarcation being very sharp.

On the right bank of the river, extending from the point where it emerges from the Sierra to opposite Bakersfield are low barren appearing sandy hills, the portion nearest Bakersfield dotted with oil derricks. The flora here is of a somewhat different nature from either that of the plains or of the Sierra, and has a few species in common with the oil fields on the west side of the valley, fifty miles distant. Here is found a representative of the desert flora, *Ephedra nevadensis*, growing in the sandy ravines near the river. On the south and southeast the Tehachapi range forms a barrier between the San Joaquin valley and the desert, with an elevation of a little over 4000 feet at Tehachapi pass, while a number of peaks rise from 6000 to 8000 feet. The elevation of the desert at the foot of the mountains is about 3000 feet.

Although much of the upper San Joaquin valley is practically a desert except where irrigation is possible, the vegetation with a few exceptions is quite distinct from that of the desert proper. Whether the few species observed in isolated places are far removed from their natural habitat, or intermediate stations exist, my explorations were too limited to determine. *Ephedra nevadensis* was collected opposite Bakersfield. *Lepto-*

syne bigelovii was found on steep slopes at the mouth of Kern canyon, but its home is on the desert, there being acres of it in places, notably about Mojave. *Caulanthus inflatus* and *Eurotia lanata* occur on the hills at Sunset in the southern Coast Range, both characteristic desert plants. *Chaenactis fremontii* is plentiful at Sunset, and was also found sparingly about the mouth of Kern canyon.

On the other hand, some species which normally belong in less arid regions were found on the desert, but usually only on the hills. Of these, two conspicuous examples are *Lotus nudiflorus* and *Dichelostemma capitatum*. *Emmenanthe penduliflora* is equally at home on desert mountains and in the Coast Range near San Francisco Bay, where the precipitation is three or four times greater, and the climatic conditions very different. *Thelypodium lasiophyllum* is another example of this class, but the desert form is somewhat lower and stouter.

Since a list of the species found in the different counties may be useful, they are here enumerated. Further study may cause a revision of some of the names, but as a whole they are fairly correct.

KERN COUNTY

<i>Pellaea ornithopus</i>	<i>Allium serratum</i>
<i>Selaginella bigelovii</i>	<i>Hookera terrestris</i>
<i>Ephedra nevadensis</i>	<i>Triteleia laxa</i>
<i>Muhlenbergia debilis</i>	<i>Calliprora scabra</i>
<i>Melica imperfecta</i>	<i>Dichelostemma capitatum</i>
<i>Distichlis spicata</i>	<i>Populus fremontii</i>
<i>Achyrodes aureum</i>	<i>Salix exigua</i>
<i>Poa gracillima</i>	<i>lasiolepis</i>
<i>Carex nebraskensis</i>	<i>Urtica breweri</i>
<i>Zygadenus venenosus</i>	<i>Parietaria floridana</i>
<i>Allium hyalinum</i>	<i>Pterostegia drymarioides</i>
<i>parryi</i>	<i>Hollisteria lanata</i>

Chorizanthe membranacea	Caulanthus inflatus
xanti	Lepidium dictyotum
Mucronea perfoliata	flavum
Eriogonum angulosum	fremontii
clavatum	nitidum
gossypinum	Roripa palustris
polifolium	Tropidocarpum gracile
pusillum	macrocarpum
variabile	Athysanus pusillus
viridescens	Thysanocarpus affinis
Persicaria lapathifolia	desertorum
Eurotia lanata	foliosus
Allenrolfia occidentalis	Sophia californica
Dondia californica	Arabis maxima
Mirabilis californica	Cheiranthus angustatus
Calyptridium monandrum	Isomeris globosa
Montia parviflora	Lithophragma austromontana
Arenaria douglasii	Ribes quercetorum
Isopyrum occidentale	wilsonianum
Delphinium greenei	Lupinus arenicola
recurvatum	austromontanus
roseum	benthami
Ranunculus ludovicianus	densiflorus
Hesperomecon lineare	desertorum
Platystemon anemonoides	horizontalis
Eschscholtzia covillei	micranthus
cruciata	nana
macrantha	proximus
minutiflora	ruber
thermophila	Trifolium ciliolatum
Meconopsis crassifolia	gracilentum
heterophylla	melananthum
Thelypodium cooperi	neolagopus
lasiophyllum	scabrellum
Caulanthus coulteri	stenophyllum

<i>Lotus glaber</i>	<i>Linanthus dichotomus</i>
<i>nudiflorus</i>	<i>graciosus</i>
<i>wrangelianus</i>	<i>parryae</i>
<i>Astragalus fremontii</i>	<i>pharnaceoides</i>
<i>Phaca leucoloba</i>	<i>Phacelia ammophila</i>
<i>oxyphysa</i>	<i>ciliata</i>
<i>tejonensis</i>	<i>dauidsonii</i>
<i>Hesperastragalus didymocarpus</i>	<i>fremontii</i>
<i>Erodium macrophyllum</i>	<i>hispidia</i>
<i>Croton californicus</i>	<i>platyloba</i>
<i>Rhamnus crocea</i>	<i>tanacetifolia</i>
<i>Sidalcea malvaeflora</i>	<i>Emmenanthe penduliflora</i>
<i>Malvastrum parryi</i>	<i>Conanthus depressus</i>
<i>Viola douglasii</i>	<i>Macrocalyx membranaceus</i>
<i>purpurea</i>	<i>Nemophila brandegei</i>
<i>Acrolasia affinis</i>	<i>gracilis</i>
<i>aurea</i>	<i>Eucrypta micrantha</i>
<i>pectinata</i>	<i>Pectocarya linearis</i>
<i>viridescens</i>	<i>Piptocalyx circumscissus</i>
<i>Clarkia rhomboidea</i>	<i>Plagiobothrys canescens apertus</i>
<i>Anogra californica</i>	<i>cooperi</i>
<i>Taraxia palmeri</i>	<i>nothofulvus</i>
<i>Sphaerostigma campestre</i>	<i>Cryptanthe affinis</i>
<i>Chylisma clavaeformis</i>	<i>barbigera</i>
<i>Bowlesia septentrionalis</i>	<i>cycloptera</i>
<i>Lomatium utriculatum</i>	<i>flaccida</i>
<i>Microsteris californica</i>	<i>intermedia</i>
<i>Gilia inconspicua</i>	<i>pterocarpa</i>
<i>latiflora</i>	<i>Amsinckia intermedia</i>
<i>pluriflora</i>	<i>spectabilis</i>
<i>staminea</i>	<i>tessellata</i>
<i>stellata</i>	<i>vernica</i>
<i>tricolor</i>	<i>Salvia carduacea</i>
<i>Linanthus bicolor</i>	<i>columbariae</i>
<i>breviculus</i>	<i>Lycium fremontii</i>

<i>Solanum xanti</i>	<i>Stylocline gnaphalioides</i>
<i>Collinsia bicolor</i>	<i>Balsamorhiza glabrescens</i>
<i>Scrophularia californica</i>	<i>Leptosyne bigelovii</i>
<i>Diplacus latifolius</i>	<i>calliopsidea</i>
<i>Mimulus langsdorffii</i>	<i>Anisocarpus radiatus</i>
<i>Castilleja candens</i>	<i>Centromadia pungens</i>
<i>Orthocarpus attenuatus</i>	<i>Zonanthemis corymbosa</i>
<i>purpurascens</i>	<i>Blepharipappus elegans</i>
<i>Plantago erecta</i>	<i>graveolens</i>
<i>scariosa</i>	<i>heterotrichus</i>
<i>Galium angustifolium</i>	<i>Burrielia microglossa</i>
<i>Sambucus velutina</i>	<i>Baeria chrysostoma</i>
<i>Plectritis samolifolia</i>	<i>debilis</i>
<i>Nemacladus gracilis</i>	<i>gracilis</i>
<i>Scorzonella lepidota</i>	<i>Monolopia major</i>
<i>Anisocoma acaulis</i>	<i>Actinolepis multicaulis</i>
<i>Malacothrix californica</i>	<i>Syntrichopappus fremontii</i>
<i>Malacolepis coulteri</i>	<i>Eriophyllum ambiguum</i>
<i>Agoseris heterophylla</i>	<i>confertiflorum</i>
<i>Gaertneria dumosa</i>	<i>heermanni</i>
<i>Hymenoclea salsola</i>	<i>Chaenactis fremontii</i>
<i>Stenotus linearifolius</i>	<i>glabriuscula</i>
<i>Tumionella monactis</i>	<i>lanosa</i>
<i>Xylorrhiza tortifolia</i>	<i>stevioides</i>
<i>Gnaphalodes californica</i>	

SAN BERNARDINO COUNTY

A small collection was made in this county while waiting between trains at Kramer, on the Mojave desert. All are desert species, two of them, *Lupinus odoratus* and *Orthocarpus venustus*, new species. Two others, the plants called *Gilia inconspicua* and *Acrolasia affinis* may prove to be the types of undescribed species when I have time to study them closer.

<i>Eschscholtzia minutiflora</i>	<i>Lupinus odoratus</i>
<i>Lepidium flavum</i>	<i>Astragalus layneae</i>

Acrolasia affinis	Cryptanthe pterocarya
Gilia inconspicua	Amsinckia tessellata
latiflora	Orthocarpus venustus
Linanthus parryae	Leptosyne bigelovii

YUBA COUNTY

A single day, March 21st, was spent at Marysville in the Sacramento valley, elevation 66 feet, distance north of San Francisco 142 miles, or over 400 miles north of Bakersfield, and the average rainfall at least twice greater. Of the ten species of flowering plants collected here, four were also obtained in Kern county, two of them, *Salix lasiolepis* and *Plantago erecta*, in the Tehachapi mountains at elevations of 2500 to 3000 feet, and the other two, *Lepidium nitidum* and *Lotus Wrangelianus*, near Bakersfield. But only one of these, *Lotus Wrangelianus*, is identical in form. The collection from this place is too small for trustworthy comparison.

Lemna minor	Trifolium depauperatum
Salix lasiolepis	truncatum
Lepidium nitidum	Lotus wrangelianus
Lupinus persistens	Orthocarpus bidwelliae
polycarpus	Plantago erecta

SUTTER COUNTY

March 22d was spent at the Marysville Buttes, an isolated group of mountains fifteen miles or more northwest of Marysville, rising about 2000 feet above the Sacramento valley, and wholly unconnected with either the Sierra Nevada or the Coast Range. Only one of the ridges was ascended, the summit about 1200 feet above sea level. Of the sixteen species collected, four are also listed from Kern county, but only one, *Orthocarpus attenuatus*, similar in form. The other three are *Pterostegia drymarioides*, *Lupinus micranthus*, and *Gilia staminea*. The Kern county plants were collected at elevations of from 1000 to 4000 feet.

Selaginella hanseni	Trifolium columbinum
Pterostegia drymarioides	watsoni
Eschscholtzia lobbii	Nemophila hispida
Platystemon proximus	insignis
Sedella pumila	Gilia staminea
Lupinus albifrons	Orthocarpus attenuatus
micranthus	Plantago erecta
pachylobus	Erigeron californicus

SHASTA COUNTY

Redding is situated at the extreme upper end of the Sacramento valley, elevation 557 feet at the railroad station, and is 260 miles north of San Francisco. The Sacramento valley proper which is flat and treeless except along streams, ends some miles below Redding, the whole space between the Sierra Nevada and the Coast Range suddenly rising one or two hundred feet, comparatively level over the whole area, and rather well timbered with oak trees. The town is built on the edge of the hills which extend back a few miles to the Coast Range, and at this place also the Sacramento river emerges from the deep canyon which it has cut through the mountains from its source at the base of Mt. Shasta, 80 miles further north. The collecting was confined mainly to the river banks near Redding, none of the points visited being more than five or six miles from the town.

Only five species listed from Kern county were collected here, and all differ in form, three of them perhaps distinct. The five are *Allium serratum*, *Montia parviflora*, *Lomatium utriculatum*, *Mimulus langsdorffii*, and *Gnaphalodes californica*.

Marsilea vestita	Elymus glaucus
Panicum occidentale	Scirpus riparius
Polypogon littoralis	Odontostomum hartwegi
Deschampsia calycina	Allium attenuifolium
Melica californica	serratum
Bromus pumpellianus	Hesperocordum lacteum

Hookera californica	Sidalcea asprella
Dichelostemma multiflorum	Boisduvalia densiflora
Calochortus luteus oculatus	macrantha
Salix fluviatilis	Godetia rostrata
hindsiana	Sphaerostigma contortum
nigra	Datisca glomerata
Aristolochia californica	Pteryxia californica
Chorizanthe stellulata	Lomatium tomentosum
Eriogonum polyanthum	utriculatum
Rumex occidentalis	Arctostaphylos manzanita
salicifolius	viscida
Montia perviflora	Fraxinus oregana
Ranunculus longilobus	Frasera nitida
Eschscholtzia recta	Gomphocarpus cordifolius
Butneria occidentalis	Convolvulus fruticetorum
Roripa occidentalis	Gilia glandulifera
Philadelphus californicus	tenuisecta
Drymocallis glandulosa	Linanthus filipes
Lupinus albifrons	Navarretia intertexta
luteolus	Allocarya californica
persistens	stipitata
purpurascens	Cryptanthe ambigua
Trifolium aciculare	Scutellaria austinae
geminiflorum	Stachys californica
Lotus humistratus	Solanum parishii
pinnatus	Pentstemon glaucifolius
Psoralea macrostachya	Mimulus langsdorffii
Glycyrrhiza glutinosa	Gratiola ebracteata
Vicia truncata	Castilleja douglasii
Ptelea crenulata	Orthocarpus brownii
Polygala cornuta	Thalesia fasciculata
Aesculus californica	Galium pubens
Rhamnus tomentella	vaillantii
Ceanothus nevadensis	Lonicera interrupta
Vitis californica	Heterocodon rariflorum

<i>Erigeron divergens</i>	<i>Eriophyllum grandiflorum</i>
<i>Gnaphalodes californica</i>	<i>Rigiopappus leptocladus</i>
<i>Wyethia angustifolia</i>	<i>Senecio eurycephalus</i>
<i>Harpaecarpus exiguus</i>	

SISKIYOU COUNTY

This county touches Shasta on the south, extending northward to the Oregon line. The southern half is mountainous, while the northern part contains several fertile valleys, notably Shasta valley.

Collections were made in early June in the gorge of the Sacramento river between Dunsmuir and Shasta Springs, elevations from 2284 to 2536 feet.

Above Shasta Springs is a plateau lying between Mt. Shasta and the Coast Range, five or six miles wide and about ten long, with elevations between 3400 and 4000 feet, part of it swampy meadow land and part sandy chaparral. The species as a whole differ from those in the gorge of the Sacramento, 1000 feet lower. *Ceanothus cordulatus* and *C. velutinus* are the chief components of the chaparral growth, the former at lower, the latter at higher elevations, while the swampy meadows support growths common to such places.

From Black Butte Summit, there is a gradual descent on the north side of the plateau to Shasta valley at Edgewood, elevation 2950 feet. The valley is devoid of natural arborescent growths, and presents abundant evidence of former volcanic activity in the vicinity. It is about forty miles long, with a gradual slope northward to Thrall, elevation 2179 feet, at the foot of the Siskiyou mountains. Its flora is essentially different from that of the plateau about Sisson, and contains some small proportion of species which normally are found in the Great Basin region. But many of the species are peculiar to the valley and have not been found outside of it.

As might be expected, only a few species are the same as those enumerated from Kern county; but of the six not one ag-

grees in form, and four of them are probably distinct. The six are *Poa gracillima*, *Arenaria douglasii*, *Viola purpurea*, *Cryptantha affinis*, *C. intermedia*, and *Scrophularia californica*.

Stipa lemmoni jonesii	Montia obtusata
occidentalis	Silene lemmoni
Briza maxima	Arenaria douglasii
Poa gracillima	Paeonia brownii
laevigata	Eschscholtzia recta
Festuca pacifica	Bicuculla formosa
Bromus orcuttianus	Thelypodium brachycarpum
porteri	Lepidium draba
pumpellianus	montanum
tectorum	Thysanocarpus curvipes
Elymus condensatus	Arabis campylobola
Sitanion californicum	Alyssum alyssoides
Carex amplifolia	Cleome platycarpa
aurea	Sedum spathulifolium
bolanderi	Micranthes sierrae
lanuginosa	Peltiphyllum peltatum
marcida	Heuchera micrantha
nudata	Ribes divaricatum
sterilis	glanduliferum
Calliprora analina	hittellianum
Dichelostemma multiflorum	Opulaster capitatus
Smilax californica	Spiraea douglasii
Epipactis gigantea	Rubacer parviflorum
Limnorchis thurberi	Potentilla gracilis
Salix fluviatilis	millefolia
lasiandra	Horkelia pseudocapitata
Corylus californica	tridentata
Comandra californica	Amelanchier gracilis
Asarum majus	pallida
Eriogonum polyanthum	Cerasus parvifolia
Spraguea umbellata	Padus demissa
Montia depressa	Lupinus corymbosus

- Lupinus luteolus
 minimus
 polyphyllus
 shastensis
 violaceus
 viridifolius
 Trifolium spinulosum
 variegatum
 Lotus americanus
 crassifolius
 douglasii
 Torreyi
 Astragalus lentiginosus
 Homalobus californicus
 curvicarpus
 Vicia pumila
 Geranium longipes
 Tithymalus crenulatus
 Pachystima myrsinites
 Acer circinatum
 Rhamnus anonaefolia
 rubra
 Ceanothus cordulatus
 incanus
 nevadensis
 velutinus
 Sidalcea campestris
 Viola lobata
 purpurea
 Epilobium minutum
 Washingtonia brevipes
 Suida stolonifera riparia
 Azalea occidentalis
 Dodecatheon jeffreyi
 Glaux acutifolia
- Convolvulus malacophyllus
 polymorphus
 Collomia heterophylla
 Microsteris micrantha
 Gilia congesta
 pallida
 Linanthus ciliatus
 Phacelia heterophylla
 imbricata
 linearis
 Draperia systyla
 Eriodictyon californicum
 lobbii
 Nemophila micrantha
 Cynoglossum occidentale
 Sonnea hispida
 Cryptanthe affinis
 geminata
 intermedia
 Lithospermum californicum
 Heliotropium oculatum
 Scutellaria antirrhinoides
 nana
 Ramona humilis
 Monardella ovata
 Collinsia linearis
 Scrophularia californica
 Pentstemon cusickii
 deustus
 newberryi
 piliferus
 roezli
 Mimulus langsdorffii
 moschatus
 pulsiferae

<i>Eunanus torreyi</i>	<i>Erigeron concinnus</i>
<i>Castilleja douglasii</i>	<i>philadelphicus</i>
<i>pratensis</i>	<i>Antennaria argentea</i>
<i>Plantago shastensis</i>	<i>Helianthella nevadensis</i>
<i>Galium bolanderi</i>	<i>Harpaecarpus parvulus</i>
<i>Symphoricarpos mollis</i>	<i>Eriophyllum lanatum</i>
<i>racemosus</i>	<i>Chaenactis douglasii</i>
<i>Linnaea americana</i>	<i>Achillea lanulosa</i>
<i>Ptilocalais nutans</i>	<i>Arnica discoidea</i>
<i>Agoseris grandiflora</i>	<i>Senecio aronicoides</i>
<i>retrorsa</i>	<i>aureus</i>
<i>Crepis occidentalis</i>	<i>Carduus brownii</i>
<i>Hieracium nudicaule</i>	

NEVADA COUNTY

Two days, July 13th and 14th, were spent near Grass Valley and Nevada City in the foothills of the Sierra, elevation about 2500 feet. This region possesses an interesting flora, but has never been very well explored. The following species were collected:

<i>Hookera californica</i>	<i>Apocynum viarum</i>
<i>coronaria</i>	<i>Navarretia divaricata</i>
<i>Eriogonum capitatum</i>	<i>filicaulis</i>
<i>Microsemia polygaloides</i>	<i>Monardella lanceolata</i>
<i>Lupinus albicaulis</i>	<i>sheltonii</i>
<i>Trifolium spinulosum</i>	<i>Pentstemon azureus</i>
<i>Polygala cornuta</i>	<i>Campanula prenanthoides</i>
<i>Rhamnus tomentella</i>	<i>Grindelia camporum</i>
<i>rubra</i>	<i>Lessingia nemaclada</i>
<i>Sidalcea asprella</i>	<i>Erigeron inornatus</i>
<i>Boisduvalia imbricata</i>	<i>Calycadenia spicata</i>
<i>Arctostaphylos viscida</i>	<i>Eriophyllum lanatum</i>
<i>Apocynum oblongum</i>	

MUHLENBERGIA

A. A. HELLER, Editor

LOS GATOS, CALIFORNIA, DECEMBER 31, 1906

[All unsigned articles in this journal are by the Editor, and the types of all new species described by him are deposited in his private herbarium, unless otherwise stated.]

BOTANICAL EXPLORATION IN CALIFORNIA

SEASON OF 1906.

The collection this year though small, is of considerable interest, containing a large percentage of novelties and many rare species, nearly all of them obtained in regions little explored botanically.

April 11th and 12th the region just above Pollasky, Fresno county, on the San Joaquin river was investigated, special attention being given to the hills on the opposite side of the river in Madera county.

We have no record of collections from this vicinity since July, 1853, when several species were obtained by the botanists of Lieutenant Williamson's company of surveyors and reported upon in Pac. R. R. Rep. 5. The place recorded is Fort Miller, situated two or three miles above Pollasky on the Fresno county side. The types of *Malvastrum marrubioides*, *Hosackia lathyroides* und *Godetia williamsoni* were obtained there.

Pollasky is in the lower foothills of the Sierra, the hills in the immediate vicinity being low and rounded and devoid of woody growth; but only a short distance up the river scattered oak trees are found, and pines gradually appear as the elevation increases. My explorations were mainly confined to the Madera county side of the river to a point well up in the hills four or five miles from Pollasky, but nine numbers were collected on the Fresno county side between Pollasky and the old river bridge.

The most notable find was the long lost *Monolopia minor*, collected many years ago by Douglas and unreported from his time to the present. The strange thing about the matter is that Douglas obtained the type somewhere in the southern Coast Range.

On the return trip three numbers were obtained at Fresno, and two near Tracy, Contra Costa county, one of these latter no doubt typical *Phacelia tanacetifolia*.

The larger part of the collection is from northern Inyo county on the east side of the Sierra. Headquarters was established May 4th at Laws, the railroad station for Bishop, on the Carson & Colorado railroad, where one month was spent in exploring the surrounding country.

Owen's valley is about fourteen miles wide at this point, lying between the White mountains on the east and the Sierra Nevada on the west. The upper end of the valley extends into Nevada, gradually rising to an elevation of over 5000 feet at the upper end where a cross ridge extends from the White mountains toward the Sierra. The elevation of the summit of this ridge is between 7000 and 8000 feet. The elevation at Laws is 4100 feet,

The floor of the valley is sandy, but differs considerably in composition. The White mountains, at least near Laws, are mostly of slate and shale formation, while the Sierras are principally granite, and as a consequence the sand is much looser under foot than it is on the east side.

The general aspect of the country, outside of the irrigated tracts, is that of all arid regions, sage brush and other characteristic composites predominating in company with *Atriplex* and *Grayia*.

Much of the country between Laws and Bishop five miles southwestward is swampy, due to irrigation extending over a period of many years, for water here is abundant, Owen's river, Bishop creek and other streams which flow from the snow clad Sierras furnishing a bountiful supply.

Collecting on the east side was confined to a narrow strip about a mile wide extending from Laws to the base of the White mountains, about three miles distant, and then up Silver canyon for about five miles, the elevation probably 5500 feet at the highest point reached in the canyon. One trip was made to a point about five miles northeast, just over the Mono county line to the mouth of a canyon above the Southern Belle mine.

On the west side of the valley the formation is entirely different, being almost exclusively granite with an occasional outcrop of the ancient Alabama range. One of these outcrops is found four or five miles due west of Bishop and is called Red Hill on account of the red-brown volcanic rock abounding on it. It is a low, broad mound, the summit perhaps 400 feet above the surrounding granitic sand. Between it and the Sierra foothills is a gradually ascending sandy plain three to five miles across. The flora of this Red Hill is disappointing, since it differs in no wise from that of the granite region surrounding it. One would naturally expect to find a goodly proportion of distinct species.

Several trips were made to the foothills west of Bishop, the objective point being a series of elevated meadows extending some four or five miles down from the foot of the Sierras. Although the meadows were entered twice, they were found to be of little interest, but the adjacent hills yielded many species. The meadows are used as pasture land, which fact no doubt accounts for the scarcity of species.

The foothills southwestward from Bishop, distant three or four miles from the town, were visited twice. They are covered with immense granite boulders, as indeed are all the foothills of the Sierra on this side. Along the base of these hills *Kunzia glandulosa* is of frequent occurrence, and *Ephedra viridis* is found occasionally.

About two hours were spent on the hills west of Big Pine, fifteen miles south of Bishop, the most distant point visited.

All told, 185 numbers were obtained in Inyo county, all from the valley or in the foothills of both mountain ranges, the most of them at altitudes of from 4000 to 5000 feet, and no point as high as 6000 feet was touched. The season was an exceptionally good one, for abundant rain for that part of the country had fallen during the winter and spring. In fact the weather conditions were responsible for such an early abandonment of the field. The territory accessible from Laws was worked out for the time being, and the late-lying snows in the mountains prevented a move to higher altitudes.

A few numbers were obtained near Mina, Esmeralda county, Nevada, while waiting for train connections.

Four trips were made after my return home, one to the outskirts of San Francisco in San Mateo county, where a new *Ligusticum* was found; one to Mt. Tamalpais, which yielded a new *Cryptanthe* and the rare *Phacelia suaveolens*, and two to the vicinity of Monterey, where *Dudleya Helleri* was obtained for the first time since the collection of the type in 1903.

The unfortunate destruction by fire of the invaluable herbarium and library of the California Academy of Sciences seriously handicapped the work of identifying this collection, but my thanks are due to Professor W. A. Setchell of the University of California for courtesies extended while verifying determinations at Berkeley, and to Professor Greene for the determination of the Papaveraceae and certain other difficult groups.

POLYPODIACEAE

CEROPTERIS VISCOSA (D. C. Eaton) Underw. Bull. Torr. Club,
29: 631. 1902.

Gymnogramme triangularis var. *viscosa* D. C. Eaton,
 Ferns N. A. **2**: 16. *pl.* 48. *f.* 5. 1880.

No. 8140, collected April 11, in Madera county near the banks of the San Joaquin river about three miles above Pollasky, growing between and under the overhanging parts of great granite boulders. It is abundant at that particular point, and looked very unlike *C. triangularis* of which it has been considered but a mere form. When fresh the upper side of the frond is much paler than is that of the other species, and the whole plant less stiff.

CHEILANTHES FENDLERI Hook. Sp. Fil. **2**: 103. *pl.* 107. *B.*
 1858.

No. 8261, collected May 5, near Big Pine, Inyo county, on the hills just west of the county hospital, growing about the base of a large overhanging granite rock. It was abundant at this place, but not noted elsewhere. It was first supposed to be *C. clevelandi*, but does not have the "ciliated and lacinated scales" of that species.

POLYPODIUM SCOULERI Hook. & Grev. Icon. Fil. **1**: *pl.* 56.
 1829.

Polypodium pachyphyllum D. C. Eaton, Am. Journ. Sci. II.
22: 138. 1856.

Polypodium carnosum Kellogg, Proc. Cal. Acad. **2**: 88. *f.*
 24. 1861.

No. 8370, collected June 8, on the western end of the San Bruno hills, San Francisco, growing in the crevices of granite boulders. The thick and short leathery frond separate it at once from *P. californicum*. It appears to be restricted to the immediate vicinity of the coast, and is said to range from California to British Columbia.

SELAGINELLACEAE**SELAGINELLA HANSENI**

No. 8173, collected April 12, in Madera county about three miles above Pollasky, growing mostly on flat granite rocks at the point of contact with the soil. Rather common in the vicinity.

GNETACEAE

EPHEDRA VIRIDIS Coville, Cont. U. S. Nat. Herb. 4: 220. 1893.

No. 8299, collected May 21, at the mouth of a canyon about three miles south of Bishop, Inyo county, in the Sierra foothills in granite sand, the elevation about 4500 feet. It occurs here and there, but was nowhere abundant. The type was collected "near Crystal Spring, Coso Mountains, Inyo County, California."

MELANTHACEAE***Toxicoscordion arenicola***

Bulbs broadly ovoid, 15 mm. or less in diameter, clothed with dark brown outer coats: stems 5 dm. or less high, rather slender, glabrous, leafy below: leaves somewhat sheathing, mostly basal, a little more than half the length of the stem, 8 mm. wide or less, scabrous on the margins, not noticeably striate, reduced on the upper part of the stem to bracts with broad base and filamentous apex: inflorescence at first short and dense, 3 cm. across, 4 or 5 cm. long, at length becoming 1 to 2 dm. long: pedicels very slender, 15 mm. long or less, both spreading and ascending: bracts membranous, 5-7 mm. long, acuminate from a base 2 mm. wide: perianth white, 7 mm. across when expanded, the divisions oblong, the outer ones a little shorter and narrower than the inner, these 3 mm. long, over 2 mm. wide, all faintly 3-toothed at apex and equally very short clawed (about $\frac{1}{2}$ mm.) at base, with a small yellow almost orbicular fimbriate gland just above the claw: stamens about 4 mm. long; anthers

cream-colored: pistil half the length of the stamens, cleft for half its length.

The type is no. 8321, collected in dry granite sand among the foothills west of Bishop, Inyo county, California, May 23, 1906. It was found at an elevation of perhaps 5000 feet, and is rather plentiful at places. If heretofore collected it has no doubt passed for *Zygadenus venenosus*, which as described by Watson is an aggregate, and the name must be restricted to the large flowered coast form, taking the plant from Monterey county as the type.

ALLIACEAE

ALLIUM DICHLAMYDEUM Greene, Pittonia, 1: 166. 1888.

No. 8375, collected June 8, at the western end of the San Bruno hills near Ocean View, San Francisco, growing in a tangle of other vegetation. So far this species has been found only about San Francisco near the ocean. Originally recorded from "seaward slopes of the Mission hills, and at the Marine Hospital, San Francisco, flowering in May and June."

ALLIUM HYALINUM Curran

No. 8144, collected April 11, in Madera county on the San Joaquin river at the old bridge above Pollasky, growing in rich wet ground on the edges of pools, the plants in dense colonies.

ALLIUM ATRORUBENS Wats. Bot. King Rep. 352. *pl.* 38. *f.* 4-5. 1871.

No. 8277, collected May 18, in coarse granite sand in the foothills west of Bishop, Inyo county. It is abundant here and there, the stem usually only an inch or two above the ground. The type came from "dry foot-hills from the West Humboldt to the Havallah Mountains, Nevada."

CALOCHORTACEAE

CALOCHORTUS EXCAVATUS Greene, Pittonia, 2: 71. 1890.

No. 8350, collected May 30, in damp grassy meadows near Bishop, Inyo county. It was rather plentiful in one meadow, and is from type locality, "Bishop Creek, Inyo County." The leaves are narrow and grass-like, only 2 or 3 mm. wide, bright green, the lower ones commonly about 1 dm. long. The plants are rather small and slender, the tallest about 2 dm. high.

CALOCHORTUS NUTTALLII T. & G. Pac. R. R. Rep. 2: 124.
1855.

No. 8328, collected May 23, in coarse granite sand along the edge of the foothills west of Bishop, Inyo county. This is *C. nuttallii* as generally accepted, and as defined by Purdy in Proc. Cal. Acad. III. Bot. 2: 148. 1901, but does not altogether accord with the original from "summit of Noble's Pass, Sierra Nevada." That has "stem 2-flowered; leaves very narrowly linear; petals obovate-cuneate, rounded at the summit (white, but yellow at the base), with an oblong dense tuft of hairs on the claw; and just above this a purple spot, with a few scattered hairs." The petals in our plant have a raised blunt point, the gland is roundish, "covered densely with agglutinated hairs," as described by Purdy. In addition there is a purple, somewhat lunate-shaped spot below the gland, with a yellow and yellow-haired band around the gland except at the base, and above the yellow band a purple somewhat penciled spot. It is possible that the plant called *C. leichtlinii* is typical *nuttallii*, and that much of what passes for the latter is unnamed. My 7062, collected in 1903 on the slopes of Castle Peak, Nevada county, distributed as *C. leichtlinii* is perhaps typical *nuttallii*, judged by the original description.

IXIACEAE

IRIS MISSOURIENSIS Nutt. Journ. Acad. Phila. 7: 58. 1834.

No. 8179, collected May 5, in wet meadows at Laws, Inyo county, where it is abundant, growing either in colonies or as individuals. The type locality is "toward the sources of the Missouri," and it hardly seems possible that the species extends over such a wide expanse of territory as is supposed, but lack of knowledge of the typical plant compels the placing of our specimens here.

SISYRINCHIUM HALOPHILUM Greene, Pittonia, 4: 34. 1899.

No. 8353, collected May 30, in wet meadows near Bishop, Inyo county, where it is not uncommon. The type was collected at "Humboldt Wells, near Wells, Nevada."

SALICACEAE

SALIX EXIGUA Nutt.

No. 8180, collected May 5, at Laws, Inyo county, along an irrigating ditch. It is not uncommon in wet places in that part of Owen's valley at elevations of 4000 to 5000 feet, occurring as a slender shrub five or six feet high, with wand-like branches.

SALIX LASIOLEPIS Benth.

No. 8268, collected May 16, in Silver canyon in the White mountains opposite Laws, Inyo county, about four miles up the canyon, elevation probably 5000 feet. The specimens are referred here for the present, although far from typical. The bark is pale instead of very dark, and the leaves are too short. It is common in this canyon.

Salix caudata (Nutt.)

Salix pentandra var. *caudata* Nutt. Sylva, **1**: 61. *pl.* 18.
1842.

Salix Fendleriana Anders. Oefv. Vet. Akad. Foehr. **15**:
115. 1858.

Salix arguta Anders. Koenigl. Sven. Vet. Akad. Handl.
6: 32. 1867.

Salix lasiandra var. *Fendleriana* Bebb, Bot. Cal. **2**: 84.
1880.

Salix lasiandra var. *caudata* Sudw. Bull. Torr. Club, **20**:
43. 1893.

No. 8327, collected May 23, in the foothills west of Bishop, Inyo county, on the banks of Birch creek, elevation about 5000 feet, where it occurred as a stout spreading bush ten feet high. Our plant is much like one collected by C. F. Baker at Cimarron, Colorado, and the same thing was collected by Hall on San Jacinto mountain, no. 2447, labeled *Salix cordata* var. *mackenziana*. In the recently issued Flora of Colorado, Rydberg recognizes this as a species, but under the name "*Salix Fendleriana*." That it is intentional is shown by the citing of Nuttall's name as a synonym. There may be a valid reason for ignoring this first name which belongs to the plant by reason of priority, but I have not yet discovered it.

SALIX LAEVIGATA Bebb, Am. Nat. **8**: 202. 1874.

No. 8239, collected May 12, along an irrigating canal in the sand hills three miles west of Laws, Inyo county, the specimens from a shrub six or eight feet high. It is common in the vicinity generally a large tree where it is planted along roads and fences. The type came from Santa Cruz, on the coast 80 miles south of San Francisco, and it was a surprise to find it on the east side of the Sierra. Coville, however, records it from Inyo county in the Death Valley report.

BETULACEAE

BETULA OCCIDENTALIS Hook. Fl. Bor. Am. **2**: 155. 1839.

No. 8266, collected May 16, in Silver canyon in the White mountains opposite Laws, Inyo county, at about 5500 feet elevation, on the banks of a small stream. It also occurs along streams in the Sierra foothills west of Bishop in granite formation. It is a small slender tree not over fifteen or twenty feet high, usually smaller, with yellowish bark. The original came from the "Straits of De Fuca."

POLYGONACEAE

CHORIZANTHE PUNGENS Benth. Trans. Linn. Soc. **17**: 419. *pl.*
19. 1837.

No. 8283, collected June 8, in sandy soil near the Ocean Shore railroad tracks in San Mateo county, beyond Ocean View, San Francisco. The scarious margins of the involucre are present but less prominent than in specimens from Monterey, where the species is very abundant.

CENTROSTEGIA THURBERI Gray, Pac. R. R. Rep. **7**: 20. 1856.
Chorizanthe Thurberi Wats. Proc. Am. Acad. **12**: 269.
1876.

No. 8206, collected May 8, on the edge of the sand hills three miles west of Laws, Inyo county, where it is plentiful in fine granite sand. The type was collected "on sandy hill-sides near San Felipe," San Diego county.

OXYTHECA PERFOLIATA T. & G. Proc. Am. Acad. **8**: 191.
1870.

No. 8305, collected May 22, in the valley between Laws and Silver canyon, Inyo county. It is plentiful in the vicinity, sometimes growing in colonies and sometimes as individuals. The type was from "Nexada, Fremont, second Expedition."

ERIOGONUM PUSILLUM T. & G.

No. 8284, collected May 18, in the foothills west of Bishop, Inyo county, growing in coarse granite sand on slopes with a southerly exposure. The plants are variable in size, the largest about a foot high and as broad.

No. 8366, collected on hills near Mina, Esmeralda county, Nevada, differing in no respect from no. 8284, and growing at about the same elevation, a little under 5000 feet.

ERIOGONUM THOMASII Torr. Pac. R. R. Rep. 5: 364. 1857.

No. 8237, collected May 11, at the base of the White mountains opposite Laws, Inyo county, in sandy soil, the plants pro-cumbent. The type was collected "near Fort Yuma." Coville also reports it from the southern part of Inyo county. Our station at the upper end of the county is a considerable extension northward of the range, and it probably occurs still further north into Mono county.

Eriogonum maculatum

Annual, 1-2 dm. high, dichotomously branched from near the base, the spread of the branches often equalling the height, shortly lanate, leafy: lower leaves in a rosulate tuft at the base, obovate-spatulate, in maximum sized plants 3-4 cm. long, half of which is blade, this 15 mm. wide, obtuse and rounded at apex; stem leaves a pair at each internode, oblong, the lower 2 cm. long, 1 cm. or less wide, narrowed at the almost sessile base, acutish; the uppermost similar, smaller but usually not so small as to appear bract-like, all dull green and somewhat lanate above, paler and closely lanate beneath: bracts at the nodes three on the lower half of the plant, two on the upper half, triangular, 3 mm. long, greenish and lanate above, smoother and brownish beneath: floriferous throughout, usually a single filamentous glabrous purplish pedicel 10-15 mm. long from each internode: involucre broadly campanulate, 2 mm. high, nearly 3 mm. across, dull green, glandular puberulent, faintly 5-nerved

near the base, the short lobes barely 1 mm. long, broad and rounded, the narrow edges yellowish, the inside around the calices densely lanate: bractlets within the involucre oblong-spatulate, a little shorter than the involucre, their tips about 1 mm. wide, greenish on the outside, paler and slightly margined on the concave inside: calices pale yellow with a purple spot on the outside of each segment, 1 mm. long on slender stipes over 2 mm. long, exserted from the involucre, the lobes quadrate, slightly puberulent on the outside.

The type is no. 8233, collected May 11, 1906, at the base of the White mountains opposite Laws, Inyo county, California, growing in a mixture of gravel and sand. It is common in the vicinity, and also occurs on the west side of Owen's valley beyond Bishop, growing on granite. This species is of the *Eriogonum angulosum* group, and I think there are specimens in the herbarium of the University of California named as such. In general appearance it more nearly resembles *E. viridescens*, described on page 25 of this volume, but differs in its greener appearance, thinner leaves, smaller involucre, and yellow, purple spotted calices exserted from the involucre.

ERIOGONUM GLAUCUM Small, Bull. Torr. Club, **25**: 51. 1898.

No. 8333, collected May 25, along the base of the White mountains, in the extreme southern part of Mono county near the Southern Belle mine. It is common also in northern Inyo county, occurring on the granite sands of the western side of the valley as well as on the slates and shales of the eastern side. It is distinguished from *E. inflatum* by the lanceolate instead of ovate calyx segments. The type was collected in the Colorado desert by C. R. Orcutt, April, 1889.

ERIOGONUM NIDULARIUM Coville, Cont. U. S. Nat. Herb. **4**: 186. 1893.

Eriogonum nidularium var. *Luciense* Jones, Cont. West. Bot. **11**: 17. 1903.

No. 8306, collected about the mouth of Silver canyon in

the White mountains opposite Laws, Inyo county. The calices in these plants are dull red, their tips sometimes yellowish. The incurving of the branches is not well marked in these specimens since they are not old enough to fully show this character. Mr. Jones has merely added to synonymy unless his variety *lucense* proves to be distinct from *E. nidularium*, the designated type of which is no. 963 of the Death Valley expedition, collected in Cottonwood canyon, Panamint mountains, Inyo county, California, and it is plainly stated that "the ends of the branches curve inward, forming a dense mass somewhat resembling a bird's-nest." The species "without the incurved inflorescence" to which Jones has tried to transfer the name *nidularium* is still apparently without a name.

ERIOGONUM LATIFOLIUM Smith, in Rees Cycl. 1815.

Eriogonum arachnoideum Esch.

No. 8373, collected June 8, at the western end of the San Bruno hills near Ocean View, San Francisco, where it is plentiful. The range is along the coast from San Simeon bay, San Luis Obispo county, north to Humboldt county.

No. 8421, collected July 31, on the sand hills along the railroad two miles northeast of Del Monte, Monterey county. The plants here were larger and stouter than those of no. 8373, and more branched, growing in almost pure sand.

ERIOGONUM KENNEDYI Porter; Wats. Proc. Am. Acad. 12: 263. 1876.

No. 8317, collected May 23, in the Sierra foothills west of Bishop, Inyo county, elevation about 5000 feet, growing in coarse granite sand in dense matted masses. Plentiful at intervals, and is found as low as 4500 feet, but is not so frequent at the lower elevations. The determination is doubtful, but it is near *E. kennedyi*, the type of which came from "the Sierra Nevada, Kern Co., California."

Eriogonum saxicola

Perennial from a stout woody multicapital rootstock: stems numerous from the crown, about 5 dm. high, scape-like and naked, glabrous and glaucous, moderately stout, about 4 mm. in diameter: leaves basal, the blade coriaceous, ovate with a broad rounded apex, densely tomentose below with short cottony hairs, much less so above, the largest ones 25 mm. long, 17 mm. wide, abruptly narrowed into the petiole from the truncate or slightly cordate base; petioles glabrous and yellowish at the enlarged slightly sheathing base, more or less lanate above, the longest 6 or 7 cm. long: cymose inflorescence 3-rayed, the middle branch the longest (about 1 dm.), the lateral ones 1 or 2 cm. shorter, each branch normally again three-branched, but the middle one reduced to a single almost sessile involucre, the lateral ones about 15 mm. long: flower heads sessile or nearly so: involucre greenish-yellow, glabrous, narrowly turbinate, 4 mm. high, the divisions marked by fluted ridges, the short lobes acutish, 1 mm. long: calices sulphur-yellow, a dozen or more in a cluster, articulated at the pedicel, 3 mm. long and as broad across the top, exserted 1 or 2 mm. from the involucre on slender pubescent pedicels, the tube portion 1 mm. long, lanate, the lobes oblong, 2 mm. long, 1 mm. wide, obtuse, the margins somewhat undulate: stamens exserted 2 mm. a little paler than the calices: pistils equalling the stamens, the slender stigmatic tips very slightly hooked.

The type is no. 8298, collected May 21, 1906, about three miles south of Bishop, Inyo county, California, in the Sierra foothills, growing about granite boulders. It is rather plentiful at the type station, and occurs in similar situations at other places in the vicinity. It is a relative of *E. nudum*, but is sufficiently distinct from that species, which is found only in the western part of the State. A plant collected by Mrs. Austin and Bruce in Goose Lake valley, Modoc county, their no. 2316, is apparently the same, which would indicate an extended range for the species along the eastern base of the Sierra.

CHENOPODIACEAE

ATRIPLEX CANESCENS (Pursh) James, Trans. Am. Phil. Soc. II.

2: 178. 1825.

Calligonum canescens Pursh, Fl. Am. Sept. 370. 1814.

No 8252, collected May 14, in granite sand at the foot of the Red Hill west of Bishop, Inyo county; and it is not uncommon in sandy soil in that part of Owen's valley. The staminate plant only was collected. The type came from "in the plains of the Missouri near the Big-bend."

GRAYIA SPINOSA (Hook.) Moq. DC. Prodr. 13: Part 2, 119. 1849.

Chenopodium spinosum Hook. Fl. Bor. Am. 2: 127. 1838.

Grayia polygaloides H. & A. Bot. Beech. 388. 1841.

Eremosemium spinosum Greene, Pittonia, 4: 225. 1900.

No. 8256, collected May 14, on the Red Hill west of Bishop, Inyo county, growing in volcanic gravel and sand. The species is common in that part of Owen's valley. The type came from the "interior of North California."

EUROTIA LANATA (Pursh) Moq.

No. 8253, collected May 14, in sand at the base of the Red Hill west of Bishop, Inyo county. The pistillate plant only was collected. Occasional plants were seen, but it is not common in that part of Owen's valley.

ALLIONIACEAE

HERMIDIUM ALIPES Wats. Bot. King Rep. 286. *pl.* 32. 1871.

No. 8230, collected in Owen's valley near Laws, Inyo county, May 11. It is plentiful in extreme northern Inyo, but does not extend much further south, and was noted along the railroad from Laws north to Reno, the flowers appearing larger at the latter place. It is a nocturnal bloomer, opening early in the evening and closing the next morning, remaining open later on cloudy days. The type was collected "on low foothills in northeastern Nevada, near the Humboldt and Truckee Rivers."

MIRABILIS GLUTINOSA Aven. Nelson, Proc. Biol. Soc. Wash.
17: 92. 1904.

No. 8248, collected May 14, on the Red Hill west of Bishop, Inyo county, in volcanic detritus. It has white flowers, and is rather common in the vicinity, occurring also about granite rocks in the Sierra foothills. The type was collected at "Karslaw, Meadow Valley Wash, Nev., May 27, 1902," by Leslie N. Gooding, no. 967.

Mirabilis retrorsa

Stems several from a branched woody caudex, about 4 dm. high, branched from the base and diffusely spreading, glabrous and glaucescent below, sparsely armed above with short retrorse chaffy hairs as well as glandular in and near the inflorescence, leafy throughout: leaves light green, coriaceous, ovate, acute or acutish, the base oblique or somewhat rounded, but apparently not cordate, covered on both sides with short curved chaffy hairs, the largest with blades 22 mm. long, 16 mm. wide, on margined petioles 7 mm. long, the smaller ones somewhat shorter petioled but none sessile: involucre one-flowered, glandular, campanulate, 5 mm. high, 5-lobed, the lobes slightly unequal, lanceolate, acute, 2 mm. long; peduncles uniformly short (2-3 mm.): corolla white, campanulate-funnelform, its lobes slightly notched: immature fruit pale olive, glabrous, faintly striate.

The type is no. 8336, collected May 25, 1906, in Owen's valley in the extreme southern part of Mono county, California, near the Southern Belle mine, in gravel, growing in clumps near low shrubs. The smooth appearance and pointed leaves at once attracted attention to this plant as different from *M. glutinosa*, its nearest relative. The hairs of that species are "flattened or crinkled," the "leaves reniform, or broadly ovate-cordate, obtuse at apex and mostly broadly rounded," and the lobes of the involucre "short-ovate," all characters in which *M. retrorsa* differs.

ABRONIA TURBINATA Torr.; Wats. Bot. King Rep. 285. *pl.* 31.
1871.

No. 8346, collected May 30, in sand along the base of the sand hills northwest of Bishop, Inyo county, where it is plentiful, the stems prostrate. The flowers are white with a slight tinge of pink. The type is probably one of the specimens from "Carson and Humboldt Valleys, Nevada."

ABRONIA LATIFOLIA Esch. Mem. Acad. St. Petersb. **10**: 281.
1826.

Abronia arenaria Menzies, in Hook. Exot. Fl. **3**: *pl.* 193.
1827.

No. 8411, collected July 24, on sand hills along the beach beyond Point Pinos near Pacific Grove, Monterey county. Said to be plentiful along the coast from Monterey northward to Vancouver island. The type was from "in arenosis maritimis, Novae Californiae."

PORTULACACEAE

CALYPTRIDIMUM MONANDRUM Nutt.

No. 8283, collected May 18, in coarse granite sand in the foothills west of Bishop, Inyo county. Not apparently heretofore reported from east of the Sierra, but it is common in upper Inyo county, and no doubt occurs much further north in Mono county.

Limnia exigua (T. & G.)

Claytonia exigua T. & G. Fl. N. A. **1**: 200. 1838.

Montia spathulata var. *exigua* Robinson, Syn. Fl. **1**: Part
1, 275. 1897.

Claytonia spathulata exigua Piper, Cont. U. S. Nat. Herb.
11: 250. 1906.

No. 8296, collected May 21, in a canyon in the Sierra about four miles south of Bishop, Inyo county, growing on steep slopes in coarse granite sand. I am not at all sure that this is true *L.*

exigua, but it seems to fall under the insufficient description in the Synoptical Flora. It was noted at only one place, and is apparently not common.

ALSINACEAE

ALSINE LONGIPES (Goldie) Coville, Cont. U. S. Nat. Herb. 4:
70. 1893.

Stellaria longipes Goldie, Edinb. Phil. Journ. 7: 327. 1822.

No. 8313, collected May 23, in the foothills west of Bishop, Inyo county, on the grassy banks of a cold mountain stream; not plentiful. The species as now accepted is clearly an aggregate, and has an extremely wide range. The type came from "woods near Lake Ontario."

ARENARIA MACRADENIA Wats. Proc. Am. Acad. 17: 367. 1882.

Arenaria congesta var. *macradenia* Jones, Proc. Cal. Acad.
II. 5: 626. 1895.

No. 8358, collected May 31, in coarse granite sand in the foothills west of Bishop, Inyo county, elevation about 5500 feet. The plants grew in tufts protected by low shrubs. The type was collected "near the Mohave River, and in the mountains bordering the Mohave desert." Coville reports it from southern Inyo county on the mountains to the east of Owen's valley.

RANUNCULACEAE

DELPHINIUM ANDERSONII Gray, Bot. Gaz. 12: 52. 1887.

No. 8247, collected May 14, in volcanic detritus on the Red Hill west of Bishop, Inyo county, where it is abundant and also occurs at other places along the foothills near Bishop in granite sand. The sepals are pale blue in these plants.

DELPHINIUM GREENEI Eastw.

No. 8159, collected April 12, in Madera county on hills above the San Joaquin river about five miles above Pollasky, growing on grassy northerly slopes in rich soil. It is a beautiful plant, the flowers deep violet-purple.

HALERPESTES CYMBALARIA (Pursh) Greene, Pittonia, **4**: 208.

1900.

Ranunculus Cymbalaria Pursh, Fl. Am. Sept. **2**: 392.

1814.

Oxygraphis Cymbalaria Prantl, Engl. & Prantl, Nat. Pfl.

Fam. **3**: Abt. 2, 63. 1891.

Cyrtorhyncha Cymbalaria Britton, Mem. Torr. Club, **5**:

161. 1894.

No. 8213, collected May 9, in the White mountains along a stream in Silver canyon opposite Laws, Inyo county; also plentiful in wet meadows about Laws. The species is widely distributed, the type from "saline marshes near the salt-works of Onondago, New York."

BECKWITHIA ANDERSONII (Gray) Jepson, Erythea, **6**: 99. 1898.

Ranunculus Andersonii Gray, Proc. Am. Acad. **7**: 327.

1868.

Beckwithia Austinae Jepson, Erythea, **6**: 97. 1898.

No. 8316, collected May 23, on the foothills west of Bishop, Inyo county, growing on slopes in coarse granite sand, elevation about 5500 feet. The species was noted on several hills, always on a northerly slope, but very few plants were fit for specimens, the flowers being withered and imperfect with no signs of fruit. Apparently not previously reported from so far south.

PAPAVERACEAE

PLATYSTEMON TURBINATUS Greene, Pittonia, **5**: 188. 1903.

No. 8176, collected April 13, in a field west of Fresno, Fresno county, on the outskirts of the town, where it is plentiful. Determined by Professor Greene, who writes that my specimens are the only ones known except the type, collected near Visalia, Tulare county, by Dr. T. J. Patterson.

DENDROMECON QUERCETORUM Greene, *Pittonia*, **5**: 301. 1905.

No. 8402, collected June 12, along the railroad near the summit of Mt. Tamalpais, Marin county. The specimens are not typical, but were determined as this species by Professor Greene. The type came from the "Oakland Hills," Alameda county, and is described as "very glaucous," which character is scarcely discernable in our specimens.

ESCHSCHOLTZIA HELLERIANA Greene

No. 8419, collected July 31, in sand along the railroad near Seaside, not far from Del Monte, Monterey county, where it is plentiful in the sand hills near the railroad.

ESCHSCHOLTZIA ARVENSIS Greene, *Pittonia*, **5**: 253. 1905.

No. 8175, collected April 13, in rich soil in fields at Fresno, Fresno county. This is a beautiful annual species with large orange-colored flowers which turn pale in drying. Determined by Professor Greene.

No. 8177, collected April 14, in grain fields at Tracy, Contra costa county, the type locality. Here the plants were taller and weaker, also greener than those of no. 8175, due to the fact that they were sheltered by the tall grain in which they grew.

ESCHSCHOLTZIA ARVENSIS DILATATA Greene, *Pittonia*, **5**: 253:
1905.

No. 8133, collected April 11, in Madera county on grassy hillsides near the San Joaquin river, about three miles above Pollasky; not very common. The flowers were bright orange when fresh. The type was collected "at Lathrop," Contra Costa county, in the lower San Joaquin valley. Determined by Professor Greene.

ESCHSCHOLTZIA TENUISSIMA Greene, *Pittonia*, **5**: 285. 1905.

No. 8161, collected April 12, in Madera county on high hills overlooking the San Joaquin river about five miles above Pollasky, growing in gravelly places not far from rocks and pine

trees, and was very abundant in a limited area. The fresh flowers are bright golden yellow, turning darker when dry. It is an elegant species, one of the handsomest in the genus. The type was collected by Hansen, no. 1539, collected either in Calaveras or Amador county. Determined by Professor Greene.

ESCHSCHOLTZIA LOBBII Greene

No. 8168, collected April 12, in Madera county, in a meadow along a little stream among the hills near the San Joaquin river about four miles above Pollasky; not common. Determined by Professor Greene.

ESCHSCHOLTZIA MINUTIFLORA Wats.

No. 8195, collected May 7, on gravelly slopes about the mouth of Silver canyon in the White mountains opposite Laws, Inyo county. As described by Professor Greene, the plants are "weak and straggling rather than properly decumbent." It was found only in the White mountains. Determined by Professor Greene. My no. 7672, distributed last year under this name, is no doubt *E. micrantha*, but it does not seem to agree with the description of that species.

ESCHSCHOLTZIA COVILLEI Greene

No. 8245, collected May 14, in volcanic detritus on the Red Hill west of Bishop, Inyo county. The plants were generally rather broad, the spread of the branches about equal to the height. The petals are pale yellow, broadly obovate, about 5 mm. long and as wide. In the field it impressed me as being different from *E. minutiflora*. Determined by Professor Greene. My no. 7683, distributed last year under this name is something else.

No. 8272, collected May 18, in coarse granite sand in the foothills west of Bishop, Inyo county. The fresh flowers of this number seemed to be larger than those of no. 8245, collected about four miles east on the Red Hill. Determined by Professor Greene.

ARGEMONE MUNITA Dur. & Hilg. Pac. R. R. Rep. 5: 5. 1855.

No. 8258, collected May 15, between Bishop and Big Pine, Inyo county. Not uncommon at intervals along the roadside, the flowers varying much in size on different plants, being at least five inches across in some instances, and in others not over half as large. The original grew "in large patches at Williamson's Pass, and was in full bloom in August and September."

BRASSICACEAE

STANLEYA PINNATA (Pursh) Britton, Trans. N. Y. Acad. 8: 62. 1889.

Cleome pinnata Pursh, Fl. Am. Sept. 2: 739. 1814.

Stanleya pinnatifida Nutt. Gen. 2: 71. 1818.

No. 8182, collected May 5, near Laws, Inyo county, in dry gravelly ground along shallow washes. Noted at intervals along the railroad between Laws and Reno, Nevada. The type came from "Upper Louisiana," and its range is remarkable provided it is not an aggregate.

THELYPODIUM LACINIATUM (Hook.) Endl.; Walp. Rep. 1: 172. 1842.

Macropodium laciniatum Hook. Fl. Bor. Am. 1: 43. 1829.

No. 8262, collected May 15, near the county hospital at Big Pine, Inyo county, growing about granite rocks. Also noticed in similar situations not far from Bishop. The plants were often five or six feet high, branched, with lower leaves a foot and a half long. The type was "common on dry rocks about Wallawallah [Washington], and at Priest's Rapid [Idaho] on the Columbia."

GUILLENIA COOPERI (Wats.) Greene, Leaflets, 1: 228. 1906.

Thelypodium Cooperi Wats. Proc. Am. Acad. 12: 246. 1876.

No. 8184, collected May 5, near Laws, Inyo county, in sandy or gravelly places, sheltered by shrubs. Not uncommon on the east side of Owen's valley, but easily overlooked on account of its habitat.

GUILLENIA LONGIROSTRIS (Wats.) Greene

Arabis longirostris Wats. Bot. King Rep. 17. *pl.* 2. 1871.

Streptanthus longirostris Wats. Proc. Am. Acad. 25: 127.

1890

Guillenia rostrata Greene, Leaflets, 1: 228. 1906.

No. 8183, collected May 5, near Laws, Inyo county, in sandy and gravelly places about shrubs, growing in company with *G. cooperi*, which it resembles considerably, but is distinguished by its more branching habit, glaucous appearance, and leaves tapering at the base instead of sessile and sagittate. The type was collected "in alkaline soil at the Steamboat Springs near Washoe City," Nevada. Professor Greene informs me that the name "*rostrata*" was inadvertently printed as cited above instead of *longirostris*

CAULANTHUS GLAUCUS Wats. Proc. Am. Acad. 17: 364. 1882.

No. 8193, collected May 7, in Silver canyon in the White mountains opposite Laws, Inyo county, growing about ledges of rock in slate formation. The sepals are not "purplish" as in the type, but greenish. The type was collected at Candelaria, Esmeralda county, Nevada.

CAULANTHUS PILOSUS Wats. Bot. King Rep. 27. 1871.

No. 8295, collected May 21, in the first canyon south of Bishop, Inyo county, in the Sierra foothills, growing in coarse granite sand, some of the plants four or five feet high, branched. The type was collected "on dry foot-hills in the Truckee Valley, and near Humboldt Lake, Nevada."

LEPIDIDIUM WRIGHTII Gray, Pl. Wright. 2: 15. 1853.

No. 8215, collected May 9, in Silver canyon in the White mountains opposite Laws, Inyo county. Plentiful in different places in the canyon, varying from an inch or two to six inches in height. The type was collected by Wright in the "Valley of the Pecos [New Mexico], in alluvial soil."

LEPIDIDIUM FRÉMONTII Wats.

No. 8310, collected May 22, in the valley between Laws and the White mountains, Inyo county, where it is plentiful. In the report of the Death Valley expedition, Coville says they seldom found it growing above the *Larrea* belt, but it occurs at different points along the railroad as far north as Walker lake, Nevada, a country in which *Larrea* does not seem to grow.

SPRENGERIA WATSONIANA Greene, Leaflets, 1: 199. 1906.

No. 8181, collected May 5, near Laws, Inyo county, in moist ground near an irrigating ditch. The plants were prostrate, large, often nearly a foot in diameter, the leaves "somewhat cuneate" as described, but more often toothed half way to the base instead of "about the summit," and there is no trace of the "more often quite entire and very acute." The pods are 2 mm. long and as wide. It also grows in dry ground and then is very small and dwarfed, often not over an inch high and little branched. The type was collected by Watson about Humboldt Lake, Nevada. Our specimens were at first referred to *S. minuscula*, which is found further south, but that is said to have "racemes distinctly elongated and longer than broad," the only distinguishing character in the description, and in this ours do not agree.

HUTCHINSIA PROCUMBENS (L.) DC. in Desv. Journ. Bot. 3: 168.

1814.

Lepidium procumbens L. Sp. Pl. 643. 1753.*Capsella elliptica* C. A. Meyer, Ledeb. Fl. Alt. 3: 199.

1831.

Capsella procumbens Fries, Novit. Fl. Suec. Mant. 1: 14.

1832.

Hymenolobus divaricatus Nutt.; T. & G. Fl. N. A. 1: 117.

1838.

Hymenolobus erectus Nutt. l. c.*Capsella divaricata* Walp. Rep. 1: 175.*Bursa divaricata* Kuntze, Rev. Gen. Pl. 21. 1891.

No. 8326, collected May 23, in the foothills west of Bishop, Inyo county, in somewhat peaty soil. The slender stems were erect from a decumbent base, quite different in habit from plants which grow near the shore at Pacific Grove, and are truly procumbent. Type locality "Monspelii."

THYSANOCARPUS PULCHELLUS F. & M. Ind. Sem. Hort. Petrop. 2: 50. 1835.

Thysanocarpus curvipes var. *pulchellus* Greene, Fl. Fran. 276. 1891.

No. 8171, collected April 12, in Madera county on grassy hills near the San Joaquin river about four miles above Pollasky. The original had "siliculis glaberrimis" and "styloque longe exserto terminatis." These specimens have pubescent fruits, and style not exserted. The type came from Fort Ross, Sonoma county.

THYSANOCARPUS ELEGANS F. & M. Ind. Sem. Hort. Petrop. 2: 50. 1835.

Thysanocarpus curvipes var. *elegans* Robinson, Syn. Fl. 1: Part I, 114. 1895.

No. 8140, collected April 11, in Madera county on grassy hills near the San Joaquin river about three miles above Pollasky. The original, collected at Fort Ross, Sonoma county, had "siliculis glaberrimis" while in these specimens it is tomentose, and this pubescent fruited form seems to be commoner.

SOPHIA SONNEI (Robinson) Greene, Pittonia, 3: 95. 1896.

Sisymbrium incisum var. *Sonnei* Robinson, Syn. Fl. 1: 140. 1895.

No. 8363, collected May 31, in coarse granite sand in the foothills west of Bishop. Our specimens resemble one named as this species by Professor Greene, collected by C. F. Baker in western Nevada. The type was collected by C. F. Sonne in the "Sierra Nevada mountains at Truckee, Calif."

SOPHIA CALIFORNICA (T. & G.) Rydb.

No. 8218, collected May 9, in Silver canyon in the White mountains opposite Laws, Inyo county, growing in gravel on the floor of the canyon. Plentiful there as well as west of Bishop in granite. The plants are greener and less pubescent than my no. 7763, collected near Mojave last year, but appear to be the same.

Phoenicaulis pedicellata (Aven Nelson)

Arabis pedicellata Aven Nelson, Proc. Biol. Soc. Wash. **17**: 91. 1904.

Streptanthus pedicellatus Aven Nelson, l. c. 92.

No. 8293, collected May 21, in the first canyon south of Bishop, Inyo county, in the Sierra foothills on steep slopes in coarse granite sand. Our plant has somewhat broader and more obtuse leaves and apparently smaller flowers than Baker's 991, mentioned under this species by Nelson in Proc. Biol. Soc. Wash. **18**: 187. 1905. The type is no. 705, Kennedy and True, from Hunter creek canyon, near Reno, Nevada. This plant does not look like an *Arabis* in the field, and I think Nuttall's *Phoenicaulis* should be maintained. In accord with present day tendencies, several genera are liable to be segregated from *Arabis* in the near future.

ARABIS PULCHRA Jones; Wats. Proc. Am. Acad. **22**: 468. 1887.

No. 8191, collected May 7, on the steep slopes of Silver canyon in the White mountains opposite Laws, Inyo county, growing in slate formation. Rather plentiful but scattered, a few plants growing here and there about rocks. The original from "valleys of western Nevada."

ARABIS BECKWITHII Wats. Proc. Am. Acad. **22**: 467. 1887.

No. 8259, collected May 15, in the Sierra foothills near the county hospital at Big Pine, Inyo county, growing near rocks in coarse granite sand. The original was collected by Beckwith at Quartz mountain, Nevada.

CHEIRANTHUS PERENNIS (Wats.) Greene, Pittonia, **3**: 132. 1896
Erysimum asperum perenne Wats. in Coville, Proc. Biol.
 Soc. Wash. **7**: 70. 1892.

No. 8294, collected May 21, in the Sierra foothills in the first canyon south of Bishop, Inyo county, growing at an elevation of about 5000 feet on precipitous slopes in coarse granite sand. The determination is by no means positive, but our plant is near this species. The specimens seem to be of the season's growth, but otherwise agree fairly well with the illustration of the type, which was collected "between Mineral King and Farewell Gap, Sierra Nevada, Tulare County, California."

CAPPARIDACEAE

PERITOMA LUTEUM (Hook.) Raf. Sylv. Tellur. 112.

Cleome lutea Hook. Fl. Bor. Am. **1**: 70. *pl.* 25. 1830.

No. 8348, collected May 30, along the roadside near Bishop, Inyo county, but not plentiful. It is common along the banks of the Truckee river near Reno, Nevada.

CLEOMELLA PARVIFLORA Gray, Proc. Am. Acad. **6**: 520. 1865.

No. 8289, collected May 18, along the roadside near Bishop, Inyo county, in rather moist ground. Noticed at other places near Bishop, and is probably common. The type came from "Nevada, near Carson City."

CRASSULACEAE

DUDLEYA HELLERI Rose, Bull. N. Y. Bot. Gard. **3**: 27. 1903.

No. 8412, collected July 24, on sand hills near the edge of the woods beyond Point Pinos lighthouse near Pacific Grove, Monterey county. The specimens are from type locality, and so far as known, the only ones distributed. Early in July, 1903, living specimens from which the description was drawn were sent to Dr. J. N. Rose. It is rather plentiful about the edge of the woods, and plants very similar to it are found along the beach near the light house.

SAXIFRAGACEAE

LITHOPHRAGMA HETEROPHYLLA (H. & A.) T. & G. Fl. N. A.
1: 584. 1840.

Tellima heterophylla H. & A. Bot. Beech. 346. 1840.

No. 8149, collected April 11, above Pollasky, Fresno county, near the old bridge on the banks of the San Joaquin river, growing about rocks. The ovary is slightly adherent to the calyx, and the pedicels are variable in length, some of them 4 or 5 mm. long, and some even longer.

GROSSULARIACEAE

RIBES BRACHYANTHUM (Gray) Card, Bush Fruits, 460. 1898.

Ribes leptanthum var. *brachyanthum* Gray, Bot. Cal. 1:
205. 1876.

No. 8264, collected May 16, in Silver canyon in the White mountains opposite Laws, Inyo county, at an elevation of about 5500 feet. It is found here as low as 4500 feet, but was past flowering with well formed fruit at the lower elevations, while at the place where the specimens were collected it was in full flower, some of the bushes covered with the bright yellow blossoms. The type of this excellent species was collected near Carson City, Nevada. It has never been well described, so the following description, drawn up in the field, should be useful:

Shrub a meter or more in height, with numerous stout often downcurved branches, the old bark ashen, that of growing shoots straw-colored or sometimes with a tinge of brown, puberulent: leaf blades small, nearly orbicular in outline, the largest about 1 cm. across, frequently broader than long, more or less 3 to 5-lobed, the lobes cuneate, broad and rounded and usually again 2 or 3-lobed, either truncate or cordate at base; petioles 5 mm. or less in length, these as well as the blades shortly pubescent and glandular: infrastipular spines commonly 3, 1 cm. long, needle-like, pale: flowers single or in twos on short pedicels of 1 to 2 mm., subtended by broadly ovate or roundish pu-

berulent ciliate bracts 1 mm. high: calyx shortly pubescent but not glandular, the tube 3 mm. long and as broad, greenish yellow; segments bright yellow, spreading and slightly downcurved, 3 mm. long, less than 2 mm. wide, obtuse: petals yellow, oblong or somewhat spatulate, a little over 2 mm. long, less than 1 mm. wide, the apex rounded or somewhat truncate; all of the petals with edges touching, forming a raised ring or collar above the spreading calyx lobes, the orifice a little narrower than the base: stamens equaling but not exceeding the petals. filaments stout, 1 mm. long and as wide at base, about half as wide above, anthers 1 mm. long and as wide, pale: ovary with numerous stalked glands, also shortly pubescent.

No. 8226, collected May 10, in the Sierra foothills about three miles south of Bishop, Inyo county, growing about granite boulders, past flowering with well formed fruit, the berries about 7 mm. in diameter, covered with pale stalked glands. Noticed at several places in the Sierra foothills, and no doubt common.

RIBES CEREUM Dougl. Trans. Hort. Soc. 7: 512. 1830.

No. 8265, collected May 16, in Silver canyon in the White mountains opposite Laws, Inyo county, growing on the floor of the canyon in gravel, and no doubt brought down from higher altitudes, since only one bush was found. Our Californian form is not typical.

ROSACEAE

PERAPHYLLUM RAMOSISSIMUM Nutt. T. & G. Fl. N. A. 1: 474. 1840.

No. 8356, collected May 31, on the banks of Birch creek in the Sierra foothills west of Bishop, Inyo county, growing in granite sand. A shrub about five feet high reminding one of a wild plum when in bloom. The type was collected on "dry hill-sides near the Blue Mountains of the Oregon."

POTENTILLA PENNSYLVANICA L. Mant. 76. 1767. Form.

No. 8216, collected May 9, in Silver canyon in the White mountains opposite Laws, Inyo county, growing on the banks of a small stream, the plants low and matted together. Determined by Professor Greene, who says it "is what I think everybody has always called this, rightly or wrongly."

POTENTILLA PULCHERRIMA Lehm. Stirp. Pug. 2: 10. 1830.

No. 8351, collected May 30, in damp meadows near Bishop, Inyo county, and rather plentiful at this particular place. Commonly confused with *P. gracilis*. Determined by Professor Greene.

TRIDOPHYLLUM BIENNE Greene, Leaflets, 1: 189. 1906.

Potentilla biennis Greene, Fl. Fran. 65. 1891.

No. 8217, collected May 9, in Silver canyon in the White mountains opposite Laws, Inyo county, in moist soil on the banks of a small stream, but not plentiful. The writer also found it in 1903 on the east side of the Sierra at Donner Lake. The original from "moist places in the mountains, from Butte Co. to Kern and San Luis Obispo."

PURPUSIA SAXOSA Brandege, Bot. Gaz. 27: 446. 1899.

No. 8297, collected May 21, in the Sierra foothills in the first canyon south of Bishop, Inyo county, growing in crevices of granite rocks. Also seen under similar conditions west of Bishop. The type came from "Sheep Mountains, Nevada, at 4000-5000 feet altitude."

HORKELIA CALIFORNICA C. & S. Linnaea, 2: 26. 1827.

Potentilla Californica Greene, Pittonia, 1: 100. 1887.

No. 8374, collected June 8, on the San Bruno hills at Ocean View, San Francisco, where it is plentiful, as it is said to be in similar situations about the city when protected from stock. The type was collected at San Francisco.

HORKELIA SERICEA (Gray) Rydb. Bull. Torr. Club, **25**: 56. 1898.

Horkelia Californica var. *sericea* Gray, Proc. Am. Acad. **6**: 529. 1865.

Horkelia Kelloggii Greene, Bull. Cal. Acad. **2**: 416. 1887.

Potentilla Kelloggii Greene, Pittonia, **1**: 101. 1887.

No. 8380, collected June 8, in San Mateo county in sandy soil near Ocean View, San Francisco, on the Lake Merced side of the Ocean Shore tracks. The plants have numerous long procumbent branches, differing greatly from *H. californica* with its few short ascending branches. Determined by Professor Greene.

COLEOGYNE RAMOSISSIMA Torr. Pl. Frem. 8. 1853.

No. 8229, collected May 10, at the base of the Sierra foothills south of Bishop, Inyo county, growing in coarse granite sand. Plentiful in the vicinity on low hills and on the adjacent plain. The original came from the "sources of the Mojave and Virgin Rivers."

KUNZIA GLANDULOSA (Curran) Greene, Pittonia, **2**: 299. 1892.

Purshia glandulosa Curran, Bull. Cal. Acad. **1**: 53. 1885.

No. 8225, collected May 10, at the base of the Sierra foothills south of Bishop, Inyo county, and no doubt occurring all along the base of the mountains from this point southward to the original station "on the Mojave side of Tehachapi Pass," the exact location near Cameron station.

ROSA PINETORUM Heller, Muhlenbergia, **1**: 53. 1904.

No. 8413, collected July 24, in sandy pine woods near the Point Pinos light house not far from Pacific Grove, Monterey county. Fruiting specimens only were collected. This is the type locality, the original collected perhaps a mile further back in the woods.

AMYGDALACEAE

AMYGDALUS ANDERSONII (Gray) Greene, Fl. Fran. 49. 1891.

Prunus Andersonii Gray, Proc. Am. Acad. 7: 337. 1868.

No. 8186, collected May 5, along the base of the White mountains opposite Laws, Inyo county in slate formation. Also noticed at several places in the Sierra foothills west of Bishop in granite, at elevations of 4000 to 5000 feet. The type came from "foothills of the eastern side of the Sierra Nevada, near Carson."

FABACEAE

LUPINUS BENTHAMII Heller, Muhlenbergia, 2: 61. 1905.

Lupinus leptophyllus Benth. Trans. Hort. Soc. II. 1: 409. 1835; not C. & S. Linnaea, 5: 589. 1830.

No. 8136, collected April 11, in Madera county on grassy hillsides near the San Joaquin river about three miles above Pollasky. Abundant in colonies here and there on the hills. One of our handsomest species.

LUPINUS MICRANTHUS Dougl.

No. 8154, collected April 11, on hillsides near Pollasky, Fresno county. This is a larger flowered form than the type, and is common in the San Joaquin valley for some distance north of Fresno.

Lupinus superbus

Herbaceous perennial about 1 meter high, the stems stout, 1 cm. in diameter, hollow, rather brittle, glabrous or nearly so, greenish-yellow: leaflets normally 9, light green, elliptical-lanceolate, about 5 cm. long, 12 mm. wide at the middle, the uppermost little reduced, acute, armed with a sharp mucro over 1 mm. long, glabrous above, villous beneath; petioles of the lower leaves 1 dm. long, those of the uppermost half that length, all more or less pubescent with appressed hairs; stipules membranous, lanceolate, those of the lower leaves 1 cm. long, long acu-

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minate, those of the upper ones shorter, with less prolonged acumination: inflorescence 2 dm. long or less: flowers bright violet purple, dense but sub-verticillate on slender pubescent pedicels 3 or 4 mm. long: bracts linear setaceous, 6 or 7 mm. long, villous, deciduous: calyx 6 mm. long, silky, the hairs somewhat spreading, both lobes entire, acute, the upper with a short blunt and rounded spur-like base: corollas 12 mm. long and as deep, a space of 6 mm. between the tips of banner and wings, face of banner narrow, 2 mm. across, grooved, unspotted, the edges turned back and parallel for the whole distance, the space between 2 mm. wide; wings deep boat-shaped, narrowly inflated, closed all around except the space under the lower calyx lobe, the edges raised and sharp, the inner face next the banner 4 or 5 mm. across, with a groove on either side of the raised edges; keel glabrous, rather strongly curved, about 3 mm. deep at base, 4 mm. across the middle, from that point tapering to the acuminate purple apex: pods densely villous, immature ones 3 cm. long, 8 mm. wide, about 8-seeded, the seeds whitish, unspotted.

The type is no. 8349, collected May 30, 1906, in wet meadows about a mile northeast of Bishop, Inyo county, California. The spikes closely set with bright violet purple flowers give it a very ornamental appearance. It occurs in several meadows near Bishop. The relationship is with the group of which *L. polyphyllus* is the type.

Lupinus pratensis

Herbaceous perennial, many plants growing together in clumps: stems 7 or 8 dm. high, hollow, 7 or 8 mm. in diameter, not brittle, light green, pubescent with short appressed hairs, rather leafy: leaflets about 6, dull green, oblong-lanceolate, 5-7 cm. long, rarely 1 cm. wide, acute and with a short mucro, pubescent on both sides with scattered fine appressed hairs; petioles of lower leaves about 1 dm. long, the upper ones reduced: stipules narrowly lanceolate and acuminate, 5 or 6 mm. long,

appressed pubescent: flowers dense in spikes 1 dm. long: bracts persistent, 7 mm. long, the ovate base 4 mm. wide, tapering to the acuminate apex: pedicels short, about 3 mm. long, densely villous: calyx densely short villous, 7 mm. long, the lobes ovate, 4 mm. wide at base, sub-acute, the lower entire, the upper 2-toothed, the teeth 1 mm. long with no sinus between: corollas a little over 1 cm. long, 8 or 9 mm. deep, a space of 6 mm. between the apices of banner and wings, the banner about 2 mm. shorter than the wings, tawny from the beginning, the face narrow, 2 mm. wide, the edges turned back and meeting, somewhat in-rolled, not flaring at base; wings long boat-shaped, pale violet purple lined with dark veins, 6 mm. deep, the edges meeting except under the lower calyx lobe, raised into a sharp ridge, the inner face next the banner 4 mm. across, with a groove on either side of the ridge; keel heavily bearded in the upper two-thirds, broad, 3 mm. wide at base, 4 mm. deep for the greater part of its length, the purple apex acute.

The type is no. 8364, collected May 31, 1906, in the Sierra foothills west of Bishop, Inyo county, California, in "McGee's meadows" in wet sandy soil on the edge of a small stream. It is plentiful there, and also occurs along Bishop creek near Bishop. Like *L. polyphyllus* in habit, but not resembling it or any other species known to me.

Lupinus inyoensis

Herbaceous perennial with one or more slender (3 mm.) stems from the root, 5 or 6 dm. high, pubescent with short spreading hairs, leafy up to the inflorescence: leaflets about 8, oblanceolate, 3 cm. long, 5 mm. wide, the sub-acute apex with a mucro 1 mm. long, densely covered on both sides with sub-appressed hairs, midvein prominent: petioles of the lower leaves about 8 cm. long, the uppermost half that length: stipules 1 cm. long or less, half of the length adnate, the free portion subulate-acuminate: inflorescence 1 dm. long on peduncles 3 or 4 cm. long, the pubescence on the pedicels and calyx sub-appressed as

on the leaves: flowers pale violet-purple, sub-verticillate: bracts lanceolate, deciduous, equaling the pedicel of 4 mm.: calyx with lower lip 8 mm. long, lanceolate, 3 mm. wide at base, entire; upper lip 7 mm. long, more oblong in shape, the base with a prominent blunt spur, the apex two-toothed: corollas 1 cm. long, 8 or 9 mm. deep, width between tips of wings and banner 4 mm.; banner narrow with grooved face, 2 mm. wide at base, where it is marked with several purple dots, a little over 1 mm. wide at the top, edges turned back and parallel, standing a little over 1 mm. apart except at the slightly flaring base, in age meeting; wings inflated to short boat-shape, closed dorsally except the space under the lower calyx lobe, the edges raised and sharp, upper face next the banner nearly plane, 5 mm. across, the edges with a narrow slit between; keel sharply curved, bearded on the upper half, over 2 mm. wide across the base, 4 mm. deep across the middle, the purplish apex short acuminate.

The type is no. 8312, collected May 23, 1906, in the Sierra foothills west of Bishop, Inyo county, California, growing in sandy soil among low shrubs at "McGee's meadows" just below the house on the opposite side of Birch creek. It was at first thought to be *L. andersoni*, but does not at all agree with the description of that species, and does not seem referable to any other known species.

Lupinus hesperius

Tufted perennial: stem multicapital from a thick woody rootstock, 2 dm. high, covered at the base with the remains of old stems and leaves, villous with white spreading hairs, often bearing one or two branches near the base: leaves mostly basal, in length reaching to the inflorescence, the petioles of these about 8 cm. long, blade obovate or obovate-spatulate, 3 cm. long, 15 mm. or less wide, sub-acute white tomentose on both sides with longer villous hairs intermingled; stem leaves when present few, smaller, more oblanceolate: stipules setaceous-acuminate, 8 mm. long, densely villous: inflorescence 1 dm. long, ter-

minating the more or less scape-like stem: bracts deciduous, unknown: pedicels 3 or 4 mm. long, villous: flowers violet-blue, sub-verticillate: calyx villous, 7 mm. long, the lobes about equal, the lower lanceolate, acuminate, 3 mm. wide at base, the upper broad, 5 mm. wide at base, 2-lobed, the sinus 3 mm. deep, 2 mm. wide, the apices slightly incurved: corollas 15 mm. long, 12 mm. deep, with a space of 8 mm. between the apices of banner and wings; face of banner yellowish, purple dotted below where it is 4 mm. wide, tapering to less than 2 mm. above, the edges turned back and meeting in the upper half, the lower half flaring; wings inflated to deep boat-shape, 7 mm. deep, the edges not raised, meeting all around except for a narrow space extending a little above the lower calyx lobe, the face next the banner 5 mm. across, somewhat convex; keel lightly bearded in the upper half, 2 mm. deep at base, 5 mm. at the middle, then tapering gradually to the short-acuminate apex.

The type is no. 8359, collected May 31, 1906, in the Sierra foothills west of Bishop, Inyo county, California, about a mile beyond the house in "McGee's meadows," in coarse granite sand among low desert shrubs. In habit it is something like such species as *L. minimus*, *procerus*, etc., but not referable to any of them. Remarkable for its short, broad leaves and large flowers.

LUPINUS BRIDGESII (Wats.) Heller, *Muhlenbergia*, **1**: 112. 1905.

Lupinus albicaulis var. *Bridgesii* Wats. Proc. Am. Acad.

8: 527. 1873.

Lupinus formosus var. *Bridgesii* Greene, Fl. Fran. 42.

1891.

No. 8162, collected April 12, in Madera county, on high grassy hillsides near the San Joaquin river about five miles above Pollasky. Also noted along the river at Pollasky. Perhaps not this species, but resembling it more than any of the others.

LUPINUS FALLAX Greene, Erythea, 2: 119. 1894.

No. 8395, collected June 12, near the summit of Mt. Tamalpais, Marin county, the type locality. It is found at intervals along the railroad from the "double bow-knot" to near the summit.

LUPINUS EXCUBITUS Jones, Cont. West. Bot. 8: 26. 1898.

No. 8257, collected May 15, near the county hospital at Big Pine, Inyo county, growing in damp places along streams. A species related to *L. albifrons* but less shrubby, provided our determination is correct; if not *excubitus* it is undescribed. The type was collected at "Lone Pine, Inyo Co., Cal., on gravelly mesas 7000 ft. alt., May 14, 1897."

LUPINUS ODORATUS Heller, Muhlenbergia, 2: 71. 1905.

No. 8207, collected May 8, on the edge of the sand hills about three miles west of Laws, Inyo county, in fine granite sand. This beautiful species is common at intervals in Owen's valley, restricted to the areas of fine sand. It was noticed as far north as Benton, near the upper end of the valley at about 5000 feet. The type station at Kramer, in the Mojave desert, is at about 2600 or 2700 feet. The species is no doubt widely dispersed over the desert region.

LUPINUS DENSIFLORUS Benth.

No. 8174, collected April 13, in fields on the outskirts of Fresno, Fresno county. The typical form with purplish tinged flowers.

TRIFOLIUM NEOLAGOPUS Loja.

No. 8152, collected April 11, on gravelly hills along the San Joaquin river above Pollasky, Fresno county. The fresh flowers are deep purple in these specimens, the plants rather low and spreading.

TRIFOLIUM HEXANTHUM Greene, ined.

No. 8145, collected April 11, in Madera county along the San Joaquin river at the old bridge above Pollasky, growing in damp ground near pools.

TRIFOLIUM ACICULARE Nutt.

No. 8134, collected April 11, on grassy slopes in Madera county near the San Joaquin river about three miles above Pollasky, where it is plentiful. Determined by Professor Greene.

TRIFOLIUM ARIZONICUM Greene, *Erythraea*, **3**: 18. 1895.

No. 8307, collected May 22, in Silver canyon in the White mountains opposite Laws, Inyo county, growing in wet ground along a small stream. Far removed from the original station, "near Flagstaff, northern Arizona." Determined by Professor Greene. Since in the original diagnosis the floral characters are passed over lightly, the following drawn from living plants may be added:

Involucre narrow, composed of unequal spinulose lobes, the longest about 5 mm.: calyx 5 mm. long, faintly 10-nerved, the tube membranous, equaling the teeth, these subulate-attenuate, green, pointed with red: corollas 1 cm. long, the tube pale, the lower part of the petals lined and dotted with pale red, the upper parts whitish; banner standing away at an angle of about 45 degrees, oblong, 3 mm. wide, a little narrowed at the toothed apex, nearly plane; wings erect, oblong, narrow, about 1 mm. wide, 4 mm. long; keel 2 mm. long and about as deep for nearly its entire length, the dorsal side a little contracted at base and apex, the latter with a minute straight point.

TRIFOLIUM RUSBYI Greene, *Pittonia*, **1**: 5. 1887.

No. 8314, collected May 23, in the Sierra foothills west of Bishop, Inyo county, in grassy places on the banks of Birch creek; not plentiful. The flowers of the original, collected in "northern Arizona," are "salmon-color, distinctly pedicelled." Ours are pale violet purple, scarcely pedicelled. Determined by Professor Greene as probably belonging here.

Anisolotus brachycarpus (Benth.)

Hosackia brachycarpa Benth. Pl. Hartw. 306. 1849.

Lotus brachycarpus Wats. Bibl. Index, 225. 1878; not Hochst. 1842.

Lotus humistratus Greene, Pittonia, 2: 139. 1890.

No. 8390, collected June 12, near the summit of Mt. Tamalpais, Marin county, along the railroad in an open spot. The plants are less pubescent than usual. Perhaps introduced from the lowlands, but other species commonly found at lower elevations were also found on the mountain top.

PAROSELA WHEELERI Vail, Bull. Torr. Club, 24: 17. 1897.

No. 8236, collected May 11, at the base of the White mountains opposite Laws, Inyo county, in gravel. Plentiful in that part of Owen's valley, occurring as a low branching shrub about three feet high, the bright violet-purple flowers making it one of our handsomest shrubs. The original came from "Nevada, Wheeler expedition, 1872." The determination is not positive, but our plant has more in common with this species than with any of the others.

ASTRAGALUS BICRISTATUS Gray, Proc. Am. Acad. 19: 75. 1883.

No. 8319, collected May 23, in the foothills west of Bishop, Inyo county, in coarse granite sand. In the original "corolla ut videtur alba," while in ours it is pale violet-red, the pods mottled with red. The type came from the "San Bernardino Mountains, S. E. California, in a canyon on the Mohave side."

No. 8269, collected May 16, in Silver canyon in the White mountains opposite Laws, Inyo county, in gravel on the floor of the canyon, many stems in a clump from a woody root. Found in flower only, and probably some other species, being different in habit from no. 8319.

ASTRAGALUS ANDERSONII Gray, Proc. Am. Acad. **6**: 524. 1866.

Tragacantha Andersonii Kuntze, Rev. Gen. Pl. **2**: 943.
1891.

No. 8357, collected May 31, in the foothills west of Bishop, Inyo county, in coarse granite sand, and rather plentiful at an elevation of about 5500 feet. Determined by Professor Greene.

XYLOPHACOS PURSHII Dougl. *teste* Rydb. Fl. Colo. 207. 1906.

Astragalus Purshii Dougl.; Hook. Fl. Bor. Am. **1**: 152.
1830.

Tragacantha Purschii Kuntze, Rev. Gen. Pl. **2**: 917. 1891.

Phaca purshii Piper, Cont. U. S. Nat. Herb. **11**: 369. 1906.

No. 8318, collected May 23, in the foothills west of Bishop, Inyo county, in coarse granite sand, the plants prostrate. Plentiful at one place, elevation about 5000 feet. The type was collected "on the low hills of the Spokane River." Determined by Professor Greene.

Xylophacos coccineus (Brandegee)

Astragalus coccineus Brandegee, Zoe, **2**: 72. 1891.

Astragalus grandiflorus Wats. Proc. Am. Acad. **17**: 370.
1882; not Pall. 1800.

No. 8190, collected May 7, on the steep stony slopes of Silver canyon opposite Laws, Inyo county. Watson's type was collected in the "San Bernardino mountains, toward the Mohave Desert, at 5,000 feet altitude." The flowers of this handsome plant are totally different in structure from those of the species with which it has been associated, and if flower characters are to be taken into account, it may fall into some other genus.

Phaca franciscana (Sheldon)

Astragalus franciscanus Sheldon, Minn. Bot. Stud. **1**: 135.
1894.

No. 8385, collected June 8, in San Mateo county near Ocean View, San Francisco, on the Lake Merced side of the Ocean Shore tracks in sandy soil, where it is not uncommon, as in

other places about San Francisco. This is doubtless the plant Mr. Sheldon had in view when he coined the name, but I am not certain that it is the original *Astragalus Crotalariae* Gray, not Benth. At any rate the name needs transferring to *Phaca*.

HESPERASTRAGALUS GAMBELLIANUS (Sheldon) Heller, *Muhlenbergia*, 2: 87. 1905.

Astragalus gambellianus Sheldon, *Minn. Bot. Stud.* 1: 19. 1894,

Astragalus nigrescens Nutt. *Journ. Acad. Phila.* II. 1: 152.

1848; not Pall. 1800.

No. 8155, collected April 11, on gravelly hillsides near Polasky, Fresno county. The species is widely distributed in California, occurring as far north as Redding at the upper end of the Sacramento valley, and is common in the San Francisco bay region. The type came from Catalina island.

Hesperastragalus compactus

Annual, diffusely branched from the base, 2 or 3 dm. high (or less) and as broad, the slender stems strigose: leaves oblong, the largest 3 or 4 cm. long, with 5 to 7 pairs of leaflets; petioles 5 or 6 mm. long; leaflets oblong or somewhat elliptical, 5-7 mm. long, 2-3 mm. wide, commonly emarginate, strigose on both surfaces, especially below, not crowded, petiolules less than 1 mm. long; stipules 2 mm. long, short-acuminate from a broad triangular base 2 mm. wide, pubescent like the stems: flower heads short conical, about 7 mm. long and as wide at base, somewhat larger in fruit, usually one from each leaf axis, the slender peduncles often twice the length of the leaves: calyx 3 mm. long, densely covered with black strigose hairs: flowers small, violet-blue, the banner almost plane, only slightly concave on the back with rounded entire apex; wings about one-fourth shorter than the banner, standing almost parallel to it and away from the keel; keel equaling the wings, broad in proportion to the flower, the hooded apex a little deeper than the body: pods densely strigose with whitish hairs, obovoid-oblong in shape, 4 mm. long,

2 mm. wide at base, 3 mm. at apex, convex dorsally and roughened with transverse ridges, the two cells closely pressed against each other, appearing as if only one, but readily separating.

The type is no. 8156, collected April 11, 1906, on grassy hills near Pollasky, Fresno county, California. It is rather common in the vicinity having been noticed two or three miles above on the other side of the San Joaquin river in Madera county. It was at once recognized as different from any of the forms of *H. didymocarpus* hitherto observed by the short compact fruiting heads, and the densely white-pubescent pods much exserted from the calyx. Although the flowering calyx measures only a little less in length than the pod, the breadth of the pod distends it and causes it to appear very short.

VICIA LINEARIS (Nutt.) Greene, Fl. Fran. 3. 1891.

Lathyrus linearis Nutt.; T. & G. Fl. N. A. 1: 276. 1838.

Vicia Americana var. *linearis* Wats. Proc. Am. Acad. 11: 134. 1876.

No. 8345, collected May 30, in sandy soil west of Bishop, Inyo county, in low moist places along the roadside. The type came from "plains of the Platte."

POLYGALACEAE

POLYGALA CALIFORNICA Nutt.; T. & G. Fl. N. A. 1: 671. 1840.

Polygala cucullata Benth. Pl. Hartw. 299. 1849.

No. 8404, collected June 12, near the summit of Mt. Tamalpais, Marin county, in an open place along the railroad. Not uncommon in the north Coast Range, preferring clayey soil. Nuttall perhaps collected the type near Monterey, where Hartweg collected *P. cucullata*, but the exact station is not given.

RHAMNACEAE

RHAMNUS CALIFORNICA Esch. Mem. Acad. Petrop. **10**: 281. 1826.

Rhamnus oleifolia Hook. Fl. Bor. Am. **1**: 123. *pl.* 44. 1830.

Rhamnus laurifolia Nutt.; T. & G. Fl. N. A. **1**: 260. 1838.

No. 8388, collected June 12, near the summit of Mt. Tamalpais, Marin county, in flower. This station, at almost 3000 feet was an unexpected one, since the typical plant grows on sand hills near the coast, the original from San Francisco.

No. 8417, collected July 31, near Del Monte, Monterey county, in sand along the railroad. This is perhaps the plant called *R. laurifolia* by Nuttall, collected near Monterey, but it does not seem to be distinct. It occurs here as symmetrical clumps of shrubs, six or seven feet high.

No. 8418, collected July 31, near Del Monte, Monterey county, in sand along the railroad, the leaves whitened underneath but not tomentellus. Probably the form called *R. oleifolia*, but in the fruiting state there is no discernible difference except the whitened under side of the leaf. It grew only a few feet from no. 8417, resembling it in habit and appearance, differing only in the color of the under side of the leaf.

RHAMNUS CUSPIDATA Greene, Leaflets, **1**: 64. 1904.

No. 8139, collected April 11, in Madera county, on grassy slopes near the San Joaquin river about three miles above Polasky. A large spreading shrub growing in clumps, about ten feet high. This was at once recognized as differing from any form seen by the writer in its peculiar spreading habit, gray bark, shape and pubescence of the leaves. The type was collected "near Tehachapi," Kern county.

CEANOTHUS VESTITUS Greene, Pittonia, **2**: 101. 1890.

No. 8223, collected May 10, along the base of the foothills south of Bishop, Inyo county, growing in coarse granite sand.

In the Synoptical Flora, page 416, this is referred to as a possible hybrid of *C. cuneatus* and *crassifolius*, and in my notes, probably taken from a specimen in the herbarium of the University of California, I have written, "said to be a hybrid with *C. cordulatus*." It certainly is not a hybrid here, for no other member of the genus grows in the vicinity. The type came from "borders of pine forests on the mountains near Tehachapi, Kern Co., Calif."

CEANOTHUS DIVARICATUS Nutt.; T. & G. Fl. N. A. **1**: 266.
1838.

No. 8148, collected April 11, on the banks of the San Joaquin river at the old bridge above Pollasky, Fresno county. The type came from "mountains of St. Barbara, California, and also near the town."

CEANOTHUS FOLIOSUS Parry, Proc. Davenp. Acad. **5**: 172. 1889.

No. 8393, collected June 12, near the summit of Mt. Tamalpais, Marin county, where it is plentiful, in fruit at this time. The type was collected near St. Helena, Napa county, and it is not uncommon on the mountains of Marin, Napa and Sonoma counties.

MALVACEAE

EREMALCHE EXILIS (Gray) Greene, Leaflets, **1**: 208. 1906.

Malvastrum exile Gray, Ives Rep. 8. 1860.

No. 8250, collected May 14, on the Red Hill west of Bishop, Inyo county, in volcanic detritus where it is plentiful, the plants procumbent. Common in the desert region.

MALVASTRUM MUNROANUM (Dougl.) Spach, Hist. Veg. **3**: 353.
1834.

Malva Munroana Dougl.; Lindl. Bot. Reg. **16**: pl. 1306.

1830.

No. 8367, collected June 5, near Mina, Esmeralda county, Nevada, on dry gravelly hillsides. A common species of the

Great Basin, noticed all along the railroad between Laws and Reno. The type was collected "upon the barren plains of the Columbia."

HYPERICACEAE

HYPERICUM CONCINNUM Benth. Pl. Hartw. 300. 1849.

No. 8399, collected June 12, near the summit of Mt. Tamalpais, Marin county. This is a beautiful plant well worthy of cultivation, covered as it is with large golden yellow flowers. The plants are low and tufted, spreading. The type is said to have been collected "in valle Sacramento," but there must be an error, unless Hartweg got it on the Marysville Buttes. Not uncommon at medium elevations in the Coast Range north of San Francisco.

FRANKENIACEAE

FRANKENIA GRANDIFOLIA C. & S. Linnaea, 1: 35. 1826.

No. 8407, collected July 24, near the Point Pinos light house, Monterey county, in grassy places on the edge of a pond not far from the beach. Plentiful, the plants matted together, rather weak and reclining, less woody, and the leaves broader and thinner than in a specimen from Half Moon bay, San Mateo county.

LOASACEAE

ACROLASIA NITENS (Greene) Rydb. Bull. Torr. Club, 30: 278.

1903.

Mentzelia nitens Greene, Fl. Fran. 234. 1891.

No. 8197, collected May 8, on the edge of the sand hills about three miles west of Laws, Inyo county, in fine granite sand. The large flowers are bright golden yellow, open during the middle of the day, from ten o'clock until three, if that long. Plentiful where it occurs, but that is only at intervals in beds of fine sand. The type was collected some thirty miles north, "near Benton, Mono Co."

ACROLASIA CONGESTA (Nutt.) Rydb. Bull. Torr. Club, **30**: 278.

1903.

Mentzelia congesta Nutt.; T. & G. Fl. N. A. **1**: 534. 1840.

No. 8361, collected May 31, in the foothills west of Bishop, Inyo county, in coarse granite sand, the plants scattered, seldom many growing near together. It is either rare or overlooked, since but few collections of it have been made west of the Rocky mountains. The type came from "Rocky Mountains, on Lewis River, rare."

ACROLASIA ALBICAULIS (Dougl.) Rydb. Bull. Torr. Club, **30**:

278. 1903.

Bartonia albicaulis Dougl.; Hook. Fl. Bor. Am. **1**: 222.

1833.

Mentzelia albicaulis Dougl. l. c.

No. 8232, collected May 11, at the base of the White mountains opposite Laws, Inyo county. It is plentiful in that part of Owen's valley on both the east and west sides, the flowers open during the middle of the day. The type was collected "on arid sandy plains of the river Columbia."

EPILOBIACEAE

EPILOBIUM FRANCISCANUM Barbey, Bot. Cal. **1**: 220. 1876.

No. 8377, collected June 8, in San Mateo county near Ocean View, San Francisco, in wet places along the Southern Pacific tracks. From type locality, "near San Francisco." It ranges north to Washington along the coast.

GODETIA QUADRIVULNERA (Dougl.) Spach

No. 8382, collected June 8, in San Mateo county near Ocean View, San Francisco, on the Lake Merced side of the Ocean Shore tracks in sandy soil. The body of the petals is about 12 mm. long in these specimens. The type came from "northwest America," collected by Douglas.

No. 8384, collected June 8, in San Mateo county near Ocean View, San Francisco, on the Lake Merced side of the Ocean Shore tracks, growing near no. 8382, but has petals only half as large. The two looked different in the field, but in the dried state seem to be the same species. The species of *Godetia* have been so confused in literature that accurate determinations are impossible without a careful revision of the genus.

Anogra longiflora

Acaulescent, apparently annual, with a vertical root about 5 mm. thick at the crown: leaves ascending, about 1 dm. long, half of which is petiole, the blade oblong-lanceolate, 2 cm. wide or less, narrowed into the petiole, the apex acute, the margins with short spreading distant teeth and sometimes slightly runcinate, more or less papillose roughened on both sides, the margins sparingly short ciliate: calyx glabrous, the tube 1 dm. long, cylindrical except near the top, where it is dilated to funnel-form, the broadest part 15 mm. wide; the lobes finally reflexed, 3 cm. long, lanceolate, acuminate, nearly 1 cm. wide at base, the tips not free in the bud: corollas large, white, fading pink, the petals broadly cuneate, 5 cm. long, about 4 cm. wide across the eroded top: filaments subulate, 3 cm. long; anthers linear, 15 mm. long, affixed at the middle: style a little exceeding the stamens; stigma 4 cleft, the lobes 5 mm. long, spreading: ovary somewhat glandular, the valves apparently not winged.

The type is no. 8219, collected May 9, 1906, in Silver canyon opposite Laws, Inyo county, California, in the White mountains on steep slopes in shale. The flowers are nocturnal, but remain open during part of the following morning. According to Britton, Ill. Fl. 2: 488, the genus is composed of "caulescent herbs," with flowers "diurnal." Our Californian plants do not accord with these characters, for *A. californica* and *xylocarpa* are both acaulescent, the former nocturnal as observed by myself. In The Plant World, 1: 22. 1897, I have recorded the fact that *A. albicaulis* is nocturnal, and no doubt a little careful

observation will show that this character pertains to the whole genus. *A. longiflora* is readily distinguished from the other acaulescent species by its smoothness and practically entire leaves.

SPHAEROSTIGMA CONTORTUM (Dougl.) Walp.

No. 8288, collected May 18, in coarse granite sand in the Sierra foothills west of Bishop, Inyo county. The pods in these specimens are sessile, hardly contorted, either straight or a little curved, ascending, about 2 cm. long, not narrowed at the apex. Perhaps a distinct species.

SPHAEROSTIGMA HIRTELLUM (Greene) Small, Bull. Torr. Club,
23: 190. 1896.

Oenothera hirtella Greene, Fl. Fran. 215. 1891.

No. 8166, collected April 12, in Madera county on gravelly hillsides along the San Joaquin river about five miles above Polasky. The given range is "common in the hill country away from the sea, from Lake Co. and Solano southward." Our plant has a smooth stem, all the pods except the lowermost glabrous, and the leaves narrower than the type. Probably undescribed, but referred here for the present.

SPHAEROSTIGMA BOOTHII (Dougl.) Walp. Rep. **2**: 77. 1843.

Oenothera Boothii Dougl.; Lehm. in Hook. Fl. Bor. Am.

1: 213. 1833.

Oenothera pygmaea Dougl. l. c.

Oenothera lithospermoides Nutt.; Wats. Proc. Am. Acad.

8: 604. 1873.

No. 8238, collected May 11, along the base of the White mountains opposite Laws, Inyo county, in gravel and sand. The capsules are immature and are not much enlarged at base, so it is referred here with some doubt. The type was collected "on low exposed gravelly hills, near the branches of Lewis and Clark's River, lat. 46 degrees north."

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CHYLISMA PTEROSPERMA (Wats.) Small, Bull. Torr. Club, **23**:
193. 1896.

Oenothera pterosperma Wats. Bot. King Rep. 112. *pl.* 14.
1871.

Sphaerostigma pterospermum Aven Nelson, Bot. Gaz. **40**:
63. 1905.

No. 8276, collected May 18, in the Sierra foothills west of Bishop, Inyo county, in coarse granite sand on a steep slope above Birch creek. This inconspicuous species was not plentiful here, and was not noticed elsewhere. The type was "growing under sage brush, Trinity Mountains, Nevada, 5000 feet altitude; May."

Chylisma lancifolia

Caulescent annual 3 dm. high, sparingly branched from the base, the stems puberulent, purplish below green above: leaves mostly basal, the largest 6 or 7 cm. long, the blade lanceolate, 3 cm. long, 12 mm. wide, short acuminate, the base abruptly narrowed to the petiole and commonly oblique on one side, the edges with short and distant spreading teeth, puberulent on both sides, the veins prominent beneath: inflorescence glabrous, at length 1 dm. long, a few of the bracts under the lowermost pedicels like small leaves, the others setaceous, 2 or 3 mm. long: flowers yellow, in crowded nodding clusters: calyx 7 or 8 mm. long in the bud, the tube equaling or a little shorter than the lobes, funnelform, 3 mm. wide across the top, the lobes lanceolate, acute, at length reflexed: petals broader than long, 4 mm. broad, 3 mm. long, rounded and blunt at top, practically no claw at base: stamens a little longer than the petals: style exerted beyond the stamens; stigma capitate: mature fruiting pedicels 10 or 12 mm. long, horizontal or ascending, the pods ascending, a little longer than the pedicels, 3 mm. thick, very little narrowed at apex, prominently pale veined: seeds pale yellow-brown, oblong-ovoid, 1 mm. long, smooth.

The type is no. 8231, collected May 11, 1906, near Laws, Inyo county, California, in sandy soil along an irrigating ditch. Not uncommon in that part of Owen's valley. In Small's key in Bull. Torr. Club, **23**: 192-193, this species would come near *C. heterochroma* and *C. parryi* in shape of leaf, but agrees with neither.

AMMIACEAE

BOWLESIA SEPTENTRIONALIS C. & R.

No. 8150, collected April 11, on the banks of the San Joaquin river at the old bridge above Pollasky, Fresno county, in rich soil under an oak tree near rocks, the plants weak and matted together.

SANICULA TUBEROSA Torr. Pac. R. R. Rep. **4**: 91. 1857.

No. 8172, collected April 12, on grassy slopes under trees in Madera county about four miles above Pollasky. Considerably taller and more slender than specimens collected in 1903 at Donner Lake. The type came from "hillsides, Duffield's Ranch, Sierra Nevada," near the present town of Auburn, Placer county. Determined by Dr. J. N. Rose.

LIGUSTICUM HELLERI C. & R. ined.

No. 8372, collected June 8, on the western end of the San Bruno hills at Ocean View, San Francisco. Rather plentiful, growing in a tangle of other vegetation.

LOMATIUM PARISHII C. & R. Cont. U. S. Nat. Herb. **7**: 235. 1900.

Peucedanum Parishii C. & R. Bot. Gaz. **13**: 209. 1888.

No. 8355, collected May 31, in the foothills west of Bishop, Inyo county, in coarse granite sand, elevation about 5000 feet. Locally plentiful. The type was collected in "Bear Valley," San Bernardino county, on rocky hillsides. At our station the plants grew on the ascending plain which at this place extends up among the foothills. Determined by Dr. J. N. Rose.

EURYPTERA PARVIFOLIA (H. & A.) C. & R. Cont. U. S. Nat. Herb. **7**: 241. 1900.

Ferula parvifolia H. & A. Bot. Beech. 348. 1840.

Peucedanum parvifolia T. & G. Fl. N. A. **1**: 628. 1840.

Peucedanum Californicum C. & R. Bot. Gaz. **13**: 143. 1888.

No. 8420, collected July 31, along the railroad about two miles northeast of Del Monte, Monterey county, in the sand hills. It is rather plentiful in the pine woods back of Monterey toward Pacific Grove, which is no doubt the type locality.

OLEACEAE

MENODORA SPINESCENS Gray, Proc. Am. Acad. **7**: 388. 1868.

No. 8202, collected May 8, on the edge of the sand hills about three miles west of Laws, Inyo county, and observed at various other places in the neighborhood. The type came from "canyons and hillsides, southeastern part of the State of Nevada." It is apparently not rare in the desert region, but seldom collected.

POLEMONIACEAE

Phlox longituba

Suffrutescent perennial 1 to 4 dm. high, branched above, the slender woody stems covered with gray flaky bark, only the herbaceous young branches pubescent and glandular, the pubescence of short, spreading chaffy hairs: leaves lanceolate or linear-lanceolate, 3 cm. or less long, 5 mm. or less wide, more or less pubescent with chaffy hairs, scabrous to the touch, the sessile base slightly clasping, the apex short-acuminate, apiculate, the margins slightly inrolled, midvein rather prominent beneath; all but the uppermost internodes equaling or a little exceeding the leaves: pedicels slender, 7 to 10 mm. long, glandular pubescent: calyx 7 to 10 mm. long, glandular pubescent, the scarious spaces between the ribs not replicate, but some of them appear-

ing so when distorted by pressure; teeth a little shorter than the tube, subulate, awn-tipped: corollas salmon-colored, glabrous, nearly 3 cm. long, the tube 2 to 2.5 cm. long, or nearly twice the length of the calyx, 1 mm. wide at base, gradually enlarged to 2 mm. at top; the spreading lobes oblong-spatulate, 1 cm. or less long, 3 or 4 mm. wide at the rounded and obtuse apex: stamens equaling the tube: style 2 or 3 mm. shorter than the stamens, the three slender stigmas 2 mm. long: ovules not seen.

The type is no. 8320, collected May 23, 1906, in the Sierra foothills west of Bishop, Inyo county, California, in coarse granite sand, commonly growing among and supported by shrubs, the lower part of the stem woody but weak and brittle. One or two plants were found growing out in the open, and these were low and diffuse. Its nearest relative is perhaps *P. stansburyi*, the type of which came from "gravelly hills near the Organ Mountains, New Mexico.

LEPTODACTYLON PATENS Heller, *Muhlenbergia*, 1: 146. 1906.

Gilia pungens var. *squarrosa* Gray, Proc. Am. Acad. 8: 267. 1870; not *Gilia squarrosa* H. & A.

No. 8292, collected May 21, in the first canyon in the Sierra foothills south of Bishop, Inyo county, in coarse granite sand about rocks, and plentiful there. The flowers are white, fading pinkish or purplish, especially along the outer edge of the petals. The corollas are 2 cm. long, the slender tube 1 cm. long, the open flower about 15 mm. across, the petals cuneate-obovate, somewhat unequal in width, 5 or 6 mm. wide across the rounded or truncate slightly eroded apex. Referred here with considerable doubt. The type was collected somewhere in the "arid districts of Nevada and Utah."

COLLOMIA HETEROPHYLLA Hook.

No. 8389, collected June 15, in an open place in rich soil near the summit of Mt. Tamalpais, Marin county. A polymorphous species.

GILIA STAMINEA Greene

No. 8167, collected April 12, in Madera county on gravelly hills near the San Joaquin river about five miles above Pollasky. These specimens have smoother calices than the typical plant, but do not seem referable to any other species.

GILIA LEPTOMERIA Gray, Proc. Am. Acad. **8**: 278. 1870.

No. 8344, collected May 29, near Laws, Inyo county, growing in sandy soil near the irrigating ditch east of the town. The type came from "mountain valleys of Nevada and Utah."

GILIA INCONSPICUA (J. E. Smith) Sweet

No. 8291, collected May 21, in the first canyon in the Sierras south of Bishop, Inyo county, growing in sand on steep slopes. Also not uncommon in similar situations near Bishop. The plants are glandular and woolly pubescent, especially below.

GILIA CAMPANULATA Gray, Proc. Am. Acad. **8**: 279. 1870.

No. 8281, collected May 18, in the foothills west of Bishop, in coarse granite sand. Plentiful locally. In habit and general appearance more resembling some of the species we have been calling *Linanthus*.

GILIA FILIFORMIS Parry; Gray, Proc. Am. Acad. **10**: 75. 1874.

No. 8220, collected May 9, in Silver canyon in the White mountains opposite Laws, Inyo county, growing on slopes in loose gravel. Plentiful locally. As noted by Coville in the report of the Death Valley expedition, the flowers are lemon yellow, and are not "very open campanulate," as described in the Synoptical Flora, but appear so when dry and distorted by pressure. In the living state they are narrow, cylindrical rather than campanulate. The type was collected in "southern Utah, on the detritus of volcanic rock."

Dactylophyllum parryae (Gray)

Gilia Parryae Gray, Proc. Am. Acad. **12**: 76. 1876.

Gilia Kennedyi Porter, Bot. Gaz. **2**: 77. 1877.

Linanthus Parryae Greene, Pittonia, **2**: 256. 1892.

No. 8200, collected May 8, in the sand hills about three miles west of Laws, Inyo county. Also plentiful here and there at other places in the vicinity, the flowers either violet blue or white. Apparently not hitherto reported from this section.

Dactylophyllum aureum (Nutt.)

Gilia aurea Journ. Acad. Phila. II. **1**: 155. *pl.* 12. 1848.

Linanthus aureus Greene, Pittonia, **2**: 257. 1892.

No. 8199, collected May 8, in the sand hills about three miles west of Laws, Inyo county. Common in that region as well as all through the desert, often growing in considerable colonies, the flowers bright golden yellow. The type was collected at "Santa Barbara."

Leptosiphon mariposianus (Milliken)

Linanthus Mariposianus Univ. Cal. Pub. Bot. **2**: 57. 1904.

No. 8164, collected April 12, in Madera county on grassy slopes overlooking the San Joaquin river about five miles above Pollasky. A handsome white flowered species, related to *L. androsaceus*. The type was collected by J. W. Congdon "below Mariposa, Mariposa Co."

LANGLOISIA SETOSISSIMA (T. & G.) Greene, Pittonia, **3**: 30. 1896.

Navarretia setosissima T. & G. Ives Rep. 22. 1860.

Gilia setosissima Gray, Proc. Am. Acad. **8**: 271. 1870.

No. 8308, collected May 22, about the mouth of Silver canyon in the White mountains opposite Laws, Inyo county, in gravel, some of the plants covering a space five or six inches in diameter. These specimens, in the early flowering stage, are more or less floccose on the stems, decidedly so on the leaves. The type was collected on "rocky hillsides," northwestern Arizona, on the Colorado river at the mouth of Diamond river.

LANGLOISIA PUNCTATA (Coville) Gooding, Bot. Gaz. **37**: 58.
1904.

Navarretia setosissima punctata Coville, Proc. Biol. Soc.
Wash. **6**: 72. 1892.

No. 8538, collected May 29, on the north slope above Silver canyon opposite Laws, Inyo county, in gravel; not common. This looks very different in the field from *L. setosissima*, has a shorter leaf of a duller green, and the spotted petals of a somewhat different shape. The type was collected in "Surprise Canyon, Panamint Mountains," Inyo county.

LANGLOISIA MATTHEWSII (Gray) Greene, Pittonia, **3**: 30. 1896.

Loeselia Matthewsii Gray, Bot. Cal. **2**: 466. 1880.

Navarretia matthewsii Coville, Cont. U. S. Nat. Herb. **4**:
153. 1893.

No. 8287, collected May 18, near the Sierra foothills on the rising plain west of Bishop, Inyo county, in coarse granite sand, the plants scattered and never plentiful at any one place. This species, with its irregular, almost bilabiate corolla, seems distinct generically from *L. setosissima*, although the habit and general appearance is much the same. The type was collected at "Camp Independence, Inyo County, California."

HYDROPHYLLACEAE

NEMOPHILA INSIGNIS Dougl.

No. 8132, collected April 11, in Madera county, on grassy slopes near the San Joaquin river about three miles above Polasky. Plentiful at this place, the plants growing in large colonies.

NEMOPHILA AURITA Lindl. Bot. Reg. *pl.* 1601. 1833.

No. 8147, collected April 11, in Madera county at the old bridge over the San Joaquin river above Pollasky, the plants clinging to shrubs and other vegetation. The type came from the coast region, perhaps from Monterey, where it is common.

NEMOPHILA PULCHELLA Eastw. Bull. Torr. Club, **28**: 157.
1901.

Nemophila exilis pulchella Chandler, Bot. Gaz. **34**: 214.
1902.

No. 8151, collected April 11, at the old river bridge above Pollasky, Fresno county, growing in masses about rocks, the place moist and sheltered. Determined by Mr. H. P. Chandler. Differing in some particulars from the type, collected at Sequoia Mills, Fresno county. The leaves do not conform to those of the original, the calyx lobes a little too broad, and the corolla white, smaller, with broader divisions, and seems to be uniformly hairy outside instead of "in lines." The stamens in our specimens are purple.

EUCRYPTA TORREYI (Gray) Heller, Cat. 7. 1898.

Ellisia (Eucrypta) Torreyi Gray, Proc. Am. Acad. **20**: 302.
1885.

Phacelia micrantha? var. *pinnatifida* Torr. Ives Rep. 20.
1860; not *P. bipinnatifida* Michx.

Macrocalyx bipinnatifidus Coville, Cont. U. S. Nat. Herb.
4: 157. 1893.

No. 8227, collected May 10, along the base of the Sierra foothills about three miles south of Bishop, Inyo county, growing about granite boulders; common in that neighborhood. It is the same as no. 7682, distributed last year as *E. micrantha*. The determination at the time was unsatisfactory, and recent investigation seems to point to this species. The type was collected in Arizona. It is no doubt a common plant in the desert region.

PHACELIA FREMONTII Torr.

No. 8185, collected May 5, along the base of the White mountains opposite Laws, Inyo county, growing in gravel and sand. Plentiful, as it is all through the desert region.

PHACELIA BICOLOR Torr. in Wats. Bot. King Rep. 255. 1871.

No. 8198, collected May 8, on the sand hills about three miles west of Laws, Inyo county, plentiful locally in fine sand. The corolla lobes are violet in these plants. The type was collected in "western Nevada, near Carson City.

No. 8285, collected May 18, in the foothills west of Bishop, Inyo county, on the banks of a small stream shaded by shrubs. The plants are greener than no. 8198, have broader leaf segments, and larger pinkish flowers.

PHACELIA SUAVEOLENS Greene, Pittonia, 1: 223. 1888.

No. 8391, collected June 12, near the summit of Mt. Tamalpais, Marin county, in rich ground in an open place. An unexpected station for this rare plant, hitherto known only from the type collection from the "Petrified Forest, Sonoma County." A large diffuse plant with numerous procumbent stems from one root. Determined by Professor Greene.

PHACELIA CALIFORNICA Cham. Linnaea, 4: 495. 1829.

No. 8405, collected June 12, along the railroad near the summit of Mt. Tamalpais, Marin county. San Francisco is the original locality for this species, and it is rather common in sand near Lake Merced, as it no doubt is at other places about the city. Its occurrence near the summit of Tamalpais was a surprise. The plants are more slender than the typical form, but seem to belong here.

PHACELIA PLATYLOBA Gray

No. 8163, collected April 12, on a high ridge overlooking the San Joaquin river in Madera county, about five miles above Pollasky, growing in rich soil under shrubs, the plants slender. This is the typical plant, the peculiar unevenness of the calyx which suggested the name quite prominent.

PHACELIA TANACETIFOLIA Benth.

No. 8178, collected April 14, near Tracy, Contra Costa county along the Niles branch of the railroad. It is abundant for some distance along the railroad as well as in adjacent fields. The type perhaps came from this region. The bright violet purple flowers lose much of their beauty in drying.

PHACELIA CRYPTANTHA Greene, Pittonia, 5: 21. 1902.

Phacelia hispida brachyantha Coville, Cont. U. S. Nat. Herb. 4: 158. 1893.

No. 8255, collected May 14, on the Red Hill west of Bishop, Inyo county, growing about low shrubs in gravel and sand. It is rather common in the vicinity. The leaf divisions are often but not always acute, and the corollas a little longer than the calyx, in which it differs from the type, collected in "Surprise Canyon, Panamint Mountains, Inyo County, California." The name *brachyantha* is no doubt preoccupied in the genus, since it is not used by Greene.

PHACELIA CICUTARIA Greene, Pittonia, 5: 20. 1902.

No. 8146, collected April 11, in Madera county, at the old river bridge above Pollasky. This is not altogether typical, but is referred here for the present. The same thing was distributed last year under the name *P. hispida*, no. 7611, although at the time I considered it distinct. It may be found in various collections as *P. hispida*, but that is a very different plant.

PHACELIA CURVIPES Torr, Bot. King Rep. 252. 1871.

No. 8228, collected May 10, along the base of the Sierra foothills about three miles south of Bishop. Plentiful, as it is at other places in the vicinity. The original is described as "soft pubescent and somewhat pilose," while ours is distinctly hispid. The type was collected on "foot-hills near Carson and Washoe Cities," Nevada.

Phacelia pratensis

Annual, branched from the base, the branches curved-ascending, 1 dm. high and as broad across the top, all parts pilose except the corolla lobes: leaves entire, oblanceolate, the few basal ones 5 cm. long, the blade half that length, 6 mm. wide; those of the stem half as long as the basal ones, but little reduced in width, all sub-acute: racemes 3 or 4 cm. long, rather loose, lower pedicels 8 mm. long, the upper a little more than half that length: calyx 6 mm. long, the lobes linear-oblong, 1 mm wide, very slightly narrowed at base, the apex sub-acute: corollas large for the plant, 1 cm. high, broadly open campanulate, 12 or 13 mm. across, the throat white, the lobes bright violet blue, broad and rounded, 4 mm. long, 5 mm. wide, glabrous externally and internally; stamens equaling the corolla tube, the filaments bearded for two-thirds their length; anthers oblong, purplish: style two-cleft to the middle, a little shorter than the stamens.

The type is no. 8273, collected May 18, 1906, in the Sierra foothills west of Bishop, Inyo county, California, at the lower end of "McGee's meadows," in moist grassy places on the banks of Birch creek. It is more or less related to *P. curvipes* which grows in the vicinity in dry sandy places, but is distinguished by the larger, longer, paler flower, and the absence of curved pedicels.

EMMENANTHE PENDULIFLORA Benth.

No. 8339, collected May 29, on the slope north of Silver canyon opposite Laws, Inyo county, growing about rocks. A widely distributed species, equally at home on the desert mountains as well as in the more humid coast region.

MILTITZIA LUTEA (H. & A.) A. DC. Prodr. 9: 296.

Eutocia? lutea H. & A. Bot. Beech. 373. 1840.

Emmenanthe lutea Gray, Syn. Fl. 2: Part 1, 170. 1878.

No. 8324, collected May 23, in the foothills west of Bishop, Inyo county, in a small dry peat bog among the granite sands.

The specimens do not altogether fit the description in the Synoptical Flora, but are nearer this species than any other.

Conanthus Wats. Bot. King Rep. 256. 1871

Thirteen years ago, in Cont. U. S. Nat. Herb. **4**: 161-162, Mr. Coville called attention to the fact that this genus and our western plants formerly called *Nama* are not sufficiently distinct to be kept apart, the weak character of united or separate styles failing in one species, but strangely referred the type of *Conanthus* to Kuntze's *Marilaunidium*. Most botanists in this country have persisted in using Kuntze's name, but apparently without giving due study to the plants. A careful examination of flowers from all the species will no doubt show that more of them have united styles, and even if it does not, the character is not strong enough to separate plants so like in habit and aspect. But I am of the opinion that a little careful work will demonstrate the fact that if the name *Marilaunidium* is to be used at all, it must be restricted to the plant of the southeastern United States and the West Indies, the original *Nama jamaicense* L.

CONANTHUS PUSILLUS Lemmon, in Heller, Cat. 6. 1898.

Nama pusillum Lemmon, in Gray, Proc. Am. Acad. **20**: 304. 1885.

No. 8325, collected May 23, in a small dry peat bog in the Sierra foothills west of Bishop, Inyo county. A homely little plant, the type collected in the Mojave desert near the Calico mine, San Bernardino county.

CONANTHUS DEMISSUS (Gray) Heller, Cat. 6. 1898.

Nama demissum Gray, Proc. Am. Acad. **8**: 283. 1870.

Marilaunidium demissum Kuntze, Rev. Gen. Pl. **2**: 434. 1891.

No. 8280, collected May 18, in the foothills west of Bishop, Inyo county, plentiful in coarse granite sand. This may not be the typical plant, but our specimens are the same as others bearing this name. All of the flowers examined have two distinct styles. The type was collected in "dry or desert regions of Nevada."

Conanthus multiflorus

Annual, prostrate, branched from the base, the purplish branches several times dichotomous, about 1 dm. long (thus the diameter of the plant-mat 2 dm), more or less strigose, lower internodes rather long, 2 or 3 cm., giving the lower part of the stem a naked appearance: leaves crowded toward the ends of the branches, linear or linear-spatulate, about 15 mm. long, 1 to 2 mm. wide, acute, coarsely hirsute with spreading hairs: flowers solitary in the axils on pedicels barely 1 mm. long, like the leaves crowded and numerous near the ends of the branches: calyx 5-divided, 6 mm. long in fruit, the lobes linear, less than 1 mm. wide, hispid with long hairs: corollas large, 1 cm. long, 15 mm. wide when expanded, the tubular funnelform tube yellowish, pubescent with scattered spreading hairs, the rounded obovate lobes pale violet-purple: stamens unequal, extending a little above the middle of the corolla tube: style two-lobed, about equal with the lower stamens: pod oblong, 3 mm. long; the pale brown oblong seeds rugose.

The type is no. 8286, collected May 18, 1906, in the Sierra foothills west of Bishop, Inyo county, California, in sand, in company with no. 8280, the plant listed above as *C. demissus*, but readily distinguished by its larger size, larger and paler flowers, and single, merely lobed style. It must bear considerable resemblance to *C. aretioides*, the type of the genus, but according to Watson that has "smooth waxy seeds."

TRICARDIA WATSONI Torr. Bot. King Rep. 258. *pl.* 24. 1871.

No. 8214, collected May 9, in Silver canyon in the White mountains opposite Laws. Inyo county, growing on the floor of the canyon in gravel and abundant at one place. It is a strange looking plant, the enlarged calyx lobes in the fruiting stage suggesting the Nyctaginaceæ. The type was collected "on foot-hills of Truckee Pass and the Trinity Mountains, Western Nevada."

ERIODICTYON CALIFORNICUM (H. & A.) Greene

No. 8394, collected June 12, near the summit of Mt. Tamalpais, Marin county. This is a polymorphous species, but the different forms do not appear separable. The type was collected in this region.

BORRAGINACEÆ

Tiquiliopsis

Coldenia § *Tiquiliopsis* Gray, Proc. Am. Acad. **5**: 341. 1862.

Tiquiliopsis nuttallii (Hook.)

Coldenia? *Nuttallii* Hook. Kew. Journ. Bot. **3**: 296. 1851.

Tiquilia brevifolia Nutt.; Torr. Bot. Mex. Bound. 136. 1859.

No. 8347, collected May 30, along the base of the sand hills west of Bishop, Inyo county. Plentiful locally, and distributed throughout the Great Basin region.

HELIOTROPIMUM OCULATUM Heller

No. 8408, collected July 24, in moist sandy places on the borders of a pond near Point Pinos light house, Monterey county. Referred here provisionally, since it is not typical.

PECTOCARYA SETOSA Gray, Proc. Am. Acad. **12**: 81. 1876.

No. 8187, collected May 7, on stony slopes in Silver canyon opposite Laws, Inyo county. Rather plentiful. The type was collected in "S. E. California, on the desert plains of the upper Mohave River." Determined by Professor Greene.

LAPPULA OCCIDENTALIS (Wats.) Greene, Pittonia, **4**: 97. 1899.

Echinosperrum Redowskii var. *occidentale* Wats. Bot. King Rep. 246. 1871.

No. 8271, collected May 16, in Silver canyon in the White mountains opposite Laws, Inyo county, at an elevation of over 5000 feet, growing in gravel near a small stream. Not common. The type came from "valleys and foot-hills of Western Nevada," according to Watson, l. c. 247, under var. *strictum*.

WHEELERELLA CIRCUMSCISSA (H. & A.) Grant, Bull. So. Cal. Acad. **5**: 28. 1906.

Lithospermum? circumscissum H. & A. Bot. Beech. 370. 1840.

Piptocalyx circumscissus Torr. U. S. Expl. Exped. **17**: 414. *pl. 12. B.* 1874.

Eritrichium circumscissum Gray, Proc. Am. Acad. **10**: 58. 1874.

Krynitzkia circumscissa Gray, Proc. Am. Acad. **20**: 275. 1885.

No. 8235, collected May 11, along the base of the White mountains opposite Laws, Inyo county. Common in that part of Owen's valley. Determined by Professor Greene.

PLAGIOBOTHRYS ARIZONICUS (Gray) Greene, in Gray, Proc. Am. Acad. **20**: 284. 1885.

Eritrichium canescens var. *Arizonicum* Gray, Proc. Am. Acad. **17**: 227. 1882.

No. 8282, collected May 18, in the Sierra foothills west of Bishop, Inyo county, in coarse granite sand. Not common. The type was collected in "Arizona." Determined by Professor Greene.

OREOCARYA LUTEA Greene, ined.

No. 8211, collected May 9, on rocky slopes in Silver canyon in the White mountains opposite Laws, Inyo county. Plentiful on steep slopes about three miles up the canyon. A handsome species with bright golden yellow flowers, in appearance much like a *Lithospermum*.

CRYPTANTHE BARBIGERA (Gray) Greene

No. 8270, collected May 16, in Silver canyon opposite Laws, Inyo county, growing on the floor of the canyon and very abundant. Determined by Professor Greene.

CRYPTANTHE PECTOCARYA (Torr.) Greene

No. 8205, collected May 8, on the edge of the sand hills west of Laws, Inyo county. Determined by Professor Greene.

CRYPTANTHE RACEMOSA (Wats.) Greene, Pittonia, **1**: 115. 1887.

Eretrichium racemosum Wats. in Gray, Proc. Am. Acad. **17**: 226. 1882.

Krynitzkia racemosa Greene, Bull. Cal. Acad. **1**: 208. 1886.

No. 8209, collected May 9, in Silver canyon in the White mountains opposite Laws, Inyo county, growing on and about rocks. A peculiar looking suffrutescent plant, the type collected in "Mesquite Canyon, San Bernardino Co., California. Determined by Professor Greene.

CRYPTANTHE RECURVATA Coville, Cont. U. S. Nat. Herb. **4**:

165. *pl. 16*. 1893.

No. 8221, collected May 9, in Silver canyon in the White mountains opposite Laws, Inyo county. Plentiful along the roadside and at other places on the floor of the canyon. The type was collected in "Surprise Canyon, Panamint Mountains, Inyo County, California." Determined by Professor Greene.

CRYPTANTHE UTAHENSIS (Gray) Greene, Pittonia, **1**: 120. 1887.

Krynitzkia Utahensis Gray, Syn. Fl. **2**: Part 1. Ed. 2. 427. 1886.

No. 8275, collected May 18, in the foothills west of Bishop, Inyo county, in rich soil along Birch creek, where it was plentiful. The type was collected at "St. George, S. W. Utah." Determined by Professor Greene.

No. 8365, collected June 5, in a ravine among the hills near Mina, Esmeralda county, Nevada. Not plentiful there. Determined by Professor Greene.

Cryptanthe arenicola

Annual, 3 dm. high, rather lax, branched from near the base, the branches ascending, scabrous with appressed sharp hairs intermixed with a few spreading ones above; pustules at base inconspicuous: leaves oblong, 2.5 cm. or less long, 3 mm. wide, sessile, a little narrowed at base and apex, the lower ones barely sub-acute, the upper acute, pubescence appressed but less so than on the stem, the pustules conspicuous: inflorescence 4 cm. long or less, at length rather lax: flowers white, sub-sessile: calyx 3 mm. long in flower, double that in fruit, the lobes linear, blunt, densely hispid: corollas small and narrow, little exceeding the calyx: nutlets 4, slender and pointed, nearly 2 mm. long, greenish, prominently roughened, scar a narrow groove extending all along the face, very little widened at base.

The type is no. 3203, collected May 8, 1906, on the edge of the sand hills about three miles west of Laws, Inyo county, California. Related to *C. intermedia*, but differing in its narrower flower, much longer calyx, and the muriculations of the nutlets not "usually sharp-pointed." Submitted to Professor Greene, who pronounced it undescribed.

Cryptanthe pumila

Annual, 1-1.5 dm. high, nearly simple or branched throughout, rather thickly clothed with long hispid hairs pustulate at base: leaves linear, 2 cm. or less long, 2 mm. wide, sub-acute: inflorescence 2 or 3 cm. long, at length rather lax, not leafy: flowers white: calyx 3 mm. long, densely white hispid, the lobes narrowly lanceolate, acute: corollas small, about 4 mm. long, narrow: nutlets 4, barely 1 mm. long, pale and smooth.

The type is no. 8403, collected June 12, 1906, near the summit of Mt. Tamalpais, Marin county, California, in a moist open place along the railroad. A relative of *C. leiocarpa* of the sand hills along the coast, but differing in the lack of canescent pubescence and the inflorescence not leafy. It probably resembles *C. hispidissima*, but is a smaller plant with more spreading

branches, has a smaller corolla and smaller calyx, the segments not "long-attenuate." Referred to Professor Greene, who pronounced it undescribed.

AMSINCKIA SPECTABILIS F. & M.

No. 8153, collected April 11, along the San Joaquin river a short distance above Pollasky, Fresno county, on grassy banks. Plentiful and showy.

Amsinckia pustulata

Annual, about 3 dm. high, branched from the base, the branches ascending, hispid with scattered white pointed hairs which have oblong pustules at base, leafy throughout: leaves coriaceous, ovate-lanceolate, the largest lower ones 4 cm. long, 15 mm. wide, the upper reduced but usually broad for their length, rather smooth appearing to the eye, but hispid with sharp white hairs, the pustules at base rounded and raised, very prominent, whitish: inflorescence rather lax, barely 1 dm. long, naked: flowers bright orange-yellow on pedicels nearly 2 mm. long: calyx 5 mm. long in flower, 8 to 10 mm. long in fruit, the lobes lanceolate, acute, hispid like the leaves but with short vilous hairs intermingled, only slightly tawny: corollas small and narrow, exserted about 3 mm. from the calyx: nutlets ovate, short-acuminate, 3 mm. long, nearly 2 mm. wide at base, the back with a raised rib and a slight depression on either side, covered with granulate-warty projections.

The type is no. 8204, collected May 8, 1906, on the edge of the sand hills about three miles west of Laws, Inyo county, California. Related to *A. tessellata*, but differing in its broader acute leaves, and less dense pale pubescence. Apparently mixed with that species from the beginning, but its type is the specimen from near Mt. Diablo, in the coast range.

LAMIACEAE

STACHYS CALIFORNICA Benth.

No. 8401, collected June 12, along the railroad near the summit of Mt. Tamalpais, Marin county, and rather plentiful at different places. While answering in some points to the description of this species, it does not in others. The type was collected somewhere near San Francisco.

No. 8415, collected July 24, in sandy pine woods near the Point Pinos light house, Monterey county, growing in a tangle of other vegetation in moist sheltered places. Our western species of *Stachys* are highly differentiated, and have never been properly studied, and when some one has time to do so, especially in the field, a number of species will be segregated from what we now call *S. californica* and *S. bullata*.

SALVIA COLUMBARIÆ Benth.

No. 8340, collected May 29, on gravelly slopes in Silver canyon opposite Laws, Inyo county. A species widely distributed over the State, most plentiful in the drier parts. It occurs in Santa Clara county in the Coast Range at nearly 3000 feet.

Madronella franciscana Elmer

Monardella franciscana Elmer, Bot. Gaz. 41: 320. 1906.

No. 8371, collected June 8, on the San Bruno hills at Ocean View, San Francisco, where several large clumps were noticed. This does not altogether answer to the description of the original. The stems are less pubescent, the leaves are not fascicled and are only about half the maximum size. The type was collected at "San Pedro, San Mateo County, California." Mr. Elmer has authorized me to make the change of combination for him.

MADRONELLA UNDULATA (Benth.) Greene, Leaflets, 1: 168. 1906.

Monardella undulata Benth. Lab. 332. 1833.

No. 8426, collected July 31, along the railroad about two miles northeast of Del Monte, Monterey county, in the sand hills, where it was abundant. A species restricted to the coast region from Point Reyes, Marin county, southward.

SCROPHULARIACEAE

ANTIRRHINUM KINGII Wats. Bot. King Rep. 215. *pl.* 21. *f.* 1-4. 1871.

No. 8341, collected May 29, in Silver canyon in the White mountains opposite Laws, Inyo county, growing on slopes in gravel. Plentiful locally, but not noticed elsewhere. The type was collected in "Washoe Valley," Nevada.

COLLINSIA CALLOSA Parish; Erythea, 7: 96. 1899.

No. 8290, collected May 21, in the first canyon in the Sierra foothills south of Bishop, Inyo county, growing on steep slopes in coarse granite sand. Plentiful there but not seen elsewhere. Since the plant was different in appearance from any in the genus known to me, a description was made from living material, parts of which may supplement Mr. Parish's description.

Calyx campanulate, in flower 5 mm. long, 4 mm. across, the base truncate, tube equaling the lanceolate practically equal lobes: corollas violet purple, about 9 mm. long, the upper lip strongly gibbous 1 mm. above the base, 5 mm. long, broadly cuneate, 4 mm. wide above, 3 mm. wide below, the apex notched for nearly 2 mm., the lobes rounded and obtuse, lower half of the lip whitish, marked on the inside with small purple dots and with two small callosities at the base; lower lip a little narrower, than the upper, the lateral lobes more oblong and slightly turned back toward the keel-like middle lobe, which is 1 mm. shorter, quite narrow, a little over 1 mm. deep: style filiform.

COLLINSIA BICOLOR Benth.

No. 8157, collected April 12, in upland meadows in Madera county near the San Joaquin river about four miles above Polasky. A form with larger flowers than usual, the lower lip a deep rose-purple.

COLLINSIA BARTSIAEFOLIA Benth. DC. Prodr. **10**: 318. 1846.

No. 8157, collected April 12, in Madera county, on grassy slopes near the San Joaquin river about four miles above Polasky, plentiful at one place. These plants are not glandular, merely puberulent with no trace of pubescence except a faint ciliation on the calyx lobes.

Scrophularia floribunda (Greene)

Scrophularia Californica var. *floribunda* Greene, Manual, 273. 1894.

No. 8143, collected April 11, in Madera county in grassy uplands near the San Joaquin river about three miles above Polasky, growing about granite boulders. I have recognized this as distinct for several years, and in 1904 distributed it as a species. The range is given as "hills of the interior," in the San Francisco bay region.

SCROPHULARIA OCCIDENTALIS (Rydb.) Bicknell, Bull. Torr. Club, **23**: 315. 1896.

Scrophularia nodosa occidentalis Rydb. Cont. U. S. Nat. Herb. **3**: 517. 1896.

No. 8222, collected May 10, along the base of the Sierra foothills about three miles south of Bishop, Inyo county, growing about granite boulders. Perhaps not this species, but referred here rather than to either of the named forms from the western part of the State. The type was collected near "Rapid City," South Dakota.

Pentstemon monoensis

Perennial, stems several from a tough woody root, 3 or 4 dm. high or less, glaucous appearing but densely puberulent below the inflorescence, then densely glandular pubescent: leaves coriaceous, rather broadly lanceolate, the lowermost with blade about 6 cm. long, 2 to 3 cm. wide, tapering into a petiole 2 cm. long; the apex sub-acute, the one or two pairs of stem leaves sessile, somewhat shorter and more acute, all appearing smooth

and glaucous, but puberulent like the stem: inflorescence 2 dm. long or less, with several distant whorls of rose-purple flowers, the flowers dense in the whorl, each whorl subtended by a pair of foliaceous, acute, broadly lanceolate, glandular pubescent bracts, the lowermost equaling the flowers, the others successively a little shorter: calyx 8 mm. long, the lobes lanceolate, 5 mm. long, unequal in width, the widest 3 mm., pubescent with short, soft, spreading glandular hairs: corollas about 2 cm. long, the tube pubescent like the calyx, barely 3 mm. across at base, 5 mm. across the top, the inflation gradual, the upper part immediately under the lower lip with a plane space 5 mm. long, 3 mm. wide, marked with two grooves; lobes spreading, the upper lip 8 mm. across, 2-cleft for 2 mm., the divisions quadrate-oblong, very slightly downcurved at apex; lower lip 1 cm. wide, 5 or 6 mm. long, cleft almost to the base, the divisions oblong, rounded and obtuse, the lateral ones nearly 4 mm. wide: anthers split almost to the apex, low V-shaped; sterile filament bearded near the apex on one side with yellow hairs: style slender, the stigmatic tip not enlarged.

The type is no. 8331, collected May 25, 1906, in the extreme southern part of Mono county, California, along the base of the White mountains near the Southern Belle mine. A handsome species, and perhaps not rare in that region.

Pentstemon recurvatus

Perennial, stems several from a short, decumbent, rather slender rootstock about 3 dm. high, glabrous, purplish, leafy: basal leaves spatulate or oblanceolate, sub-acute, 5 cm. or less long, 1 cm. or less wide; tapering into the margined petiole; stem leaves lanceolate, sessile, acute, the lowest 4 or 5 cm. long, 1 cm. wide, the others gradually a little smaller, the base usually rather wide, all glabrous: flowers violet-purple in about three whorls, each whorl subtended by a pair of linear-lanceolate green bracts, the lowermost longer than the flowers, the others shorter: calyx 4 mm. long, 2 mm. across, green except the slightly

hyaline edges of the lobes, which are oblong, 2 mm. long, the acute tips somewhat recurved, a little concave: corollas 1 cm. long, narrowly funnelform, 2 mm. across below, 4 mm. above, the lobes oblong, rounded, spreading, barely 3 mm. long, 2 mm. wide, the upper lip with the lobes somewhat approaching, those of the lower lip spreading, the lower lip twice the width of the upper (7 or 8 mm.); throat scantily bearded at the base of the middle lobe of the lower lip: anthers explanate; sterile filament slightly enlarged and flattened above, bearing a few hairs on one side just below the apex: style a little stouter than the filaments, the stigmatic apex not enlarged.

The type is no. 8360, collected May 31, 1906, in the foothills west of Bishop, Inyo county, California, a short distance above the house in "McGee's meadows," in a moist grassy place. A relative of *P. confertus*, but apparently different from any of the species recently proposed by Professor Greene.

MIMULUS GRANDIS (Greene) Heller, *Muhlenbergia*, **1**: 110. 1904.

Mimulus guttatus var. *grandis* Greene, *Manual*, 277. 1894.

No. 8376, collected June 8, in San Mateo county, along the Southern Pacific tracks near Ocean View, San Francisco, in wet sandy soil. An elegant large species, one of the handsomest in the genus when it is covered with the large yellow flowers. The given range of the type is "stream banks and some boggy places among the hills near the Bay" of San Francisco.

MIMULUS LANGSDORFII Sims

No. 8343, collected May 29, in Silver canyon in the White mountains opposite Laws, Inyo county, growing in wet places along a small stream, the stems stout, terete, hollow. Lacking knowledge of the type, I am again compelled to refer to this species a plant which I feel may perhaps be undescribed.

MIMULUS MICROPHYLLUS Benth. DC. *Prodr.* **10**: 371. 1846.

No. 8323, collected May 23, in the Sierra foothills west of Bishop, Inyo county, in moist places in a shallow ravine, the

identification not positive. It resembles *M. hallii* Greene, from Colorado. The type was collected "in rupibus ad flumen Oregon."

MIMULUS NASUTUS Greene, Bull. Cal. Acad. **1**: 111. 1885.

No. 8158, collected April 12, in Madera county about four miles above Pollasky, growing about large flat granite rocks on the edge of a stream. The plants were large and robust, many of them fully three feet high and much branched. Ordinarily it is of rather low growth. The type came from "Sonoma County, Cal., at Knight's Valley and Skaggs' Springs."

MIMULUS FLORIBUNDUS Dougl.; Lindl. Bot. Reg. **13**: *pl.* 1225. 1827.

No. 8142, collected April 11, in Madera county in moist crevices of granite rocks about three miles above Pollasky. Clammy but hardly "slimy," as described. The plants were weak and delicate, the leaves thin. The type was collected "on moist rocks in the interior of the districts of the Columbia River."

MIMULUS RUBELLUS Gray, Bot. Mex. Bound. 116. 1859.

No. 8210, collected May 9, in Silver canyon in the White mountain opposite Laws, Inyo county, growing in damp places in gravel about rocks. The flowers are pale rose-purple, the tube a very little longer than the calyx. Minutely glandular and clammy, but the leaves not "trinervibus" as in the original. The midvein only is prominent, and besides this there are either two or four indistinct ones. The type was collected in "wet ravines of the Organ mountains and Copper Mines," New Mexico.

No. 8212, collected May 9, in Silver canyon in the White mountains opposite Laws, Inyo county. The flowers are yellow, the tube no longer than the calyx. While this may be different from no. 8210, the red flowered form listed above, I can find no good characters upon which to separate them. Determined by Professor Greene.

EUNANUS CUSICKII Greene, Pittonia, **1**: 36. 1837.

Mimulus cusickii Piper, Cont. U. S. Nat. Herb. **11**: 508.
1906.

No. 8194, collected May 7, in Silver canyon in the White mountains opposite Laws, Inyo county, growing in gravel. The broad rotately spreading corolla lobes make this a distinct appearing species. The type was collected on Malheur river, Oregon. Our station is a remarkable extension of its range southward. Determined by Professor Greene.

EUNANUS FREMONTII Benth. DC. Prodr. **10**: 374. 1846.

Mimulus Fremontii Gray, Proc. Am. Acad. **11**: 96. 1876.

No. 8279, collected May 18, in the foothills west of Bishop, Inyo county, in coarse granite sand. Abundant at one place, but not seen elsewhere. In the Synoptical Flora, page 275, the calyx teeth are said to be "ovate, obtuse or acutish, and in the Supplement the plant is described as "not glandular and little viscid." Our specimens are glandular and viscid, and the calyx teeth broad at the base, tapering to a short-acuminate point.

CASTILLEJA ANGUSTIFOLIA (Nutt.) Don, Gen. Syst. **4**: 616.
1838.

Euchroma angustifolia Nutt. Journ. Acad. Phila. **7**: 46.
1834.

Castilleja desertorum Geyer; Hook. Journ. Bot. Kew Gard.
Misc. **5**: 258. 1853.

No. 8189, collected May 7, in Silver canyon in the White mountains opposite Laws, Inyo county, growing in gravel. A showy plant, abundant at one place, growing in thick clumps as a rule. The type was collected "in dry prairies, on the borders of Little Goddin river, near the sources of the Columbia waters."

CASTILLEJA MONTANA Congdon, Erythea, **7**: 188. 1900.

No. 8254, collected May 14, along an irrigating ditch at the base of the Red Hill west of Bishop, Inyo county. Plentiful there and at other places near Bishop along streams, often

growing in dense colonies. A tall handsome species, whose occurrence in this region was not expected, although I found it on the east side of the Sierras at Donner lake in 1903. The type came from the west side of the Sierras, from the "Wawona and Yosemite region generally.

ADENOSTEGIA RIGIDA Benth.; Lindl. Intr. Nat. Syst. Ed. 2.
445: 1836.

Cordylanthus filifolius Nutt.; DC. Prodr. 10: 597. 1846.

No. 8427, collected July 31, in the sand hills along the railroad about two miles northeast of Del Monte, Monterey county. Abundant, the flowers cream colored instead of "purplish," as described in the Synoptical Flora, although some of them darken in drying. The retuse tips of the upper and floral leaves are not much in evidence, neither is the character of "hispid- or setosé-ciliate bracts and floral leaves" well marked.

ORTHOCARPUS PURPURASCENS Benth.

No. 8381, collected June 8, in San Mateo county, near Ocean View, San Francisco, on the Lake Merced side of the Ocean Shore tracks in sandy soil. This is the form with pale lavender bracts, and whether it is the typical form I do not know. The species as at present received is evidently an aggregate.

Orthocarpus micranthus Greene

Low annual, 15 cm. or less high, either simple or bearing a few ascending branches from near the base, the stems very slender, purplish, nearly glabrous below, pubescent above with short wavy hairs: leaves scattered, 15 mm. long or less, pubescent like the stem, the lower opposite, simple, filiform, the others with several filiform lobes: inflorescence occupying the upper two-thirds or half of the plant, lax: bracts commonly shorter than the flowers, uncolored; the base oblong or obovate, 2 mm. long, the divisions filiform: flowers sub-sessile: pubescence of calyx much more dense than on the stem or leaves; flowering calyx

5 mm. long, the tube 2 mm. long, lobes narrowly lanceolate, short acuminate, in the fruiting stage appearing shorter than the tube by the inflation of the latter: corollas bright yellow, 1 cm. long, the very narrow tube 7 mm. long, barely 1 mm. across, glabrate or somewhat pubescent with short hairs, lower lip about 2 mm. broad and as deep, purple spotted at base, the inner side standing a little away from the galea, woolly; galea lance-linear, slightly curved, purple, 3 mm. long, extending 1 mm. above the lower lip: capsule oblong-ovoid, 4 mm. long, dull pale brown: seeds numerous, their coats cellular.

The type is no. 8169, collected April 12, 1906, in Madera county, California, in an upland meadow near the San Joaquin river about four miles above Pollasky. Professor Greene, to whom specimens were submitted, identified it as his *O. micranthus*, which was never described, and the original type he says was no doubt destroyed in the great fire at San Francisco, since it was in the herbarium of the California Academy of Sciences. This type will also be deposited in the herbarium of the Academy. Whether this species is the same as the plant listed in the Synoptical Flora, Supplement, page 453, as a variety "*micranthus*" of *O. bidwelliae* I do not know, but presumably it is. The supposed "description" there is no better than a *nomen nudum*, for it is impossible to identify this plant with it. Our plant is not "depauperate and few flowered" compared with *O. bidwelliae*, neither is it with "corolla barely half the usual size." The corolla tube is almost as long as that of *O. bidwelliae*, but the lip is only about one-fourth the size.

OROBANCHACEAE

THALESIA FASCICULATA (Nutt.) Britton

No. 8398, collected June 12, along the railroad near the summit of Mt. Tamalpais, Marin county. A few plants were picked up at intervals, but never many at any one place.

PLANTAGINACEAE

PLANTAGO VIRGINICA L. Sp. Pl. 113. 1753.

No. 7896, collected May 30, 1905, on the banks of a stream about three miles northeast of Redding, Shasta county, growing among grass under and near shrubs. Not appearing as if introduced, and somewhat different in appearance from the plant of the east. Determined by Mr. E. L. Morris.

PLANTAGA GALEOTTIANA Dcne. DC. Prodr. 13:

No. 8387, collected June 8, in San Mateo county in wet sand along the Southern Pacific tracks near Ocean View, San Francisco. This is the plant we have been referring to the South American *P. hirtella*. I can find no reference to *P. galeottiana* in the Synoptical Flora, but suppose it was published in the Prodromus. Mr. Morris informed me two years ago that this is the proper name for our plant.

CAPRIFOLIACEAE

SYMPHORICARPOS LONGIFLORUS Gray, Journ. Linn. Soc. 14:
12. 1873.

No. 8285, collected May 18, in the foothills west of Bishop, Inyo county, on steep slopes near rocks. Rather plentiful at one place, the shrubs much branched, three or four feet high. The bark of the old stems is nearly white, falling off in shreds, while the young branches are purplish. In the Synoptical Flora the corolla is said to be white, but in these specimens it is purplish.

LOBELIACEAE

NEMACLADUS RAMOSISSIMUS Nutt. Journ. Acad. Phila. II. 1:
254. 1848.

No. 8278, collected May 18, in the foothills west of Bishop, Inyo county, in coarse granite sand. The flowers are white or creamy. This may perhaps be distinct, but one cannot decide

from the descriptions in the Synoptical Flora, evidently made to cover several forms.

CICHORIACEAE

SCOLYMUS HISPANICUS L.

No. 8416, collected July 27, at Los Gatos, Santa Clara county, where it is sparingly but well established at the end of east Main street. A large plant with coarse spiny leaves and numerous showy yellow flowers. Perhaps the only known station in this country.

ANISOCOMA ACAULIS Gray

No. 8243, collected May 12, on the sand hills about three miles west of Laws, Inyo county, plentiful locally in fine sand. A typical desert plant and a handsome species.

PTILORIA CORONARIA Greene, Pittonia, **2**: 132. 1890.

Stephanomeria coronaria Greene, Bull. Cal. Acad. **1**: 194. 1885.

No. 8424, collected July 31, on the sand hills about two miles northeast of Del Monte, Monterey county, along the railroad. Abundant there and at intervals all along the railroad from Monterey well over toward Castroville in the sand hills. The flowers are large, rose-purple, and remain open until after noon, at least on cloudy days. The type came from the "Santa Lucia Mountains, Calif." It was "also sent from Monterey Co. by Mr. Hickman." Ordinarily one would not look for mountain species upon the sand hills of the coast, but our specimens seem referable here rather than to any other described species.

CALYCOSERIS PARRYI Gray, Bot. Mex. Bound. 106. 1859.

No. 8246, collected May 14, on the Red Hill west of Bishop, Inyo county, in gravel. Rather plentiful there, and noticed in the White mountains opposite Laws. The type came from "mountains east of Monterey, California," a station considerably outside of its ordinary range.

CREPIS INTERMEDIA Gray, Syn. Fl. 1: Part 2. 432. 1878.

No. 8322, collected May 23, on the edge of a small dry peat bog in the Sierra foothills west of Bishop, Inyo county, in granite sand. The pappus is white in these specimens, the immature akenes yellow, a little narrowed above. If the Rocky mountain plant is the type of this species, our plant is possibly distinct.

AMBROSIACEAE

HYMENOCLEA MONOGYRA T. & G. Mem. Am. Acad. II. 4: 79.
1849.

No. 8224, collected May 10, along the base of the Sierra foothills about three miles south of Bishop, Inyo county. A straggly branching shrub four or five feet high, the bark whitish. It is quite different in appearance from *H. salsola*, collected last year near Bakersfield in April, a species which in Bot. Gaz. 37: 271, Professor Aven Nelson says "comes into blossom in August." The type was collected "along the valley of the Gila."

IVA AXILLARIS Pursh, Fl. Am. Sept. 743. 1814.

No. 8334, collected May 25, on the rising plain in the extreme southern part of Mono county, near the Southern Belle mine. These plants are pubescent, the hairs on the stem somewhat tangled, those on the leaves appressed. The involucre are almost entire. The type was collected "in upper Louisiana."

CARDUACEAE

TUMIONELLA MONACTIS (Gray) Greene

No. 8263, collected May 15, on the hills near the county hospital at Big Pine, Inyo county. Very common there as well as among the Sierra foothills near Bishop, in granite sand.

CHRYSOMA FASCICULATA Eastw. Bull. Torr. Club, **32**: 215.
1905.

No. 8425, collected July 31, on the sand hills along the railroad about two miles northeast of Del Monte, Monterey county. This is from type locality, "along the coast near Monterey, California." It is abundant, but was just beginning to bloom, so but few specimens were obtained.

LESSINGIA PECTINATA Greene, Proc. Phila. Acad. **1895**: 548.
1896.

No. 8423, collected July 31, on sand hills along the railroad about two miles northeast of Del Monte, Monterey county. From type locality, and plentiful from a point just outside the grounds at Del Monte well over toward Castroville in the sand hills, at least along the railroad. A low mat-like plant, often over a foot in diameter.

CORETHROGYNE CALIFORNICA DC. Prodr. **5**: 215. 1836.

No. 8414, collected July 24, in sandy pine woods back of Point Pinos light house, Monterey county. The rays are pinkish, but turn darker in drying. The plants are mostly ascending from a decumbent base.

Corethrogyne rigida (Gray)

Corethrogyne filaginifolia var. *rigida* Gray, Syn. Fl. **1**:
Part 2: 170. 1878.

Corethrogyne viscidula Greene, Fl. Fran. 378. 1897.

No. 8422, collected July 31, on the sand hills along the railroad about two miles northeast of Del Monte, Monterey county. A large upright plant, much branched, the large flowers either pink tinged or purplish. From type locality, and rather plentiful. In the Synoptical Flora Gray credits Bentham with the authorship of the name *rigida* as a variety of *C. incana*, in Pl. Hartw. 316. But Bentham used it merely as a descriptive term: "var. ? *rigida*, basi lanata, superne viscoso-pubescent, ramosa polycephala. Flores radii ex Hartw. violacei.—In col-

libus arenosis juxta Monterey." Bentham's description, and the place of collection place this plant beyond a doubt, and as the older name, *rigida* should be substituted for *viscidula*.

CORETHROGYNE FILAGINIFOLIA (H. & A.) Nutt. Trans. Am. Phil. Soc. **7**: 290. 1840.

Aster? filaginifolius H. & A. Bot. Beech. 146. 1833.

No. 8406, collected July 24, in moist grassy places along the beach near Point Pinos light house, Monterey county. A large plant, the procumbent tangled stems nearly two feet long. From type locality, "Monterey, California." Apparently not extending around to the town of Monterey.

XYLORRHIZA TORTIFOLIA (T. & G.) Greene

No. 8311, collected May 22, on the plain between Laws and the White mountains, Inyo county, growing about low desert shrubs. A showy species, with large deep lavender colored flowers, the leaves variable.

Erigeron tephrodes Greene, Leaflets, **1**: 222. 1906.

No. 8315, collected May 23, in the foothills west of Bishop, Inyo county, in moist grassy places near the house in "McGee's meadows." A handsome perennial, several stems from each root, the flowers bluish.

ACAMPTOPAPPUS SHOCKLEYI Gray, Proc. Am. Acad. **17**: 208. 1882.

No. 8368, collected June 5, near Mina, Candelaria county, Nevada. Rather plentiful, both in gravel here and there on the plain, or in ravines among the hills. The type was collected in the same county at Candelaria, some distance south of Mina.

GNAPHALIUM BICOLOR Bioletti, Erythea, **1**: 16. 1893.

No. 8137, collected April 11, in Madera county among granite boulders about three miles above Pollasky. The type came from San Diego. The species is widely distributed, being plentiful on the sand hills along the railroad between Del Monte

and Castroville, Monterey county, and now its range is extended to the Sierra foothills.

BLEPHARIPAPPUS GLANDULOSUS Hook. Fl. Bor. Am. **1**: 316.
1833.

Layia glandulosa H. & A. Bot. Beech. 148. 1840.

No. 8242, collected May 12, in the sand hills about three miles west of Laws, Inyo county. Not uncommon in that region. The stem and leaves bear scattered long stalked glands. The type was collected "on the plains of the Columbia in sandy soils."

JAUMEA CARNOSA (Less.) Gray, in Torr. U. S. Expl. Exped. **17**: 360. 1874.

Coinogyne carnosa Less. Linnaea, **6**: 521. 1831.

No. 8409, collected July 24, in moist grassy places on the borders of a pond near Point Pinos light house, Monterey county. Determined by Professor Greene. In the Synoptical Flora Gray says "leaves spatulate-linear, almost terete." They may be "almost terete" when poorly pressed, but when fresh as well as well pressed, are plane, 5 mm. wide or less. This false leaf character appears in both Flora Franciscana and Jepson's Flora. Perhaps Lessing's name *Coinogyne* should be retained for our plant, since it differs somewhat from typical *Jaumea*.

EATONELLA NIVEA (D. C. Eaton) Gray, Proc. Am. Acad. **19**:
19. 1883.

Burrielia nivea D. C. Eaton, Bot. King Rep. 174. *pl.* 18. *f.*
6-14. 1871.

Actinolepis nivea Gray, Bot. Cal. **1**: 379. 1876.

No. 8362, collected May 31, in the foothills west of Bishop, Inyo county, growing on granite sand. An inconspicuous but striking little plant, densely white woolly, the small flowers almost concealed. The type was collected on the "foot-hills of Western Nevada, from the Virginia to the Pah Ute Mountains."

BAERIA DEBILIS Greene

No. 8138, collected April 11, in Madera county on grassy hillsides about three miles above Pollasky, growing about granite rocks, especially under shelving places facing north.

No. 8165, collected April 12, in Madera county, about five miles above Pollasky on a high ridge overlooking the San Joaquin river. These plants were growing in dense colonies under and about shrubs, and are taller and stouter than usual.

MONOLOPIA MINOR DC. Prodr. **6**: 74. 1837.

No. 8160, collected April 12, in Madera county, on a high ridge overlooking the San Joaquin river about five miles above Pollasky, growing in gravel near pine trees and rocks. Very abundant at one place. It seems remarkable that this long lost species should be found in the Sierra foothills and not in the Coast Range where Douglas got it many years ago. Determined by Professor Greene.

ERIOPHYLLUM ARACHNOIDEUM (F. & L.) Greene, Manual, 207. 1894.

Bahia arachnoidea F. & L. Ind. Sem. Hort. Petrop. **9**: 63. 1843.

No. 8400, collected June 12, near the summit of Mt. Tamalpais, Marin county. This is a species of the coast region, where it grows on moist banks among a profusion of other vegetation, and its occurrence on a mountain top is unusual. Determined by Professor Greene. The type from "semina missa sunt e Novae Californiae colonia Ross," now Fort Ross, Sonoma county.

ACTINOLEPIS MULTICAULIS DC. Prodr. **5**: 655. 1836.

Eriophyllum multicaule Gray, Proc. Am. Acad. **19**: 24. 1883

No. 8241, collected May 12, in the sand hills about three miles west of Laws, Inyo county. The plants are small with rather stout short stems. Plentiful in the vicinity, but not uniformly so. Determined by Professor Greene.

ACTINOLEPIS WALLACEI Gray, Proc. Am. Acad. **9**: 198. 1874.

Bahia Wallacei Gray, Pac. R. Rep. **4**: 105. 1857.

Eriophyllum Wallacei Gray, Proc. Am. Acad. **19**: 25.
1883.

No. 8240, collected May 12, on the sand hills about three miles west of Laws, Inyo county, with *A. multicaulis*, which it does not resemble so much as it does *Syntrichopappus fremontii*. The type was collected at "Teyunga; near Los Angeles, California." Determined by Professor Greene.

CHAENACTIS FREMONTI Gray

No. 8237, collected May 11, along the base of the White mountains opposite Laws, Inyo county. Abundant all through that section, both on the slate and shale of the eastern side and on the granite sands of the west side.

CHAENACTIS STEVIOIDES H. & A.

No. 8244, collected May 12, on the sand hills about three miles west of Laws, Inyo county. Often growing with *C. Fremonti*, but not so common. Easily recognized by its greater size and larger flowers.

CHAENACTIS MACRANTHA Wats. Bot. King Rep. 171. *pl. 28. f.*
1-5. 1871.

No. 8334, collected May 25, in the extreme southern part of Mono county in gravel on the rising plain not far from the Southern Belle mine. Also noticed in Silver canyon about four miles further south, but not common. The type was collected on "foothills of Western Nevada, 5,000-5,500 feet elevation."

ARNICA DISCOIDEA Benth.

No. 8392, collected June 12, near the summit of Mt. Tamalpais, Marin county, in rich soil in open places, less protected than usual.

TETRADYMIA SPINOSA H. & A. Bot. Beech. 360. 1840.

Lagothamnus microphyllus Nutt. Trans. Am. Phil. Soc. II.

7: 416. 1841.

No. 8192, collected May 7, on steep slopes in Silver canyon opposite Laws, Inyo county. Also plentiful all through Owen's valley. A handsome shrub with long needle-like spines, the flowers with a strong honey odor. The type was collected in the "Snake Country," Idaho.

TETRADYMIA GLABRATA Gray, Pac. R. R. Rep. 2: 122. 1855.

No. 8332, collected May 25, on the east side of Owen's valley in the extreme southern part of Mono county, near the Southern Belle mine. Not plentiful there, but reported as abundant in other parts of the valley. The type came from "in the Sierra Nevada."

Senecio monoensis Greene, Leaflets, 1: 221. 1906.

No. 8330, collected May 25, in the extreme southern part of Mono county, on slate hills in the White mountains near the Southern Belle mine. Abundant there as well as in Silver canyon about four miles further south. This is one of the species which does not look like *Senecio*. I had no thought that it belonged to the genus.

CARDUUS OCCIDENTALIS Nutt. Trans. Am. Phil. Soc. II. 7: 418.
1841.

Cnicus occidentalis Gray, Proc. Am. Acad. 10: 45. 1874.

Cirsium occidentale Jepson, Fl. West. Mid. Cal. 509. 1901.

No. 8379, collected June 8, in San Mateo county near Ocean View, San Francisco, on the Lake Merced side of the Ocean Shore tracks in sandy soil. A species limited to the immediate vicinity of the coast from San Francisco southward.

APPENDIX

The grasses and sedges as well as a few other species were not determined when the first part of this report went to press. The grasses and Junci were determined by Professor C. V. Piper, the *Carex* by Mr. Theodor Holm.

JUNCAGINACEAE

TRIGLOCHIN STRIATA R. & P. Fl. Per. **3**: 72. 1802.

No. 8410, collected July 24, in wet sand near Point Pinos light house. Not plentiful. Determined by Miss Eastwood, who has also collected it near Monterey and at Fort Bragg, Mendocino county.

POACEAE

HILARIA JAMESII (Torr.) Benth. Journ. Linn. Soc. **19**: 62. 1881.

Pleuraphis Jamesii Torr. Ann. Lyc. N. Y. **1**: 148. *pl.* 10. 1824.

No. 8369, collected June 5, in gravel near Mina, Esmeralda county, Nevada, growing in small scattered tufts in and on the sides of shallow gullies.

STIPA SPECIOSA Trin. & Rupr. Sp. Gram. Stip. 54. 1842.

No. 8260, collected May 15, on hills near the county hospital at Big Pine, Inyo county, growing in tufts about boulders and shrubs.

✓ ERIOCOMA CUSPIDATA Nutt. Gen. **1**: 40. 1818.

Stipa membranacea Pursh, Fl. Am. Sept. **2**: 728. 1814; not L. 1753.

Oryzopsis cuspidata Benth. in Vasey, U. S. Dep. Agr. Spec. Rep. 63: 23. 1883.

Oryzopsis membranacea Vasey, U. S. Dep. Agr. Div. Bot. Bull. 12: Part 2. *pl.* 10. 1891.

No. 8201, collected May 8, in the sand hills about three miles west of Laws, Inyo county. A widely distributed grass,

the type of which came from "on the banks of the Missouri." *Eriocoma* H. B. K. Nov. Gen. et Sp. 4: 267. 1820, is recognized as a valid genus, and should probably take the name *Montanoa* Cerv. 1825.

AGROSTIS STOLONIFERA L.

No. 8342, collected May 29, in Silver canyon opposite Laws, Inyo county, in wet places along a small stream; rather plentiful.

CALAMAGROSTIS PURPURASCENS R. Br. in Rich. App. Frankl. Jour. 731. 1823.

No. 8396, collected June 12, along the railroad near the summit of Mt. Tamalpais, Marin county. A tall grass growing in dense clumps. The type came from British America between Point Lake and the Arctic Sea.

MELICA BELLA Piper, U. S. Dep. Agr. Div. Agrost. Circ. 27: 10. 1900.

No. 8301, collected May 21, in the first canyon south of Bishop, Inyo county, in the Sierra foothills, growing in coarse granite sand on precipitous slopes. The type was collected in a "rocky ravine, Upper Platte."

MELICA CALIFORNICA Scribn.

No. 7799, collected May 1, 1905, at Keene station in the Tehachapi mountains, Kern county, on grassy banks.

MELICA TORREYANA Scribn. Proc. Acad. Phila. 1885: 47. 1885.

No. 8397, collected June 12, along the railroad near the summit of Mt. Tamalpais, Marin county. A low grass growing in thick tufts.

POA BUCKLEYANA Nash, Bull. Torr. Club, 22: 465. 1895.

Poa tenuifolia Buckley, Proc. Phila. Acad. 1862: 96. 1862; not A. Rich. 1851.

No. 8267, collected May 16, in Silver canyon in the White mountains east of Laws, Inyo county, in gravel on the banks of a small stream growing in tufts, and not plentiful.

POA NEVADENSIS Vasey, Bull. Torr. Club, **11**:6 6. 1883.

No. 8354, collected May 30, near Bishop, Inyo county, in wet ground along the roadside. A tall grass, not uncommon, but hard to dig out of the stiff wet soil. The type was collected in Arizona.

POA SANDBERGII Vasey, Cont. U. S. Nat. Herb. **1**: 276. 1893.

No. 8188, collected May 7, on steep slopes in Silver canyon in the White mountains opposite Laws, Inyo county. Plentiful, growing in thick tufts. The type was collected on rocky basalt hillsides on the Clearwater river near the upper ferry, six miles above Lewiston, Idaho.

No. 8303, collected May 21, in the first canyon in the Sierras south of Bishop, Inyo county, growing plentifully in coarse granite sand along the stream bank.

No. 8304, collected May 21, in the first canyon in the Sierras south of Bishop, Inyo county, growing under an overhanging ledge of granite rock, the plants more slender than those of no. 8303.

FESTUCA ERIOLEPIS Desv. in Gay, Fl. Chil. **6**: 428. 1853.

Festuca arida Elmer, Bot. Gaz. **36**: 52. 1903.

No. 8196, collected May 7, in Silver canyon in the White mountains opposite Laws, Inyo county, in gravel near a small stream. Rather plentiful, the plants growing in small tufts. The type came from Chili.

FESTUCA MEGALEURA Nutt. Journ. Phila. Acad. II. **1**: 188-1847.

Vulpina myuros hirsuta Hack. Cat. Gram. Port. 24. 1888.

Festuca myuros hirsuta Asch. & Graebn. Syn. Mitteleur. Fl. **2**: 558. 1901.

No 8300, collected May 21, at the mouth of the first canyon south of Bishop, Inyo county, in sand under willows. Not plentiful. The type was collected at "Santa Barbara, Upper California."

BROMUS UNIOLOIDES (Willd.) H. B.K. Nov. Gen. et Sp. **1**: 151.
1815.

Festuca unioloides Willd. Hort. Berol. **1**: 3. *pl.* 3. 1806.

No. 8251, collected May 14, at the base of the Red Hill west of Bishop, Inyo county, in sand. A large grass, decumbent at base.

BROMUS TRINII Desv. in Gay, Fl. Chil. **6**: 441. 1853.

Trisetum hirtum Trin. Linnaea, **10**: 300. 1835

Trisetum barbatum Steud. Syn. Pl. Gram. 229. 1854.

Bromus barbatoides Beal, Grasses N. A. **2**: 614. 1896.

No. 8302, collected May 21, in the first canyon in the Sierras south of Bishop, Inyo county, growing under a ledge of overhanging granite rock:

SITANION BREVIARISTATUM J. G. Smith, U. S. Dep. Agr. Div.
Agrost. Bull. 18: 12. 1899.

No. 8329, collected May 25, in the extreme southern part of Mono county, along the base of the White mountains near the Southern Belle mine, growing in clumps in gravel. The type was collected in "Willow Creek Canyon, Panamint Mountains," Inyo county.

CYPERACEAE

CAREX NEBRASCENSIS Dewey

No. 8352, collected in wet places along the roadside near Bishop, Inyo county. Rather plentiful. Determined by Theodor Holm.

JUNCACEAE

JUNCUS EFFUSUS HESPERIUS Piper, Cont. U. S. Nat. Herb. **11**:
180. 1906.

Juncus effusus var. *brunnescens* Engelm. Trans. St. Louis
Acad. **2**: 491. 1868; not *J. tenageja* var. *brunnescens*:
Neilreich, 1859.

No. 8386, collected June 8, in San Mateo county near
Ocean View, San Francisco, in wet sandy places along the
Southern Pacific tracks. The type came from "salt marshes
near San Francisco," according to Engelmann, but Piper says
"Cerro Leon, Mexico."

BRASSICACEAE

CAULANTHUS COULTERI Wats.

No. 8135, collected April 11, in Madera county on gravelly
slopes near the San Joaquin river about three miles above Pol-
lasky. This is perhaps undescribed.

POLEMONIACEAE

GILIA OCHROLEUCA Jones, Cont. West. Bot. **8**: 35. 1898.

No. 8249, collected May 14, on the Red Hill west of Bish-
op, Inyo county, in gravel. The identification is doubtful since
our plant differs in several particulars. A specimen has been
sent to Mr. Jones for comparison.

Gilia cana (Jones)

Gilia latiflora var. *cana* Jones, Cont. West. Bot. **8**: 35.
1898.

No. 8309, collected May 22, between Laws, Inyo county,
and the base of the White mountains. Not uncommon in sand
and gravel, the plants scattered. A specimen has been sent to
Mr. Jones for comparison, but he does not have time at present
to look into the matter: The leaves are "permanently white
woolly," but not "densely" so. The character "flowers longer

and paler" than in *C. latiflora* is very indefinite, for we have nothing in literature which indicates the size of the flowers in the type of that species. It was practically a *nomen nudum* until the Synoptical Flora was issued, and the description there does not mend matters much, for it is made to include several forms, distinct enough in the field, and never growing near each other so far as I have observed. Jones' plant is evidently distinct, even if it is not the same as ours, which may be characterized as follows:

Annual, varying in height from 1 to 2 dm., branched from the base, the spread often equaling the height, somewhat woolly below, and sometimes more or less glandular: leaves thin, mostly basal, oblong, 4 cm. long or less, maximum width about 1 cm., pinnatifid or variously sharply cut and lobed, the divisions acute and spinescent, woolly but the green color not obscured, or some plants nearly smooth; upper leaves when present small and bract like, or some on the middle part of the stem with one or two short lobes: pedicels slender, almost filiform, 2 cm. long or less, glandular above: calyx narrowly campanulate, 3 mm. long, 2 mm. wide, glandular, green except the narrow scarious intercostal spaces, the short, lanceolate lobes awn pointed: corollas about 15 mm. long, 10 or 12 mm. wide when fully expanded, the slender tube proper 1 mm. across, 6 to 8 mm. long, purple, the funnelform throat yellow at base, dark violet-purple above, merging into the pale violet-purple of the lobes, which are broadly ovate, 5 mm. long and about as wide, the rounded apex tipped with a short broad point: stamens a little exserted from the throat, the anthers purplish or bluish: styles commonly almost as long as the corollas, the slender linear stigmas 2 or 3 mm. long, downcurved.

This is distinct from any of the various forms of *G. latiflora* known to me, and if it should prove different from the type of *G. cana*, a name will be supplied later.

CICHORIACEAE

MALACOTHRIX GLABRATA Gray, Syn. Fl. **1**: Part 2, 422. 1878.

Malacothrix Californica var. *glabrata* Gray, in D. C. Eaton,
Bot. King Rep. 201. 1871.

No. 8208, collected May 8, on the sand hills about three miles west of Laws, Inyo county. Plentiful. Determined by Professor Greene. The type was collected at "Carson City," Nevada. In the Synoptical Flora Gray credits the original use of this name to Eaton, but in the King Report it is printed "Var. GLABRATA, Gray, Ms."

MUHLENBERGIA

A. A. HELLER, Editor

LOS GATOS, CALIFORNIA, DECEMBER 30, 1907

BOTANICAL EXPLORATION IN CALIFORNIA

SEASON OF 1907. I—THE COAST REGION

Whenever opportunity offered during April, May and early June, trips were made to points near home which had not heretofore been visited by me, or if so, not at that particular time of the year. The expectation was that little of interest would be obtained in a region supposedly well known botanically, but the opposite proved to be the case, as a number of apparently undescribed forms were obtained, and some interesting facts concerning distribution noted.

The places visited, with the exception of Pacific Grove, are all within the limits of Jepson's "Flora of Western Middle California," and all south of San Francisco. A number of species not reported by Jepson from south of San Francisco, as well as several not in his book were obtained, mention of which is made in the proper place in the notes.

In 1904 about 300 species were collected in the Santa Cruz mountains in Santa Clara county about Los Gatos, chiefly in the foothills west of the town. This season the work was directed to the exploring of the middle Coast Range back of San Jose, separated from the Santa Cruz mountains by the Santa Clara valley, the width of the valley about fifteen miles. The hills back of Alum Rock Park were visited on April 27th.

On May 10th a trip was made to Smith creek, elevation 2100 feet, at the foot of Mt. Hamilton, and again on May 30th, at which time Mt. Hamilton was ascended. Interesting collections were made at this place, one object being to note the similarity or dissimilarity between the plants of the middle and outer Coast Ranges. This point will be dwelt upon later.

Four trips were made into San Mateo county immediately north of Santa Clara county, two of them to the extreme northern end of the county to the San Bruno hills just outside of San Francisco, and to the low sandy hills near by about Lake Merced. Two trips were made to points near San Mateo on the Half Moon Bay road. This latter territory is one of the best botanical grounds in the peninsula, as it abounds in moist places and numerous springs and lakes, chief among which are the Crystal Springs lakes. Several local species have been collected here, and when once the place is thoroughly explored others will no doubt be found. A number of species apparently have their southern limit here.

Pacific Grove, Monterey county, was visited on May 1st in company with Professor P. B. Kennedy, of the University of Nevada, the chief object being a study of the several clovers peculiar to that place, but several species of other genera not collected there in 1903 were obtained.

Full citations are omitted in the case of species hitherto reported upon in these pages during the past two years.

My thanks are due to the members of the department of botany of the University of California for courtesies extended while determining and verifying the plants in this collection.

The nomenclature of this paper is that of the "American code," the official pronouncement of the majority of American botanists, voiced through the Botanical Club of the American Association for the Advancement of Science. To any one familiar with the shortcomings of the so-called international congress at Vienna, adherence to a better set of rules needs no apology.

SELAGINELLACEAE Underw. Our Native Ferns 103.
1881.

SELAGINELLA BIGELOVII Underw.

No. 8604, collected May 31, on the summit of Mt. Hamilton, Santa Clara county, a short distance beyond the observatory, elevation 4200 feet. It was growing on a slope facing the east under shrubs, the place more sheltered than usual, but the plants smaller and shorter than those found back of Alum Rock Park near San Jose in the same mountain range at an elevation of about 800 feet.

TAXACEAE Lindl. Nat. Syst. Ed. 2, 316. 1836.

TUMION CALIFORNICUM (Torr.) Greene, Pittonia, 2: 195. 1891.

Torreya Californica Torr. N. Y. Journ. Pharm. 3: 49. 1853.

Torreya myristica Hook. Bot. Mag. pl. 4780. 1854.

Caryotaxis myristica Henk. & Hochst. Nadehoelz. 368.
1865.

Faetataxus myristica Nelson, Pinac. 168. 1866.

No. 8634, collected June 4, at an elevation of nearly 3000 feet on the ridge above the Alma soda spring, Santa Clara county. Here as well as in the mountains back of Saratoga it is little more than a shrub, being only ten or fifteen feet high. In the middle Coast Range on the slopes of Mt. Sanhedrin in Lake county, I have seen it as a good sized tree, about fifty feet high, at an elevation of at least 4000 feet. Jepson does not record it from this region in his flora, Marin county fifty miles further north being his most southerly station. It occurs in the Sierra Nevada, and apparently is found as far north as Idaho.

POACEAE R. Br. Flind. Voy. App. 2, 583. 1814.

BROMUS PUMPELLIANUS Scribn.

No. 8566, collected May 23, about two miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, growing on an open bank. The plants have rather smaller spikelets than usual. The species is also rather plentiful on the hills about Los Gatos, but is not given in Jepson's Flora.

FESTUCA SUBULIFLORA Scribn. in Macoun, Cat. Can. Pl. **5**: 396.
1890.

Festuca ambigua Vasey, Cont. U. S. Nat. Herb. **1**: 277.
1893. Not Le Gall, Fl. Morbihau. 731. 1852.

Festuca denticulata Beal, Grasses N. A. **2**: 589. 1896.

No. 8548, collected May 18, on the banks of Stevens creek near Soda Rock, Santa Clara county, growing on a bank along the roadside near shrubs, the plants in scattered tufts, not plentiful. This is apparently the plant mentioned in Jepson's Flora under the name *F. denticulata* Beal. The type was collected at Goldstream, Vancouver island. The type of *F. ambigua* Vasey was collected at "Santa Cruz, in 1888, by C. L. Anderson."

MELICA IMPERFECTA Trin.

No. 8551, collected May 18, on the banks of Stevens creek not far from Soda Rock, Santa Clara county, elevation about 800 feet, growing plentifully in thick clumps in shade on the steep banks of the creek.

PHALARIS AMETHYSTINA Trin. Phalar. 56. 1839.

No. 8568, collected May 24, in the hills west of Los Gatos, growing in a shallow ravine near shrubs, elevation 750 feet, on a slope facing eastward. The species is abundant at this one place, but was not noticed elsewhere. It is said to range from southern Oregon to Chili.

PHALARIS LEMMONI Vasey, Cont. U. S. Nat. Herb. **3**: 42. 1892.

No. 355, collected May 22, by R. L. Pendleton, at Saratoga, Santa Clara county, elevation 500 feet, growing in wet places. This is only about half as large as *P. amethystina*, but has a much longer more slender spike. The type was collected at "Santa Cruz, California."

CYPERACEAE J. St. Hil. Expos. Fam. **1**: 62. 1805.

CAREX BIFIDA Boott

No. 8570, collected May 24, on the hills west of Los Gatos,

Santa Clara county, in wet clay along a road, elevation about 600 feet. Mr. Kenneth K. Mackenzie, to whom this was sent for determination, writes as follows: "In the Botany of California this is placed in a section, the distinguishing characteristic of which is that the terminal portion of the uppermost spike is pistillate, while the lower portion is staminate. As a matter of fact the terminal spike is often entirely staminate or has but few perigonia developed. This has resulted in confusion, the species having in at least one instance been distributed as *Carex Lemmoni* W. Boott. In addition to your specimen, I have seen specimens from Crystal Springs Lake, San Mateo county; Loma Prieta peak, Santa Clara county; Los Guilucos valley, Sonoma county; Tamalpais; and Tiburon."

JUNCACEAE Dumort. Comm. Bot. 66. 1822.

JUNCOIDES COMOSUM (E. Meyer) Sheldon, Minn. Bot. Stud. **1**: 64. 1894.

Luzula comosa E. Meyer, Syn. Luz. n. 18. 1823.

Luzula capellaris Steud. Syn. Pl. Glum. **2**: 293. 1855.

No. 8435, collected April 13, on the summit of the Santa Cruz mountains, Santa Cruz county, at Deer Ridge Farm, growing abundantly on a bank near shrubs, the exposure northern, elevation about 3000 feet.

JUNCUS OCCIDENTALIS (Coville) Wiegand, Bull. Torr. Club, **27**: 521. 1900.

Juncus tenuis occidentalis Coville, Proc. Biol. Soc. Wash. **10**: 129. 1896.

No. 8511, collected May 7, along the Interurban tracks near the crossing of Los Gatos creek not far from Campbell, Santa Clara county, growing in moist ground, elevation about 380 feet. Locally plentiful, the plants in large tufts. The type was collected at San Francisco by Bolander. It is not uncommon in the Bay region.

ALLIACEAE Batsch, Gæn. Pl. Jenens. 10, 30. 1786.**ALLIUM DICHLAMYDEUM** Greene

No. 8564, collected May 23, about two miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, growing on a steep bank near and among trees in rich loose soil, the slope facing the west. This is probably the southern limit of the species, and it is more sheltered here than at its native habitat on the open hills about San Francisco.

ALLIUM BREWERI Wats. Proc. Am. Acad. **14**: 233. 1879.

No. 8618, collected May 31, near the summit of Mt. Hamilton, Santa Clara county, at an elevation of 4000 feet; where it is plentiful on a northerly slope, growing on and about loose shingly rocks. The type was collected by Brewer on the summit of Mt. Diablo, and the plant has apparently not been reported from elsewhere until now.

ALLIUM LACUNOSUM Wats. Proc. Am. Acad. **14**: 231. 1879.

No. 8699, collected May 31, on the slopes of Mt. Hamilton, Santa Clara county, above Smith Creek, in open grassy places near oak trees. It was found sparingly at this place, but occurs along the Mt. Hamilton road near Hall's valley. The type was collected in "Santa Clara County, on Mariposa Peak." The elevation at our station is about 2700 feet.

DICHELOSTEMMA CAPITATUM (Benth.) Wood

No. 8569, collected May 24, on the hills west of Los Gatos, Santa Clara county, elevation about 800 feet. It is common in our own and neighboring orchards, usually about two feet high, and as a rule growing in colonies. I have never seen it showing a tendency to twine or lean upon other plants for support. The appendages of the anthers in this species are white, lanceolate, entire.

DICHELOSTEMMA CONGESTUM (Smith) Kunth, Enum. **4**: 470.

1843.

Brodiaea congesta Smith, Trans. Linn. Soc. **10**: 3. *pl.* 1.

1811.

No. 8587, collected May 30, at Smith Creek at the foot of Mt. Hamilton, Santa Clara county, elevation 2100 feet, growing in grassy places about thickets in rather rich soil, the exposure northerly. Also found the following day on the western slope of Mt. Hamilton, elevation about 2800 feet. It was also noticed here and there about Los Gatos and on Stevens creek, but only a few plants at any one place. On Mt. Hamilton it grew in colonies. It blooms later than *D. capitatum*, that species commonly being almost past flowering when this begins, and is also easily distinguished by the more elongated and racemose heads, the long outcurved staminodia colored like the flower, deeply bifid.

TRITELEIA LAXA Benth.

No. 8468, collected April 27, on open grassy slopes in the hills back of Alum Rock Park, Santa Clara county, elevation about 800 feet. This is the typical form, with rather large violet blue flowers. It grew in colonies in stiff black soil.

CALOCHORTACEAE Rydb. Bull. Colo. Ag. Exper. Sta.

100: 85. 1905.

CALOCHORTUS ALBUS Dougl.; Benth. Trans. Hort. Soc. II. **1**:

413. *pl.* 14. *f.* 3. 1835.

No. 8476, collected April 27, back of Alum Rock Park, Santa Clara county, on steep gravelly slopes among a scattered growth of trees and shrubs, the exposure eastern. The flowers are purplish tinged, as seems to be the case in all specimens from the Coast Range. Douglas no doubt collected the type near Monterey, as it is common there in grassy pine woods.

CALOCHORTUS LUTEUS Dougl.; Lindl. Bot. Reg. **19**: *pl.* 1567. 1833.

No. 8630, collected May 31, on the slopes of Mt. Hamilton above Smith Creek, Santa Clara county, at an elevation of about 3000 feet, in open grassy places having a westerly exposure. The plants here were smaller with smaller flowers than the typical form, which is common about Los Gatos, but otherwise appear to be similar. "It was discovered by Mr. Douglas in California; and a few roots of it were received from him by the Horticultural Society in 1831."

CALOCHORTUS VENUSTUS Dougl.; Benth. Trans. Hort. Soc. II. **1**: 412. *pl.* 15. *f.* 3. 1835.

No. 8601, collected May 30, on the Mt. Hamilton road near Grand View, Santa Clara county, elevation about 1500 feet, growing in a field among grass, the exposure southerly. This elegant species was plentiful here, but little of it was seen elsewhere.

TRILLIACEAE Lindl. Nat. Syst. Ed. 2, 347. 1836.

TRILLIUM OVATUM Pursh, Fl. Am. Sept. **1**: 245. 1814.

No. 8334, collected April 13, in the mountains back of Saratoga, Santa Clara county, at an elevation of about 2500 feet, growing sparingly in rich damp soil under redwood trees. Its southern limit is said to be Santa Cruz, from which point it extends northward near the coast. Lewis collected the type "on the rapids of the Columbia river."

IXIACEAE Ecklon, Verzeichn 18. 1827.

(*Iridaceae* Lindl. Nat. Syst. Ed. 2, 332. 1836.)

IRIS CALIFORNICA Leicht.

No 8535a, collected May 10, at Smith Creek at the foot of Mt. Hamilton, Santa Clara county, elevation 2100 feet, growing on a grassy slope near oak trees, locally abundant. The flowers were bright violet-blue, much shorter than the pale green leaves. The hill on which it grew has an easterly exposure.

IRIS WATSONIANA Purdy, *Erythea* **5**: 128. 1897.

No. 8461, collected on the western end of the San Bruno hills, San Mateo county, elevation about 700 feet, growing on northerly slopes in moist places among low shrubs and other vegetation. This species is easily recognized in the field by its deep violet-purple flowers and deep green glossy leaves. I have collected it in boggy places in open pasture land at Bodega Bay, Sonoma county, and at Pacific Grove, Monterey county, where it grows in wet places in the pine woods. Jepson has omitted this species from his Flora. The type came from Eureka, Humboldt county, where it is said to be plentiful.

ORCHIDACEAE Lindl. Nat. Syst. Ed. 2, 336. 1836.

PIPERIA COOPERI (Wats.) Rydb. Bull. Torr. Club, **28**: 636. 1901.

Habenaria Cooperi Wats. Proc. Am. Acad. **12**: 276. 1876.

No. 8513, collected May 18, along Stevens creek near Soda Rock, Santa Clara county, growing on northerly slopes in damp clayey soil, the tubers lightly imbedded in moss or a thin covering of humus. Only a few plants may be found at any given place, but what is apparently the same thing has been noted in similar situations near Los Gatos. The type was collected "on clay hills near San Diego, California," and so far the plant has been known only from that vicinity.

SALICACEAE Lindl. Nat. Syst. Ed. 2, 186. 1836.

SALIX LAEVIGATA Bebb

No. 8432, collected April 6, on the banks of Guadalupe creek near the Guadalupe mine, Santa Clara county, occurring as a shrub six to ten feet high, growing in thick clumps. It is a common willow in this region, and is from near the type locality, Santa Cruz.

POLYGONACEAE Lindl. Nat. Syst. Ed. 2, 211. 1836.**CHORIZANTHE MEMBRANACEA** Benth.

No. 8597, collected May 30, on the slopes beyond Hall's valley on the Mt. Hamilton road, where it was found at several places growing in gravel, the slope facing the south.

PTEROSTEGIA DRYMARIOIDES F. & M.

No. 8549, collected May 18, on Stevens creek near Soda Rock, Santa Clara county, growing in tangled masses in rich loose soil under shrubs, the leaves quite small. This is a species which occurs under many conditions and in various forms. At Bodega Bay, Sonoma county, the type locality, it grows in pure sand, while at other places it is found in crevices of rocks.

PORTULACACEAE Reichenb. Consp. 161. 1828.**Limnia gypsophiloides** (F. & M.)

Claytonia gypsophiloides F. & M. Ind. Sem. Petrop. 2: 33.
1835.

Montia gypsophiloides Howell, Erythea 1: 38. 1893.

No. 8527, collected May 10, near Smith Creek, Santa Clara county, elevation about 2200 feet, growing in moist places along the roadside. The petals were pink tinged with rose colored veins when fresh, turning pink throughout when dry. In these plants the cauline leaves are rather broad, while in specimens from north of the Bay they are mostly narrow. The type was grown from seed obtained at Fort Ross, Sonoma county. Jepson does not record it from further south than Mt. Diablo.

No. 8622, collected May 31, at an elevation of 4000 feet, near the summit of Mt. Hamilton, Santa Clara county, on disintegrating rock on a northerly slope, and not plentiful. These plants are doubtfully referred here, being stouter, more fleshy, more glaucous, the stem leaves very broad and short, and the flowers larger than usual. It is no doubt the plant Jepson mentions from the summit of Mt. Diablo.

***Limnia nubigena* (Greene)**

Claytonia nubigena Greene, *Pittonia* 2: 294. 1892.

No. 8611, collected May 31, near the summit of Mt. Hamilton, Santa Clara county, elevation 4000 feet, on a northerly slope under oak trees in damp soil, the plants low and rosette-like in growth. Noticed at only one place, although it may be abundant on the mountain. The type was collected on Mt. Tamalpais, but specimens from Mt. Diablo and Mt. Hamilton are also mentioned.

LIMNIA PERFOLIATA (Donn) Haw. Syn. Pl. Succ. 12.

Claytonia perfoliata Donn, Ind. Hort. Cantab. 25. 1796.

Montia perfoliata Howell, *Erythea* 1: 38. 1893.

No. 8487, collected April 27, back of Alum Rock Park, Santa Clara county, elevation about 700 feet, in moist shaded places in the woods, growing in leaf mould. A large but rather weak plant, the sepals usually brown but sometimes green. The same thing was seen later on Stevens Creek in the Santa Cruz mountains, and it is evidently a woodland form. Although it does not agree very well with the description of typical *perfoliata*, the type of which was collected by Menzies, probably further north than California, it is referred here for the present.

Limnia cuprea

Diffuse, growing in mat-like masses, the stems 2 dm. high or less, the whole plant coppery or bronze colored: leaves fleshy indistinctly veined; basal leaves up to 7 cm. long, nearly all petiole, the blade rhombic-ovate, about 13 mm. long, 18 mm. wide, apiculate; stem leaf situated above the middle of the stem, orbicular in outline, connate-perfoliate, 3 cm. or less in diameter: inflorescence of about five umbellate clusters of five to ten flowers, the lowest subtended by the stem leaf, the internodes 1 cm. or a little more in length except the lowest, which is about three times the length of the others, bracts none: pedicels filiform, 6 mm. long, three times the length of the fruiting calyx: calyx 2 mm. long, the sepals convex externally, round-ovate, obscurely

pointed, the one very slightly longer than the other: flowers not present in the type, but small, white, little surpassing the calyx, as noted on the living plant: capsule nearly globose, straw colored, shining, practically as long as the calyx, but included: seeds very small, less than 1 mm. in diameter, turgid lenticular, black and shining, minutely roughened, and under a good lens showing a distinct rim.

The type, in my herbarium, is no. 8501, collected May 1, 1907, near Pacific Grove, Monterey county, California, growing in a cleared place in sandy pine woods, and plentiful.

There are two specimens of this plant in the herbarium of the University of California, one collected June 6, 1893 at Pacific Grove by Ivar Tidestrom, the other at Belmont, San Mateo county, by J. Burt Davy, no. 793, June 17, 1893.

It is one of the forms referred to *Claytonia* or *Montia perfoliata*, but is easily segregated from all the others by its color, which seems to be characteristic, by its elongated lax umbellate inflorescence, and by the small seeds.

ALSINACEAE Wahl. Fl. Suec. **2**: lxxiv. 1824.

✓**ARENARIA CALIFORNICA** (Gray) Brewer in Bolander, Cat. 6. 1870
Arenaria brevifolia var (?) *Californica* Gray, Proc. Cal.
 Acad. **3**: 101. 1864.

No. 8447, collected April 20, on slopes near Lake Merced, San Mateo county, elevation about 400 feet, growing in bare places in small patches. The plants were quite small, less than two inches high. "Prof. Brewer collected the plant April 18th, in the valleys among high ridges in Sonoma, where it abounds."

CERASTIUM PATULUM Greene, Pittonia **4**: 302. 1901.

No. 8446, collected April 20, near Lake Merced, San Mateo county, elevation about 400 feet, growing on moist northerly slopes in a tangled mass of other vegetation. The sepals are hardly "very broad, obtusish," as they are about 2 mm. wide, bluntly pointed, only plainly 1-nerved instead of "strongly 3-nerved." The type was from "stony hills about San Francisco and elsewhere in middle California near the sea."

Cerastium viride

Cerastium arvense var. *maximum* Hollick & Britton, Bull. Torr. Club, **14**: pl. 54. f. 2. 1887.

Cerastium maximum Heller, Muhlenbergia **1**: 50. 1904; not L. Sp. Pl. 439. 1753.

Whether our plant is the same as the var. *maximum* of Hollick & Britton, is impossible to tell, although there is considerable resemblance to the figure, drawn from a specimen collected by Mrs. Curran near San Francisco. There is one point of disagreement, however. The capsule is not "1 ½ times longer than the calyx," but only about 2 mm. longer. At any rate, the name is a homonym, and according to recent rulings one need not respect varietal names, so it matters little what the type of their plant may be. The following is the description of our plant:

Perennial: stems ascending, rather slender and weak, 3 dm. high or less, shortly pubescent throughout and somewhat glandular above, bright green, as are also the leaves, these confined to the lower two-thirds of the stem, shortly pubescent or puberulent, ciliate, the lower ones and those on young shoots linear, scarcely broader at the base, about 2 cm. long, 2 or 3 mm. wide, the internodes 2 cm. apart; the two or three upper pairs 3 cm. long, linear-lanceolate from a base 5 mm. wide, the internodes 3 or 4 cm.; internode between last leaf and flowering branches 7 to 9 cm. long: inflorescence irregularly cymose: bracts at base of pedicels ovate-lanceolate, acute, 4 or 5 mm. long, green with hyaline margins: pedicels slender, about 3 cm. long, shortly pubescent and glandular as are the sepals, these green with hyaline margins, lanceolate, acute, 7 mm. long, 2 mm. wide at base: petals oblong, 1 cm. long, 2 mm. wide at base, 3 mm. wide across the apex, which is cleft for 2.5 mm., the sinus 1 mm. wide at top, a little narrowed but not acute at base: stamens half the length of the petals, the anthers broadly oval, 1 mm. long: capsule 9 mm. long, exceeding the calyx by 2 mm.: seeds small, about ½ mm. across, reddish brown, puberulent or somewhat tuberculate.

The type, in my herbarium, is no. 8485, collected April 27, back of Alum Rock Park, Santa Clara county, California, on and about moss covered rocks in woods on a northerly slope, elevation about 700 feet.

One of the forms referred to *C. arvensis*, but taller, weaker and greener than that species, with shorter broader sepals, and according to the description and figure in the Illustrated Flora, with narrower, not broadly notched petals.

MOEHRINGIA MACROPHYLLA (Hook.) Torr. U. S. Expl. Exped.

17: 246. 1874.

Arenaria macrophylla Hook. Fl. Bor. Am. **1**: 102. *pl.* 37.
1830.

No. 8520, collected May 10, near Smith Creek, Santa Clara county, on the grade to the summit above Hall's valley, elevation about 2300 feet, growing in moist gravel along the roadside on a northerly slope. These specimens have broader leaves and more ovate, scarious margined calyx lobes than the plant figured in the Illustrated Flora. The type was collected by Douglas in "North-West America, in shady woods."

SAGINA OCCIDENTALIS Wats. Proc. Am. Acad. **10**: 344. 1875.

Alsinnella occidentalis Greene, Fl. Fran. 125. 1891.

No. 8502, collected May 1, at Pacific Grove, Monterey county, in moist sandy places in the pine woods back of the town, abundant at one place in a cleared space. The type locality is not given, but the type is Bolander, no. 3891, Watson mentioning San Francisco as its southern limit, as does also Greene. Jepson says "southward to southern California."

TISSA MARINA (L.) Britton, Bull. Torr. Club, **16**: 126. 1889.

Tissa rubra var. *marina* L. Sp. Pl. 423. 1753.

Spergularia salina Presl, Fl. Cech. 95. 1819.

Buda marina Dumort. Fl. Belg. 110. 1827.

Spergularia media Gray, Manual, Ed. 5, 95. 1867.

No. 8496, collected May 1, at Pacific Grove, Monterey county, alongside the laboratory in a grassy place in sandy soil,

elevation about 25 feet. Referred here doubtfully, but it is nearer this species than any other. Judging from the various books consulted, the species must be an aggregate, for it appears to have no definite characters. Our plant has ovate, acuminate scarious stipules, oblong slightly narrowed sepals with broad hyaline margins, the middle green part lanceolate in outline. The petals are pale pink, elliptical-oblong, barely the length of the sepals.

TISSA PALLIDA Greene, in Britton, Bull. Torr. Club, **16**: 129. 1889.

No. 8495, collected May 1, at Pacific Grove, Monterey county, on the edge of the bluff near the laboratory, where it is common in sand, forming large mats, elevation about 25 feet. "Near San Francisco" is the type locality, but Monterey is also cited with a query.

RANUNCULACEAE Juss. Gen. 231. 1789.

CLEMATIS LASIANTHA Nutt.; T. & G. Fl. N. A. **1**: 9. 1838.

Clematitis lasiantha Greene, Fl. Fran. 294. 1891.

No. 8473, collected April 27, on steep hillsides back of Alum Rock Park, Santa Clara county, elevation about 800 feet, climbing high over shrubs and trees. It is said to be common in western California, and Jepson records it from the Sierras. Nuttall got the type at San Diego near the coast.

DELPHINIUM NUDICAULE T. & G. Fl. N. A. **1**: 33. 1838.

Delphinium sacrophyllum H. & A. Bot. Beech. 317. 1840.

No. 8479, collected April 27, back of Alum Rock Park, Santa Clara county, elevation about 700 feet, growing on damp, shaded moss covered rocks in woods. Also found at 4000 feet near the summit of Mt. Hamilton. It ranges from the Santa Lucia mountains, San Luis Obispo county, northward almost to Oregon. Douglas collected the type.

DELPHINIUM PATENS Benth. Pl. Hartw. 296. 1848.

No. 8530, collected May 10, in woods near Smith Creek, Santa Clara county, elevation 2200 feet, in rich soil under oak and pine trees. The leaves are deep green when fresh, the flowers bright violet-purple. Jepson does not mention this species in his Flora, but it is not uncommon in Santa Clara county, having been found about Los Gatos and back of San Jose, and at other places within his range further north, as Antioch, Saucelito, Calistoga, and Mark West Springs. The type was collected by Hartweg "in valle Sacramento," near Marysville.

DELPHINIUM RECURVATUM Greene

No. 8602, collected May 30, on the Mt. Hamilton road near Grand View, Santa Clara county, elevation about 1000 feet, on an open grassy bank facing the west, and not plentiful. This may be a pale form of *D. hesperium*, as it does not agree in all particulars with the description of *D. recurvatum*.

DELPHINIUM APICULATUM Greene, Pittonia 1: 285. 1889.

Delphinium variegatum var. *apiculatum* Greene, Fl. Fran. 304. 1891.

No. 8631, collected May 30, on the western slope of Mt. Hamilton above Smith Creek, Santa Clara county, at an elevation of about 2500 feet, growing in open grassy places in gravel; abundant at one place. The species is not well described, and our determination is doubtful. Our plant has large violet-blue flowers, the lower petals bearded. The type came from the "plains of the San Joaquin near Byron's Springs."

PAPAVERACEAE B. Juss. Hort. Trian. 1759.

ESCHSCHOLTZIA CALIFORNICA Cham. Hor. Phys. Berol. 73. *pl.* 15. 1820.

Omonoia Californica Raf. Fl. Tell. 2: 92. 1837.

Chryseis Californica T. & G. Fl. N. A. 1: 63. 1838.

No. 8457, collected April 25, in sand at the foot of the San Bruno hills near Colma, San Mateo county, elevation about 400 feet. This, the type of the genus, was collected in the same region, at San Francisco, and our plant is supposed to be typical. It is procumbent or prostrate from the beginning.

ESCHSCHOLTZIA GRANULATA Greene, Pittonia, **5**: 235. 1905.

No. 8571, collected May 28, on the hillside overlooking Crystal Springs near the Half Moon Bay road, in dry gravelly ground. Distributed as *E. crocea*, which it resembles only in the deep orange of the fresh flowers, being a much more spreading and branched plant with more finely dissected leaves. The type came from "fields and waysides about Stanford University, California," collected by C. F. Baker, December 1, 1901, no. 174.

ESCHSCHOLTZIA CROCEA Benth. Trans. Hort. Soc. II. **1**: 407. 1835.

No. 8607, collected May 31, on Copernicus Peak, Mt. Hamilton, Santa Clara county, elevation 4000 feet, on a grassy slope facing the west. It was very abundant there, dotting the slope with the gorgeous orange of its flowers. The flowers as a rule are smaller in this form than in the one common on the hills and in the valley about Los Gatos.

PLATYSTEMON COMMUNIS Greene, Pittonia **5**: 169. 1903.

No. 8445, collected April 20, near Lake Merced, San Mateo county, elevation about 400 feet, in sandy soil, growing usually in spreading mat-like masses. The carpels are pubescent with scattered appressed hairs. The outer stamens are a little shorter than the inner, instead of "half the length of the inner," as in the type, which was collected at San Rafael, Marin county.

BRASSICACEAE Lindl. Nat. Syst. Ed. 2, 58. 1836.

ARABIS BREWERI Wats. Proc. Am. Acad. **11**: 123. 1876.

No. 8617, collected May 31, near the summit of Mt. Hamilton, Santa Clara county, elevation 4000 feet, growing in the crevices of rocks, and rather plentiful. It is a low tufted and matted perennial, decidedly woody at the base, the type collected by Brewer on Mt. Diablo, Contra Costa county.

CARDAMINE OLIGOSPERMA Nutt.; T. & G. Fl. N. A. **1**: 85. 1838.

No. 8484, collected April 27, near the creek above Alum Rock Park, Santa Clara county, elevation about 700 feet, grow-

ing in woods in wet places under other vegetation. The plants were rather large and flaccid, due to their sheltered and shaded condition. The type was collected by Nuttall in "shady woods of the Oregon."

CHEIRANTHUS CALIFORNICUS Greene, Pittonia **3**: 133. 1896.

Erysimum Californicum Greene, Erythea **3**: 69. 1895.

No. 8478, collected April 27, on steep gravelly hills back of Alum Rock Park, Santa Clara county, growing under and near trees, the exposure northern. Our plant has smaller flowers than the type, which is a "large plant of the hills of the Mt. Diablo Range, California, growing only on open grassy summits; the pale flowers large and delightfully fragrant." The flowers of the specimens at hand are deep orange, with no evidence that they ever become pale.

DENTARIA INTEGRIFOLIA Nutt.; T. & G. Fl. N. A. **1**: 88. 1838.

Cardamine integrifolia Greene, Bull. Cal. Acad. **2**: 389. 1887.

No. 8503, collected May 1, in open wet grassy places in pine woods back of Pacific Grove, Monterey county, where it was found sparingly. This is practically from type locality, "plains of Monterey." The elevation about 200 feet.

EUCLISIA MILDREDAE Greene, Leaflets **1**: 83. 1906.

Streptanthus Mildredae Greene, Fl. Fran. 260. 1891.

No. 8626, collected May 31, on Mt. Hamilton, Santa Clara county, at an elevation of about 3900 feet, growing on a stony slope. It is from type locality. A beautiful plant with very dark metallic purple flowers, considered by some to be but a form of *Streptanthus glandulosus*.

GUILLENIA LASIOPHYLLA (H. & A.) Greene, Leaflets **1**: 227. 1906.

Turritis lasiophylla H. & A. Bot. Beech. 321. 1840.

Thelypodium lasiophyllum Greene, Bull. Torr. Club, **13**: 143. 1886.

No. 8474, collected April 27, on the hills back of Alum Rock Park, Santa Clara county, elevation about 800 feet, growing about rocks, some of the plants nearly three feet high, others barely a foot high. This is the form with stright deflexed pods as in the type, which is "very straight, unbranched."

SAXIFRAGACEAE Dumort. Anal. Fam. 36, 38. 1829.

HEUCHERA MICRANTHA Dougl.

No. 8541, collected May 11, along the road between Alma and the soda spring, Santa Clara county, elevation about 600 feet, in loose rich soil under and near shrubs in a deep ravine, the exposure northerly. The plant is not uncommon in the vicinity, rather pubescent.

LITHOPHRAGMA AFFINIS Gray, Proc. Am. Acad. **6**: 534. 1865.

Tellima affinis Bolander, Cat. 11. 1870.

No. 8464, collected April 25, on the western end of the San Bruno hills, San Mateo county, elevation about 700 feet, growing on northerly slopes in moist ground near low shrubs. Easily distinguished from *L. heterophylla* by its campanulate calyx. In these specimens the petals are all 3-toothed or rather lobed near the apex; the short, thick pistils are half the length of the calyx lobes, equaled or little exceeded by the stamens, which bend over toward the pistils. "California around and north of San Francisco, where Dr. Brewer has abundantly gathered it at several stations." Our specimens are therefore practically from type locality; the station almost within the limits of San Francisco.

LITHOPHRAGMA HETEROPHYLLA (H. & A.) T. & G. Fl. N. A.

1: 584. 1840.

Tellima heterophylla H. & A. Bot. Beech. 346. 1840.

No. 8525, collected May 10, near Smith Creek, Santa Clara county, elevation 2300 feet, along the roadside on the grade to the summit leading into Hall's valley, growing in moist shaded places, several plants commonly growing together in clump,

pulling up readily, the plants only lightly imbedded in the soil. The short pedicels and truncate calyx distinguish this from *L. affinis*, which grows along the same road in Hall's valley and near Grand View.

THEROFON CIRCINNATUM Rosend. & Rydb. N. A. Fl. **22**: 124. 1905.

No. 8545, collected May 18, on Stevens creek near Soda Rock, Santa Clara county, elevation about 800 feet in wet clayey soil under an overhanging bank, rather plentiful. The leaves of the original, collected on rocky banks of streams, Santa Cruz, California, in 1882, by C. G. Pringle, are "rather firm," while in our plant they are thin, bright green.

ROSACEAE B. Juss. Hort. Trian. 1759.

ARGENTINA ANSERINA (L.) Rydb. Mem. Dep. Bot. Col. Univ. **2**: 159. 1898.

Potentilla anserina L. Sp. Pl. 495. 1753.

Potentilla Pacifica Howell, Fl. N. W. Am. 179. 1898.

No. 8441, collected April 20, in low marshy places near Lake Merced, San Mateo county, elevation about 200 feet. The type is European, but the species is widely distributed in the United States. It is found quite generally from the Rocky mountains westward, and on the Atlantic coast ranges as far south as New Jersey and Pennsylvania, appearing again in the region of the great lakes, but is not found within the limits of Small's Flora of the Southeastern United States.

DRYMOCALLIS GLANDULOSA (Lindl.) Rydb.

No. 8532, collected May 10, at Smith Creek, at the foot of Mt. Hamilton, Santa Clara county, elevation 2100 feet, where it was found in grassy places on the edge of the woods. It usually grows in clumps, a number of stems from a thick root, and is common in the coast region.

ROSA CALIFORNICA Cham. *Linnaea* **2**: 35. 1827.

No. 8582, collected May 28, about two miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, growing on moist banks near shrubs and trees. The type was obtained near San Francisco. Our specimens agree with the original description, except that the leaves are glabrous above instead of pubescent.

MALACEAE Small, Fl. Southeast. U. S. 529. 1903.

(*Pomaceae* L. Ord. Nat. 1764.)

AMELANCHIER GRACILIS Heller, *Muhlenbergia*, **1**: 59. 1905.

No. 8531, collected May 10, near the summit of the grade between Smith Creek and Hall's valley, Santa Clara county, elevation 2300 feet. Here it is a shrub eight or ten feet high, the numerous stems forming a symmetrical mass, the whole covered at the time with many flowers. It differs in other respects from the type in having the fewer teeth at the apex of the leaf crenate rather than serrate, and the outside of the calyx smoother. It may be distinct, but I do not at present feel warranted in describing it. One thing is certain, however, and that is that we do not have *A. alnifolia* in California.

AMYGDALACEAE Reichb. *Consp.* 177. 1828.

(*Drupaceae* DC. Fl. Fran. **4**: 479. 1805.)

PADUS DEMISSA (Nutt.) Roem.

No. 8534, collected May 10, at Smith Creek, Santa Clara county, elevation 2100 feet, on wooded stream banks, rather frequent. A good sized shrub with small oval, short pointed leaves obliquely narrowed at base, the margins closely serrate with short, appressed, awn-tipped teeth, perfectly glabrous beneath, in which it differs from the original collected on "plains of the Oregon toward the sea, and at the mouth of the Wahlamet." The leaves of the type are "sharply serrate with straight teeth, often emarginate at the base, more or less pubescent beneath," the drupe red. In ours the drupe is said to be "red or dark purple" by both Greene and Jepson.

FABAŒAE Reichb. Consp. 149. 1828.

LATHYRUS BOLANDERI Wats. Proc. Am. Acad. **20**: 363. 1885.

No. 8583, collected May 28, about three miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, climbing over bushes. The type was from "thickets, Oakland Hills, Bolander and Dr. Torrey in 1865." Watson says the leaflets are "obtuse or retuse or acute." In the specimen before me they are acute, shortly apiculate. He also says "calyx teeth broad," which is not the case in our plant. In other respects it seems to agree, so far as one can tell from the description.

LATHYRUS PUBERULUS White; Greene, Manual 85. 1894.

No. 8454, collected April 20, on the western end of the San Bruno hills, San Mateo county, elevation about 600 feet, growing on open rocky hills in a tangle of other vegetation. The given range is "Sonoma county southward." I have collected it in Sonoma county and in Santa Clara county about Los Gatos. It blooms earlier than any other *Lathyrus* in the Bay region.

No. 8480, collected April 27, in woods back of Alum Rock Park, Santa Clara county, elevation about 700 feet, climbing over shrubs. This plant may be distinct as it has thinner, paler leaves than typical *puberulus*, and the calyx lobes somewhat narrower.

Lathyrus quercetorum

Low and rather rigid, erect or nearly so, 3 dm. high, the stems angled but not winged, pubescent with appressed white hairs, leafy throughout: leaves tendrill bearing, about 1 dm. long; leaflets in five or six pairs, elliptical-lanceolate, acute and cuspidate, 3 cm. or less long, the largest 1 cm wide at the middle, rather thin but firm, light green above, paler beneath, lightly flocculent on both sides, veins prominent beneath; petiolules 1 mm. long: stipules semi-sagittate, acute, less than half the size of the leaflets, the upper lobe entire, the basal one sometimes slightly toothed: flower stalks about as long or commonly shorter

than the leaves, the six to ten tawny flowers collected near the summit but not crowded: calyx villous, the tube 5 mm. long, the two upper lobes short, barely 2 mm. long, acute from a broad triangular base, the apices incurved, the sinus between broad and rounded, 3 mm. across; the three lower teeth lanceolate, acuminate, the middle one 5 mm. long, less than 2 mm. wide and nearly linear, the lateral ones a little wider and shorter: flowers 18 mm. long, banner oblong-cuneate when spread out, 7 mm. wide at base, 10 mm. at the rounded and slightly notched top; wings oblong; keel 5 mm. deep across the middle, 2 mm. at the bluntish apex.

The type, in my herbarium, is no. 8623, collected May 31, 1907, near the summit of Mt. Hamilton, Santa Clara county, California, elevation 4000 feet, growing in grassy places under oak trees on a westerly slope. Its nearest relative is perhaps *L. puberulus*, from which it differs in its rigid erect growth, paler more pubescent leaves and tawny flowers. In habit it is like the northern *L. vestitus*, but that has stipules nearly as large as the leaves, and large purple flowers on short peduncles.

Two specimens of this species are in the herbarium of the University of California, one from Mt. Hamilton collected by Greene, the other from dry hillsides, Mt. Diablo, April 30, 1862, from the State survey collection.

LUPINUS ALBIFRONS Benth.; Lindl. Bot. Reg. **19**: pl. 1642. 1833.

No. 8469, collected April 27, back of Alum Rock Park, Santa Clara county, on hillsides near shrubs, elevation about 800 feet. This species as generally accepted is no doubt an aggregate. The number here cited has a very short slender decumbent woody stem, the whole plant little over two feet high, and is the form common in Santa Clara county on low hills. It is not a true woodland species; but grows on hillsides, usually about thickets in rather dry places.

LUPINUS BICOLOR Lindl. Bot. Reg. **13**: pl. 1109. 1827.

No. 8451, collected April 20, in sandy soil in San Mateo county between the Southern Pacific and Ocean Shore tracks near Ocean View, elevation about 400 feet. It is also common in sandy soil in the western part of San Francisco near the Marine Hospital. Douglas collected the type "in the interior of the country about the Columbia River, from Fort Vancouver to the branches of Lewis and Clarke's River, always on dry gravelly soil under the shade of trees in the open plains." Piper, in Cont. U. S. Nat. Herb. **11**: 353, says: "We suspect strongly that there is some error about the type locality. The species seems to be common in California, and extends into Oregon, but no specimens from Washington have been seen." Our specimens agree fairly well with the illustration of the original, and San Francisco may really be the type locality.

LUPINUS CARNOSULUS Greene, Bull. Cal. Acad. **2**: 144. 1886.

No. 8471, collected April 27, back of Alum Rock Park, Santa Clara county, elevation about 800 feet, on roadside banks in rich stiff black soil. It is a species of the hill country, the type from "near the village of Olema, Marin County." Jepson well states its habitat when he says "especially characteristic of depressions in hills caused by recent or old land slides." But he makes the mistake of attributing this habitat to *L. affinis*, a lowland species, common in the Santa Clara valley. The two, so far as I know, never encroach, one upon the territory of the other.

Lupinus collinus (Greene)

Lupinus albifrons var. *collinus* Greene, Fl. Fran. 46. 1891.

No. 8462, collected April 25, on the western end of the San Bruno hills, San Mateo county, elevation about 700 feet, common on grassy, stony northerly slopes. The type came from "rocky summits about the Presidio, San Francisco." Our station is not more than three or four miles distant from the Presidio, and the conditions similar.

Since the original was very imperfectly described, I append the following, drawn from my no. 6592, collected at the type locality:

Perennial, silvery throughout except the flowers with appressed silky hairs: stems several, tufted from a short woody rootstock, herbaceous above ground, 2 dm. high: leaves mostly near the base, few on the flowering branches; stipules setaceous, attenuate, 6 or 7 mm. long; petioles slender, usually 6 or 7 cm. long; leaflets 7 or 8, oblanceolate, about 18 mm. long, 4 mm. or less wide above near the rounded apiculate apex: peduncles almost scape-like, the flower bearing part 1 dm. long or less: flowers more or less verticillate, violet-purple, 12 mm. long and as deep, space between apices of banner and wings 6 mm.; calyx lobes nearly equal, the upper ovate-lanceolate, 8 mm. long, 4 mm. wide at base, cleft to about the middle into oblong divisions, the lower lobe entire, narrowly lanceolate, 9 mm. long, barely 3 mm. wide: banner with the edges turned back, 3 mm. apart above, 6 or 7 mm. apart below, the whole showing a broad scoop-shaped cavity viewed from the rear, the face yellowish or whitish, channeled; wings moderately inflated, the body measuring about 5 mm. across, completely inclosing the keel, when spread out 4 mm. wide at base, 8 mm. wide near the top, the lower side being much curved and rounded in the upper half; keel glabrous, rather shallow, a little over 3 mm. deep at the middle, gradually narrowed to the acute tip.

No. 8624, collected May 31, near the summit of Mt. Hamilton, Santa Clara county, elevation 4000 feet, on a westerly grassy slope under and near a scattered growth of trees. It does not seem to differ from the typical plant from about San Francisco.

LUPINUS DENSIFLORUS Benth.

No. 8561, collected May 23, about two miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, on a gravelly bank, the flowers purplish tinged and rather closer whorled than in the typical plant.

LUPINUS FORMOSUS Greene, Fl. Fran. 42. 1891.

No. 8514, collected May 7, in a field near the Interurban track about midway between Los Gatos and Campbell, Santa Clara county, elevation 390 feet. It is a common species of the hill country in the Bay region, usually growing on grassy slopes near thickets, the several to many stems from a thick heavy root. The type came from Mare Island, near San Francisco.

LUPINUS LATIFOLIUS Agardh, Syn. 18. 1835.

No. 8529, collected May 10, near Smith Creek, Santa Clara county, elevation 2200 feet, on wooded slopes in loose rich soil among shrubs and trees. In some respects it answers better to the description of *L. cytisoides*, which has stems "striate, a little scabrous," while *L. latifolius* has "stems very smooth and shining, glabrous." Our plant has purple, striate stems, pubescent with short appressed hairs, and is hardly shining. The keel of the corolla is ciliate below the middle, while in both *cytisoides* and *latifolius* it is said to be glabrous.

No. 8562, collected May 23, about two miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, growing on a bank on the edge of the woods. The flowers were violet-purple when fresh, but turned tawny in drying.

LUPINUS MICROCARPUS Sims, Bot. Mag. 50: pl. 2413. 1823.

No. 8632, collected May 31, on the western slope of Mt. Hamilton, Santa Clara county, altitude about 2300 feet, growing on a roadside bank near oak trees, not abundant. It is said to be a native of Chili, and although one would not expect it to be found here, our plant appears to be the same, differing principally in the oblanceolate rounded leaflets, those of the original being lanceolate.

LUPINUS NANUS Dougl.; Benth. Trans. Hort. Soc. II. 1: 409.
1835.

No. 8452, collected April 20, in sandy soil near Lake Merced, San Mateo county, elevation about 400 feet, where it is

abundant, often covering large areas. A handsome annual, not well named, as it is frequently a foot high, and the flowers large. It is apparently confined to sandy open ground at no great distance from the sea from Monterey north to San Francisco in suitable situations. The type was undoubtedly from Monterey.

Lupinus Pendeltoni

Perennial from a thick heavy rootstock: stems herbaceous, numerous, 3 to 4 dm. high, erect or ascending, branched from the base, canescent with short white appressed or somewhat tangled hairs, more or less purplish above, leafy; stipules subulate, 5 or 6 mm. long, densely pubescent: petioles 3 cm. long; leaflets about 7, oblanceolate, 3 cm. long, 6 to 8 mm. wide, apiculate at the rounded apex, densely silky on both sides with short appressed hairs, midvein prominent; internodes about equaling the petioles; peduncles commonly short, only 2 or 3 cm. long, the flowering part of the stem 1 dm. or more long; bracts of the flowers 5 mm. long, setaceous, silky, deciduous: pedicels 3 mm. long, densely silky with appressed hairs, as is the calyx, which is subsymmetrical at base, lobes entire, the lower one 7 mm. long, lanceolate, the upper ovate-lanceolate, 5 mm. long, both 3 mm. wide at base: corollas pale violet purple when fresh, 1 cm. long and as deep, the space between tips of banner and wings 4 mm.; banner appearing as if a little shorter than the other parts of the flower, the edges turned back, the space between them at the upper end 3 mm. at the lower end 5 mm., presenting a scoop-shaped cavity viewed from the rear; wings moderately inflated, the body presented being 3 mm. across, open nearly the whole length below exposing the keel, when spread out measuring 5 mm. across the base, 6 mm. at the middle, narrowed again to 4 mm. at the top, the upper side straight, the lower curved; keel glabrous, 4 mm. deep to a little above the middle, then tapering to the acute apex.

The type, in my herbarium, is no. 8610, collected May 31, 1907, on Mt. Hamilton, Santa Clara county, California, eleva-

tion 4200 feet, in grassy places under and near oak trees at the base of Copernicus Peak. Dedicated to my friend, Mr. Robert L. Pendelton, a promising young botanist who shared the pleasures of a trip to this interesting botanical ground. This species has the habit and pubescence of *L. formosus*, but is a smaller plant with smaller flowers of a different structure. *L. formosus* belongs to a group which has the edges of the banner close together or overlapping near the base while the opposite is the case in this species. There is also a difference in the position of the wings; the leaflets are not "very acute," and are shorter instead of equalling the petiole.

THERMOPSIS CALIFORNICA Wats. Proc. Am. Acad. **11**: 126. 1876.

No. 8518, collected May 10, near the summit of the grade leading from Smith Creek to Hall's valley on the Mt. Hamilton road, Santa Clara county, elevation 2400 feet. The plants grew in damp soil along the roadside, in places well overgrown with grass and other vegetation. The type came from Corte Madera, Marin county. It is an elegant plant, with broad silvery leaves and numerous large deep yellow flowers.

No. 8606, collected May 31, above Aquarius Springs, Mt. Hamilton, Santa Clara county, elevation about 4000 feet. It is the var. *velutina* Greene, *Erythea* **1**: 81. 1893, from type locality. Aside from a smaller growth and a leaf slightly broader in proportion, I can see no appreciable difference in this plant. The flowers are apparently the same as in *californica*, and the slight increase in pubescence is no more than one should expect from an increase in altitude. It was also seen at considerably lower elevations on Mt. Hamilton, perhaps as low as 3000 feet.

TRIFOLIUM BARBIFERUM Torr. Pac. R. R. Rep. **4**: 79. 1857.

No. 8498, collected May 1, in pine woods, along the railroad track back of Point Pinos, Monterey county, growing in thick patches, the plants small. The type was collected "near San Francisco, April."

TRIFOLIUM CILIOLATUM Benth.

No. 8506, collected May 7, on hills west of Los Gatos, Santa Clara county, in orchards, elevation about 750 feet. It inhabits grassy gravelly slopes as a rule. The flowers are dull rose, the banner almost erect, the wings ascending and spreading, standing away from the keel, the hooded portion of which extends into a short erect point with a broad base.

TRIFOLIUM DICHOTOMUM H. & A. Bot. Beech. 330. 1840.

No. 8554, collected May 23, about three miles beyond San Mateo, San Mateo county, on the Half Moon Bay road on a grassy bank. This was sent to Professor Kennedy, who says it is the plant named variety *turbinatum* by Jepson, Fl. West. Mid. Cal. 306. 1901. To me this plant appears as if quite distinct from the plant with which Jepson placed the var. *turbinatum*, as well as from real *dichotomum*, which latter is well represented I think by my no. 7316, collected in 1904, and probably by C. F. Baker's no. 2797, collected in 1903.

TRIFOLIUM HALLII Howell, Fl. N. W. Am. 135. 1898.

Trifolium bifidum var. *decipiens* Greene, Fl. Fran. 24. 1891;
not *T. decipiens* Hornem. 1815.

Trifolium Greenei House, Bot. Gaz. 41: 334. 1906.

No. 8477, collected April 27, on grassy hillsides in gravel under trees back of Alum Rock Park, Santa Clara county, elevation about 900 feet, the plants slender. It is common in Santa Clara county, and probably in all the other counties about the Bay. Under *T. Hallii* Howell gives "open places and prairies, western Washington to California."

No. 8559, collected May 23, about three miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, on an open grassy bank in stiff black soil, the plants large and stout, branched from the base.

TRIFOLIUM MICROCEPHALUM Pursh, Fl. Am. Sept. 2: 478. 1814.

No. 8507, collected May 7, on the hills west of Los Gatos, Santa Clara county, in orchards. It is a species of fields and waysides, usually in gravelly soil, widely distributed over the western half of the country in various forms. These specimens are large and luxuriant, the procumbent branches over a foot in length, but sometimes it is depauperate, only two or three inches high. The type was collected by Lewis "on the banks of Clark's River" in Montana.

TRIFOLIUM MELANANTHUM H. & A.

No. 8504, collected May 1, in wet grassy places in the pine woods back of Pacific Grove, Monterey county. This is a small form, some of the plants only three inches high, but near at hand were larger plants of normal size with connecting forms. The type was probably obtained in this vicinity, near Monterey.

Trifolium petrophilum

Annual: stems simple or nearly so, 1 dm. high, pubescent with short white more or less appressed hairs, leafy but the leaves scattered: stipules 6 or 7 mm. long, all with an attenuate acuminate tip occupying about half the length, the lowermost with a rather narrow obliquely lanceolate base, this becoming broader, in the uppermost about 3 mm. wide, all somewhat membranous, pubescent like the stems: lowermost leaflets obovate-cuneate, 4 mm. long, 2 mm. wide, sharply serrate-dentate, prominently veined, pubescent like the stems; leaflets of the middle part of the stem more nearly elliptical, 6 mm. long 2 mm. wide, more pubescent, the uppermost ones linear, 8 mm. long, less than 2 mm. wide and still more pubescent: peduncles short, 1 to 3 cm. long; heads somewhat obovoid in shape, 1 cm. high and about as broad across the top, without involucre: calyx 8 mm. long, the tube only 2 mm. long, densely villous, 10-nerved, the lobes setaceous, beautifully plumose: corollas purple, 1 cm. long, very slender, less than 2 mm. across: banner infolding the other parts of the flower, oblong when spread out, 3 mm. wide up to the middle,

there slightly constricted, the upper part between 2 and 5 mm. wide, rounded at the apex; claw of the wings less than 1 mm. wide, the blade barely 2 mm. wide, oblong, narrowed above to a point, and with a very small rounded projection at the base; keel conforming in shape to the wings, not inflated into a hood above: legume pale, 1-seeded.

The type, in my herbarium, is C. F. Baker's no. 2625, collected April 20, 1903, on Mt. St. Helena, Napa county, California, where it is said to be "common about rocky summits."

It was distributed under the above name, with Professor Greene as the author of the species. Recently I wrote to Professor Greene, asking him to describe this and several other undescribed species bearing his name, as I expected soon to have occasion to mention them in my writings. He replied that he did not have time to attend to them, and that I should do whatever I cared to with them. I have accordingly described this species, appropriating the name, and making Baker's specimen the type rather than my own no. 8627, mentioned below. Its nearest relative is probably *T. dichotomum*.

No. 8627, collected May 31, on Mt. Hamilton, Santa Clara county, at an elevation of 4000 feet, growing about stony places near trees on a westerly slope just below the observatory. It is quite like the type from Mt. St. Helena, described above, and no doubt will be found on intervening mountain summits. Very little of it was found in good condition, but dried-up plants of apparently this species were found at several places on the mountain.

TRIFOLIUM POLYODON Greene, Pittonia, **3**: 215. 1897.

No. 8498, collected May 1, near Pacific Grove, Monterey county, in a marshy meadow back of Point Pinos. This is from type locality and typical habitat, "moist uplands along streamlets and springy places at Pacific Grove near Monterey, Calif." It is a handsome plant with yellow-green leaves and moderate sized heads of purple-red flowers. So far it has been found at no other place.

TRIFOLIUM TRICHOCALYX Heller, Muhlenbergia 1: 55. 1904.

No. 8499, collected May 1, in pine woods back of Pacific Grove, Monterey county, growing along a unused wood road. A local species, known only from this place, the type locality, where I collected it in 1903. Many of the specimens obtained this year vary from the type in that they are more erect and slender with larger leaves. It is not a showy species, the heads small, and the small purplish flowers almost concealed by the densely villous calyx.

TRIFOLIUM ACICULARE Nutt.

No. 8450, collected April 20, near Lake Merced, San Mateo county, elevation about 200 feet, in sandy soil among grass and other vegetation. Distributed as *T. tridentatum*, the calyx toothed as in that species, but it has the leaf of *aciculare*.

No. 8628, collected May 31, near the summit of Mt. Hamilton, Santa Clara county, elevation 4000 feet. Plentiful at one place below the observatory on a westerly slope under trees. This is a small slender plant three to five inches high with "teeth of the calyx simple (or rarely toothed at the base)."

TRIFOLIUM VARIEGATUM Nutt.

No. 8600, collected May 9, in Hall's valley, on the Mt. Hamilton road, Santa Clara county, elevation about 1500 feet, growing in a damp meadow, the luxuriant decumbent tangled branches two or three feet long. This has the "obovate-oblong" "minutely spinulose-serrate" leaf of the typical plant.

TRIFOLIUM VIRESCENS Greene, Pittonia 2: 223. 1892.

No. 8505, collected May 7, in an orchard in the hills west of Los Gatos, Santa Clara county, elevation about 800 feet. Perhaps an introduction, as it had not been noticed heretofore. It differs from the typical plant in that the leaves are hardly truncate, merely broadly obovate. The two upper calyx teeth are approximate but not "closely" so. That this is abundantly distinct from *T. fucatum* is easily seen when living plants of the

two are compared. This one has a flower about 15 mm. long, the banner 7 mm. long, 5 mm. wide, very slightly notched, unspotted, standing well away from the wings. The wings are oblong-oblique and pointed, nearly 3 mm. wide near the base, erect unspotted, attached to the keel, which is 2 mm. shorter than the wings, the apex of the hood purple spotted, not apiculate.

No. 8560, collected May 23, about three miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, elevation 200 feet, growing on a roadside bank in stiff black soil.

TRIFOLIUM WORMSKJOLDII Lehmn. Ind. Sem. Hort. Hamb. 17.
1825.

No. 8599, collected May 30, in Hall's valley on the Mt. Hamilton road, elevation 1500 feet, in a wet meadow in rich black soil. Plentiful and quite large, the stems often two feet long, tangled and interlaced. It was a surprise to find this species at so great a distance from the coast and at so considerable an elevation. When once known this species is easily recognized in the field, variable as it is in growth. About San Francisco (which is perhaps the type locality) as well as about Pacific Grove, where it is abundant, small forms forming a sward occur in places grazed over by cattle. It sometimes has pale and sometimes dark flowers, the heads always large.

VICIA AMERICANA Muhl.; Willd. Sp. Pl. 3: 1096. 1803.

No. 8449, collected April 20, near Lake Merced, in San Mateo county, elevation 100 feet, in sandy soil, growing in a mass among other vegetation, the stems two feet or more long. It has always seemed strange to me that this species, originally from Pennsylvania, should also be found on the Pacific slope, but the description in the Illustrated Flora shows little difference. The leaf in our plant is narrowed, not "rounded at the base," and the calyx lobes are acute, not blunt or nearly so, as shown in the illustration. There may be floral differences, but none of our descriptions mention the different parts of the flower, so there is no basis for comparison.

LINACEAE Dumort. Comm. Bot. 61. 1822.

LINUM CONGESTUM Gray, Proc. Am. Acad. **6**: 521. 1865.

No. 8572, collected May 28, in San Mateo county on the slope overlooking Crystal Springs, on the Half Moon Bay road, elevation 425 feet, growing in open places in gravelly and stony ground, plentiful in a restricted area. The type locality is "Marin county, coll. H. N. Bolander." Both Greene and Jepson mention it from Marin county only, so the species is probably somewhat rare.

EUPHORBIACEAE J. St. Hil. Expos. Fam. 276. 1805.

TITHYMALUS CRENULATUS (Engelm.) Heller

No. 8443, collected April 20, in San Mateo county near Lake Merced, elevation 100 feet, in sandy soil about clumps of shrubs but not abundant, only a scattered plant here and there. Easily recognized by the smooth capsule.

LIMNANTHACEAE Lindl. Nat. Syst. Ed. 2, 142. 1836.

LIMNANTHES DOUGLASII R. Br. in Lond. & Edinb. Phil. Mag.

2: 70. 1833.

Floerkea Douglasii Baill. Hist. **5**: 20. 1874.

No. 8538, collected May 9, in Hall's valley, Santa Clara county, elevation 1500 feet, growing in wet places in rich black soil, the plants large and spreading, the procumbent branches nearly two feet long. The petals are yellowish in the lower half, the upper half white veined with purple. Greene says "petals yellow," and Jepson has it "yellowish, white, (or occasionally roseate) at tip."

ACERACEAE J. St. Hil. Expos. Fam. **2**: 15. 1805.

ACER MACROPHYLLUM Pursh, Fl. Am. Sept. **1**: 267. 1814.

No. 8431, collected April 6, on Guadalupe creek below the Guadalupe mine, Santa Clara county, elevation about 500 feet. Not infrequent in Santa Clara county, and when growing along streams in open places it becomes a very large spreading tree. Lewis collected the type "on the great rapids of the Columbia River."

FRANGULACEAE DC. Fl. Franc. **4**: 619. 1805.*(Rhamnaceae* Dumort. Fl. Belg. 102. 1827.)**CEANOTHUS PAPILLOSUS** T. & G. Fl. N. A. **1**: 268. 1838.

No. 8633, collected June 4, on the high ridge southeast of Alma soda spring, Santa Clara county, elevation about 2000 feet, growing along the road among trees and other shrubs. It was originally collected in this region by Douglas, and is found only in the Coast range between Santa Cruz and San Francisco. The flowers are bright blue in narrow cylindrical heads, the narrow leaves rough and glandular above, pale beneath.

RHAMNUS CALIFORNICA Esch.

No. 8547, collected May 18, on Stevens creek near Soda Rock, Santa Clara county, elevation 700 feet, in deep shaded woods. This is a form with the leaves large and thin, many of them four inches long, an inch and a half wide, whitened underneath with a fine felt-like tomentum. It is a good example of protected and sheltered growth with restricted light.

ELATINACEAE Lindl. Nat. Syst. Ed. 2, 88. 1836.**ELATINE BRACHYSERMA** Gray, Proc. Am. Acad. **13**: 361. 1878.

No. 8500, collected May 1, in the pine woods back of Pacific Grove, Monterey county, elevation perhaps 200 feet, growing in depressions in an old wood road in ground merely moist at the time, but a shallow pool earlier in the season, the plants growing among pine needles. The type was collected in Illinois by E. Hall, but one specimen is mentioned from California, no. 257 of Kellogg and Harford.

VIOLACEAE DC. Fl. Franc. **4**: 801. 1805.**VIOLA OCELLATA** T. & G. Fl. N. A. **1**: 142. 1838.

No. 8433, collected April 13, near the summit of the Santa Cruz mountains back of Saratoga, Santa Clara county, elevation about 2500 feet, growing on a wooded slope facing the east, in rich loose soil. It ranges from Santa Cruz northward to at least

Lake county, where I collected it on the slopes of Mt. Sanhedrin at 4000 feet or more. A woodland species, first collected by Douglas.

VIOLA PEDUNCULATA T. & G. Fl. N. A. 1: 141. 1838.

No. 8438, collected April 20, in San Mateo county near Lake Merced, elevation 200 feet, along the Ocean Shore tracks on a grassy sandy slope, where it was plentiful. One of our handsomest species, the golden yellow petals veined with purple. An inhabitant of open grassy places, usually in gravelly soil, ranging from the Bay region to the southern end of the State in the coast region, the type collected by Douglas.

VIOLA PURPUREA Kellogg, Proc. Cal. Acad. 1: 56. 1855.

Viola Kelloggii Aven Nelson, Proc. Biol. Soc. Wash. 17: 100. 1904.

No. 8608, collected May 31, on Copernicus Peak, Mt. Hamilton, Santa Clara county, elevation 4300 feet, on a grassy slope facing westward, where it was abundant. The plants were much branched, decumbent at base, forming a mat-like mass. The leaves are "obtusely crenate" as in the original, but the upper ones are more lanceolate. Professor Nelson has made a synonym on account of mistaking 1873 as the date of publication for this species, there being a *V. purpurea* Stev. 1856.

LOASACEAE Reichb. Consp. 160. 1828.

ACROLASIA AUREA (Lindl.) Rydb.

No. 8616, collected May 31, on Mt. Hamilton, Santa Clara county, elevation 4200 feet, on the eastern slope just below the observatory. It is a very handsome species, the large golden yellow flowers with a reddish center. The specimens were collected early in the afternoon, the flowers fully open at that time. Greene says "fl. vespertine," in his Manual, and Jepson "flowers opening in the evening and remaining open during the morning of the next day." The plant mentioned under this name on page 100 is another species, perhaps *A. nitens*.

EPILOBIACEAE DC. Prodr. 3: 35. 1828.

✓ **GODETIA TENELLA** (Cav.) Wats. Bot. Cal. 1: 230. 1876.

Oenothera tenella Cav. Ic. 4: pl. 396. f. 2. 1797.

Godetia Cavanillesii Spach, Phaner. 4: 390. 1835.

No. 8552, collected May 18, in the hills west of Cupertino, Santa Clara county, on the Stevens creek road, elevation 500 feet, on grassy banks, growing in colonies, and apparently not plentiful.

AMMIACEAE Presl, Delic. Prag. 1. 1822.

LIGUSTICUM HELLERI C. & R. ined.

No. 8456, collected April 20, on the western end of the San Bruno hills, San Mateo county, elevation 500 feet, at the same place as last year, but this time in flower instead of young fruit.

SANICULA ARCTOPOIDES H. & A. Bot. Beech. 141. 1832.

No. 8444, collected April 20, in San Mateo county near Lake Merced, elevation 100 feet, in sandy soil. An inhabitant of open grassy places near the sea from Monterey northward. The broad laciniate leaves lie flat upon the ground. First collected by Menzies on the "North-West coast of America."

SANICULA MENZIESII H. & A. Bot. Beech. 142. 1832.

No. 8505, collected May 7 in flower on the hills west of Los Gatos, Santa Clara county, elevation 750 feet, under trees. Its usual habitat is thickets or in overgrown places near or under trees, but not often in deep woods. Widely distributed in the State and extending north into Washington. Menzies also collected this on the "North-West coast of America."

No. 8592, collected May 30 in fruit at Smith Creek, Santa Clara county, elevation 2150 feet, growing on the edge of a thicket. Smith Creek is in the middle Coast Range at the foot of Mt. Hamilton.

WASHINGTONIA BREVIPES C. & R.

No. 8481, collected April 27 back of Alum Rock Park, Santa Clara county, elevation 700 feet, growing in rich soil in woods, the plants about three feet high, very large and spreading. A widely distributed species, occurring also in the foothills of the Santa Cruz mountains near Los Gatos.

CORNACEAE Link, Handb. 2: 2. 1831.

CORNUS CALIFORNICA C. A. Meyer

No. 8540, collected May 11, at the Alma soda spring, Santa Clara county, elevation about 700 feet, growing in moist shaded places. A graceful shrub ten or fifteen feet high, the branches slender and willowy. The members of this genus are in need of careful study, and until they receive their determinations must necessarily be uncertain.

PRIMULACEAE Vent. Tabl. 2: 285. 1799.

DODECATHEON CRUCIATUM Greene, Pittonia 1: 213. 1888.

No. 8437, collected April 13, in Santa Cruz county near Deer Ridge Farm, summit of the Santa Cruz mountains, elevation 3000 feet, growing on a westerly slope under and near oak trees. This 4-merous plant is certainly no chance sport, as it is the only one observed over a considerable extent of territory, ranging from an elevation of 700 feet in the hills about Los Gatos to the summit of the Santa Cruz mountains. No type locality is given except "common at and about San Francisco, extending southward to Monterey."

DODECATHEON HENDERSONI Gray, Bot. Gaz. 11: 233. 1886.

Dodecatheon latifolium (Hook.) Piper, Cont. U. S. Nat. Herb. 11: 446. 1906.

No. 8430, collected April 6, on Guadalupe creek above the Guadalupe mine, Santa Clara county, elevation about 600 feet, plentiful on moist grassy banks near trees and shrubs. The five petals vary from pale pink to deep rose, and from narrow to rather wide. The leaves are thinner than those of *D. cruciatum*,

and more elongated on longer petioles. The type was collected "in Tualatin plains, Oregon." The varietal name taken up by Piper, although older, must give way to the later specific one of Gray.

ASCLEPIADACEAE Lindl. Nat. Syst. Ed. 2, 302. 1836.

GOMPHOCARPUS TOMENTOSUS (Torr.) Gray, Bot. Cal. **1**: 477. 1876.

Acerates (Anantherix) tomentosus Torr. Bot. Mex. Bound. 160. pl. 44. 1859.

Asclepias Californica Greene, Erythea **1**: 92. 1893.

No. 8596, collected May 30, near the top of the grade between Hall's valley and Smith Creek, Santa Clara county, elevation 2200 feet, on open and steep gravelly banks, not uncommon. Jepson quotes only Brewer's specimen from Mt. Diablo, overlooking Greene's record of it from Mt. Hamilton. On the plate cited above under the original description is found the name "*Asclepias tomentosa*" instead of *Acerates*, as in the text. The type came from "mountains east of San Diego, California."

CONVOLVULACEAE Vent. Tabl. **2**: 394. 1799.

CONVOLVULUS ARVENSIS L. Sp. Pl. 153. 1753.

No. 8553, collected May 18, along the roadside near Cupertino, Santa Clara county, elevation 200 feet. A widely distributed species, native of Europe, with us blooming the greater part of the year.

CONVOLVULUS SUBCAULIS (H. & A.) Greene, Manual 265. 1894.

Calystegia subcaulis H. & A. Bot. Beech. 363. 1840.

Convolvulus californicus Choisy, DC. Prodr. **9**: 405. 1845.

No. 8557, collected May 23, about three miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, elevation 200 feet, growing in stiff black soil along the roadside. The leaves on these plants are somewhat elongated, acute, hastate at base.

No. 8567, collected May 24, in orchards on the hills west of Los Gatos, Santa Clara county, elevation 750 feet, the leaves rounded at the apex, almost truncate at the base. The type has ovate-hastate, obtuse, mucronulate leaves.

POLEMONIACEAE DC. Fl. Franc. **4**: 645. 1805.

GILIA ACHILLEFOLIA Benth. Bot. Reg. **19**: under *pl.* 1622. 1833.

No. 8475, collected April 27, back of Alum Rock Park, Santa Clara county, elevation 700 feet, growing on steep gravelly slopes in sheltered places, with rather many large violet purple flowers.

GILIA GILIOIDES (Benth.) Greene, Erythea **1**: 93. 1893.

Collomia gilioides Benth. Bot. Reg. **19**: under *pl.* 1622. 1833.

No. 8533, collected May 10, at Smith Creek, Santa Clara county, elevation 2150 feet, in grassy places on the edge of a thicket. This is an erect, branched plant, rather different in appearance from some of the forms placed under this name, but it may be the typical plant, as it agrees pretty well with the short description of the original.

GILIA MULTICAULIS Benth. Bot. Reg. **19**: under *pl.* 1622. 1833.

No. 8550, collected May 18, on Stevens creek near Soda Rock, Santa Clara county, elevation 700 feet, growing about shrubs in partly shaded places. There is great diversity in growth, some of the plants nearly two feet high and branched, with several flowers in a cluster, while other plants were small, little branched, the flowers solitary. These smaller plants are a true variety, and probably have a name. Douglas collected the type somewhere in the coast region.

GILIA MILLEFOLIATA F. & M. Ind. Sem. Hort. Petrop. **5**: 35. 1838.

No. 8513, collected May 7, along the Interurban tracks at the crossing of Los Gatos creek near Campbell, Santa Clara

county, elevation 200 feet, growing between the ties and near the track. This is a large loose form, not typical. The type was collected at Bodega bay, Sonoma county.

Dactylophyllum liniflorum (Benth.)

Gilia liniflora Benth. Bot. Reg. **19**: under *pl. 1622*. 1833.

Linanthus liniflorus Greene, Pittonia **2**: 254. 1892.

No. 8573, collected May 28, on the ridge overlooking Crystal Springs, near the Half Moon Bay road, San Mateo county, elevation 425 feet, in an open grassy field, commonly growing in patches, the ground gravelly. The flowers when fresh were pure white without purple veins, the plants mostly smaller than the typical form found in sandy places near San Francisco.

Dactylophyllum ambiguum (Rattan)

Gilia ambigua Rattan, Bot. Gaz. **11**: 339. 1886.

Linanthus ambiguus Greene, Pittonia, **2**: 256. 1892.

No. 8319, collected near Smith Creek, Santa Clara county, elevation 2200 feet, on May 10, growing abundantly in open grassy places, often in thick masses, the flowers rose color when fresh. The type was collected at "Oak Hill four miles south of San Jose."

No. 8614, collected May 31, on the western slope of Mt. Hamilton, Santa Clara county, elevation 3500 feet, in open gravelly places. Abundant on the mountain slope, the plants more branched from the base than those from Smith Creek, and the calyx commonly reaching to the flower lobes. The flowers open about eight o'clock in the morning, if the day is clear, and close before dark.

HYDROLEACEAE H. B. K. Nov. Gen. **3**: 125. 1818.

(*Hydrophyllaceae* Lindl. Nat. Syst. Ed. 2, 271. 1836.)

EUCRYPTA CHRYSANTHEMIFOLIA (Benth.) Greene, Bull. Cal. Acad. **1**: 200. 1885.

Ellisia chrysanthemifolia Benth. Trans. Linn. Soc. **17**: 274
1837.

No. 8467, collected April 27, back of Alum Rock Park, Santa Clara county, elevation 800 feet, growing in moist shaded places along the roadside. It ranges from the Bay region south to southern California near the coast.

HYDROPHYLLUM OCCIDENTALE (Wats.) Gray, Proc. Am. Acad.

10: 314. 1875.

Hydrophyllum macrophyllum var. *occidentale* Wats. Bot.

King Rep. 248. 1871, in part.

No. 8613, collected May 31, on Mt. Hamilton, Santa Clara county, at 4100 feet elevation, on the ridge between the observatory and Copernicus peak, growing in loose soil under shrubs. The leaves are thickish, densely white tomentose beneath, the calyx very hispid its lobes acute, not obtuse, as originally described. Whether this is typical *occidentale* one cannot tell, as the original description is very poor, and later ones not much better. The type, taking the first specimen mentioned by Watson, was collected by Dr. Bigelow on "hill-sides, Duffields Ranch, Sierra Nevada," near Auburn, Placer county (see Pac. R. R. Rep. 4: 125).

NEMOPHILA AURITA Lindl.

No. 8516, collected May 18, on Stevens creek near Soda Rock, Santa Clara county, elevation 700 feet, in moist places climbing over shrubs. Also found in the foothills of the middle Coast Range back of San Jose, but does not occur north of the Bay.

NEMOPHILA INSIGNIS Dougl.

No. 8523, collected May 10, near Smith Creek, Santa Clara county, elevation 2200 feet, on grassy slopes near trees, and very abundant.

NEMOPHILA LINIFLORA F. & M. Sert. Petrop. *pl.* 8. 1836.

No. 8436, collected April 13, in Santa Cruz county, summit of the Santa Cruz mountains, at Deer Ridge Farm, elevation 3000 feet. It is a handsome species, the large bluish tinged

corolla veined and dotted with purple. Common on the hills about Los Gatos, and apparently all through the Santa Cruz mountains on grassy slopes. The type came from "Nova-California, ad portum Bodega," Sonoma county. Jepson does not recognize this species in his Flora.

NEMOPHILA KELLOGGII Eastw. Bull. Torr. Club **28**: 147. 1901.

No. 8620 collected May 31, on Mt. Hamilton, Santa Clara county, elevation 4000 feet, growing on a northerly slope below the observatory under oak trees, not plentiful. Determined by Miss Eastwood. The type was collected "in the Santa Cruz Mountains."

PHACELIA BREWERI Gray, Proc. Am. Acad. **10**: 317. 1875.

No 8615, collected May 31, on Mt. Hamilton, Santa Clara county, elevation 4200 feet, a short distance beyond the observatory in dry open places along the roadside, the exposure eastern. Mt. Diablo in Contra Costa county is the type locality, and it is known from but few mountain peaks south of San Francisco bay.

PHACELIA CALIFORNICA Cham.

No. 8460, collected April 25, on the western end of the San Bruno hills, San Mateo county, growing on the western slope about rocks among other vegetation in granite. This is the typical form with dense heavy inflorescence, the flowers lilac purple, the thickish leaves densely pubescent.

PHACELIA DISTANS Benth. Bot. Sulphur, 36. 1844.

No. 8494, collected May 1, at Pacific Grove, Monterey county, a short distance beyond the railroad station, elevation about 100 feet, growing in sand and cinders, the plants mostly erect, varying from two or three inches to nearly two feet high. The type was collected at Bodega Bay, Sonoma county, where it is plentiful, extending back from the ocean for several miles on gravelly hills, the plants usually procumbent. The flowers are a dull brownish yellow.

PHACELIA DIVARICATA (Benth.) Gray, Proc. Am. Acad. **10**: 325. 1875.

Entoca divaricata Benth. Trans. Linn. Soc. **17**: 278. 1837.

No. 8429, collected March 30, in an orchard in the hills west of Los Gatos, Santa Clara county, elevation about 800 feet. Although said by Jepson to be "common on open hillsides in the Coast Range of middle California," this is my first collection of the plant. It is not plentiful at the station recorded above, and may disappear when the orchard is again cultivated. For a detailed account of the plant see Muhlenbergia **3**: 71.

PHACELIA LEPTOSTACHYA Greene, Erythea **2**: 190. 1894.

No. 8466a, collected April 25, on the western end of the San Bruno hills, San Mateo county, elevation 600 feet, growing about granite rocks among other plants. Our plant is not typical, as the racemes are terminal rather than "placed at intervals up and down the whole plant, and the corolla is rather large, well exerted from the calyx. It is probably the form recorded at the end of the description as "common on sandy or rocky hills at San Francisco." The type was collected at Alameda, where it was "abundant in sandy soil, under oak trees, and even along the less frequented and newer streets."

No. 8488, collected April 27, back of Alum Rock Park, Santa Clara county, elevation 600 feet, on the creek bank about rocks in moist shaded places. This form is perhaps more nearly typical than no. 8466a, having shorter corollas. Jepson has omitted this species from his flora, perhaps considering it the same as *P. distans*.

PHACELIA NEMORALIS Greene, Pittonia **1**: 141. 1887.

No. 8586, collected May 30 at Smith Creek, Santa Clara county, elevation 2150 feet, on a wooded bank in rich loose soil about shrubs. This departs from the type in having more or less compound leaves, the stinging hairs less numerous, and the flowers apparently larger. Perhaps distinct.

BORRAGINACEAE (Lindl.) Gray, Man. Ed. 2, 319. 1856.

ALLOCARYA CHORISIANA (C. & S.) Greene, Pittonia **1**: 13. 1887.

Myosotis Chorisiana C. & S. Linnaea **4**: 444. 1829.

Eritrichium Chorisianum DC. Prodr. **10**: 130. 1846.

Eritrichium connatifolium Kellogg, Proc. Cal. Acad. **2**: 103.

f. 51. 1861.

Krynitzkia Chorisiana Gray, Proc. Am. Acad. **20**: 267.

1885.

No. 8439, collected April 20, in San Mateo county near Lake Merced, elevation 200 feet, in wet sandy ground, growing in patches of numerous plants as is the habit in this genus. The type was collected "ad portum Sti. Francisci novae Californiae."

ALLOCARYA STIPITATA Greene, Pittonia **1**: 19. 1887.

No. 8512, collected May 7, along the Interurban tracks near the crossing of Los Gatos creek above Campbell, Santa Clara county, elevation 250 feet, in moist depressions where water had stood during the winter. Plentiful at this place. No type locality is given, merely that "this is the commonest of all the species in the central part of California, being abundant in all moist meadow lands, and along the margins of pools and ditches." Mrs. Brandegee, in *Zoe* **5**: 94-95. 1901, tries to refer this, or rather *A. salina* Jepson, Fl. Mid. West. Cal. 441. 1901, to *Lithospermum glabrum* Gray. If she is correct Gray made a very unfortunate "slip of the pen," but the description of the nutlets would seem to indicate two different plants.

Amsinckia parviflora

Stems 3 to 5 dm. high, rather strict, hispid with straight bristle-like hairs as well as somewhat strigose, leafy, but the leaves rather remote, linear-oblong, 5 to 10 mm. wide, the largest 5 or 6 cm. long, the shortly apiculate apex acute, or merely acutish in the larger ones, hispid, especially above, with appressed bristle-like hairs from a pustulate base, midvein prominent beneath: spikes dense above, loosely flowered below, 1 dm. long or less, but probably much elongated when in full fruit: flower-

ing calyx 4 mm. long, 6 or 7 mm. in fruit, strigose and hispid like the stem, especially the tube, less so on the linear lobes, these 1 mm. wide: corollas pale yellow, small, barely exerted from the calyx, 5 mm. long, the tube cylindrical, between 3 and 4 mm. long, the lobes somewhat ovate, 1 mm. wide and only a little longer, rounded at apex: stamens equaling the corolla tube: pistil the length of the stamens, the stigma somewhat 3-lobed: nutlets 2 mm. long, ovoid, curved and the back sharply keeled, this dotted with points, as are also the irregular transverse ridges, the intervening spaces with shorter points.

The type, in my herbarium, is no. 8470, collected April 27, 1907, back of Alum Rock Park, Santa Clara county, California, elevation 1000 feet, on open grassy slopes, not plentiful. What seems to be the same plant is found in the hills west of Los Gatos. It is one of the forms referred to *A. intermedia*, but may easily be recognized by its small pale flowers. *A. intermedia* has deep yellow flowers two or three times larger, and since the nutlets were not described, the identity of the plant cannot well be settled until good specimens are obtained from Bodega Bay, the type locality.

AMSINCKIA SPECTABILIS F. & M. Ind. Sem. Hort. Petrop. 2:
26. 1835.

No. 8555, collected May 23, about three miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, elevation 200 feet, growing on a moist grassy bank, the exposure northerly. This has a rather large bright orange corolla, the lobes obovate with folds at the base. The stamens are unequal, three of them inserted at the top of the corolla tube, the other two about half way up the tube. The pistil extends to the shorter stamens, the stigma capitate. The type was grown from seeds sent from Bodega Bay, Sonoma county.

CRYPTANTHE LEOCARPA (F. & M.) Greene, Pittonia **1**: 117.
1887.

Echinosperrnum leiocarpum F. & M. Ind. Sem. Hort. Petrop.
2: 36. 1835.

Krymitzkoa leiocarpa F. & M. Ind. Sem. Hort. Petrop. **2**:
52. 1841.

No. 8493, collected May 1, on the sand hills several miles beyond Castroville, Monterey county, elevation perhaps 200 feet along the Monterey branch of the railroad, where it is common. The type was grown from seed collected at Fort Ross, Sonoma county.

CRYPTANTHE PUMILA Heller, Muhlenbergia **2**: 242. 1906.

No. 8588, collected May 30, near Smith Creek, Santa Clara county, elevation 2150 feet, on a wooded slope among shrubs in rich loose soil. The same thing, in part, at least, is my no. 7458, distributed as *C. Torreyana*, from the hills west of Los Gatos, growing under similar conditions, the elevation about 1500 feet. Mrs. Brandegee considers this a mere state of *C. leiocarpa*, but two plants differing so in habitat and appearance cannot possibly be the same.

CYNOGLOSSUM GRANDE Dougl.; Lehm. Pug. **2**: 25. 1830.

No. 8428, collected March 10, on the hills west of Los Gatos, Santa Clara county, elevation 900 feet, growing on the edges of thickets. It ranges from Monterey northward in the coast region. The type was collected by Douglas "in shady woods, N. W. coast."

LAMIACEAE Lindl. Nat. Syst. Ed. 2, 275. 1836.

ACANTHOMINTHA LANCEOLATA Curran, Bull. Cal. Acad. **1**: 13.
1884.

No. 8605, collected May 31, on Mt. Hamilton, Santa Clara county, at Aquarius Spring, elevation 3850 feet, on steep gravelly slopes. The leaves of these specimens are more ovate than lanceolate, and the flowers very slightly pink tinged, not "rose

color." The type was collected in Calaveras Valley, Alameda County," and the species has since been found as far south as San Luis Obispo county.

RAMONA GRANDIFLORA (Benth.) Briquet, Natuerpfl. 4:

Audibertia grandiflora Benth. Lab. 312. 1833.

Salvia spathacea Greene, Pittonia 2: 236. 1892.

No. 8459, collected April 25, on the western end of the San Bruno hills, San Mateo county, elevation 700 feet, growing in rocky or stony places with other abundant vegetation. Greene did not include this and several other species in his genus *Ramona*, and no doubt with good reason, but they probably do not belong in *Salvia*. That genus as at present received is an aggregate, and some day will be split up into various genera, some of them probably monotypic.

POGOGYNE SERPYLLOIDES (Torr.) Gray, Proc. Am. Acad. 7:

386. 1868.

Hedeoma? *serpylloides* Torr. Pac. R. R. Rep. 4: 123. 1857.

No. 8535, collected May 10, at Smith Creek, Santa Clara county, elevation 2150 feet, in grassy places near thickets. This little plant has both the odor and appearance of *Hedeoma*, and it seems out of place in *Pogogyne*, the true species of which have large showy flowers. The type was collected on "hill-sides, Martínez," Contra Costa county.

Stachys viarum

Branched from the base, the branches at first decumbent, then ascending, 3 dm. long, dull green, quadrangular, retrorsely scabrous on the angles with short white pustulate-based spines, leafy throughout but the leaves scattered, coarsely crenate, firm and somewhat coriaceous, those below the inflorescence ovate, the largest 6 cm. long, 4 cm wide at base, 1.5 cm. across the rounded obtuse apex, all truncate or nearly so at base and petioled, the petioles of the lower ones half as long as the blade, of the upper ones about one-fourth as long, those subtending the

flowers reduced to sessile bracts, the lowest broadly lanceolate, barely acute, as long as or longer than the flowers, the others gradually reduced and becoming obovate, the uppermost shorter than the calyx: flowering rachis 1 to 2 dm. long: flowers very shortly pedicelled, the whorls remote, the lowermost 2 or 3 cm. apart, gradually becoming closer toward the summit: calyx narrowly campanulate, 6 mm. long, hirsute with rather long spreading hairs with shorter ones beneath, rather prominently 10-nerved, the lobes somewhat unequal, about 2 mm. long, triangular, acute, spinescent tipped: corollas 12 mm. long, shortly pubescent externally, pinkish mottled with darker dots, the tube slightly exserted from the calyx, at base 3 mm. wide for an equal length, above that widening to 4 mm. from a blunt spur-like base on the lower side, the hairy ring on the inside extending obliquely upward from the base of the spur; upper lip concave, 3 mm. across, the apex rounded, entire; lower lip about 5 mm. wide, the lower edges of the terminal lobe downcurved, the broad rounded apex somewhat upcurved, the lateral lobes also downcurved, especially at apex, the whole when spread out 8 mm. long, 7 mm. wide, the lateral lobes not protruding and the opening between the lobes completely closed: stamens inserted at the top of the throat, 2 mm. shorter than the upper lip, densely woolly in the lower half: style equaling the stamens, 2-lobed at apex, the lobes diverging.

The type, in my herbarium, is no. 8581, collected May 28, 1907, about three miles beyond San Mateo, San Mateo county, California, on the Half Moon Bay road, elevation 300 feet, in rather bare gravelly ground along the roadside, the exposure northerly. The leaves are roughened above with scattered short appressed clear hairs, the under side sparingly covered with shorter hairs of the same kind especially the veins, the margins shortly ciliate. It is a member of the medly of plants called *Stachys bullata* in the Synoptical Flora. The type of that species is densely villous, has approximate whorls, and the calyx teeth are not awn pointed.

Stachys quercetorum

Perennial from rootstocks: stems about 6 dm. high, rather weak but erect or ascending, light green, pubescent on the angles with short spreading (or below somewhat retrorse) clear hairs, simple below, bearing one or two pairs of slender branches above: leaves remote, shorter than the internodes, large and thin, bright green, broadly ovate, the larger middle ones about 8 cm. long exclusive of the petiole of 2 cm., 5 cm. wide, coarsely crenate, rounded at the apex, the base somewhat cordate or truncate, sparingly appressed pubescent with short clear hairs above and on the veins beneath, the margins somewhat ciliate, veins rather prominent; lower leaves smaller, the petiole equaling or exceeding the blade; the upper leaves also smaller, the petioles short; the first pair of floral leaves oblong, nearly sessile, a little longer than the flowers, the others equaling or shorter than the calyx, more or less obovate in shape, awn pointed, the few teeth sharp instead of rounded: whorls rather remote, the lower about 2 cm. apart: calyx 5 or 6 mm. long, moderately campanulate, 10-nerved, pilose, but not densely so, the lobes less than 2 mm. long, triangular, prominently awn pointed: corollas pinkish mottled with rose-purple, about 14 mm. long, pubescent externally especially the upper lip, the tube exerted 3 or 4 mm. from the calyx, 2 mm. across the base for a space of 2 mm. then enlarged to 3 mm. by a sac or spur-like projection on the lower side, the ring of hairs on the inside extending obliquely upward from this; upper lip concave, about 2 mm. across, the apex curved slightly backward; lower lip about 6 mm. wide, the terminal lobe broadly rounded its edges a little turned up except at base, the lateral lobes somewhat downcurved, the whole lip round ovate in outline when spread out, the sinus between the lobes open and rounded, 1 mm. wide at base 2 mm. at the top: stamens 3 mm. shorter than the upper lip, densely woolly in the lower half: style extending to the ends of the filaments, 2-lobed, the lobes moderately divergent.

The type, in my herbarium, is no. 8577, collected May 28, 1907, above Crystal Springs, San Mateo county, California, on the Half Moon Bay road, elevation 450 feet, in shade under oak trees among an abundance of other plants. Very distinct from *C. californica*, with which it has been confused, by its very much thinner, broader leaves, and comparatively scanty pubescence. *S. californica* has a thick, narrower, more pointed leaf, with dense short pubescence.

STACHYS CHAMISSONIS Benth. *Linnaea* **6**: 80. 1831.

No. 8563, collected May 23, about two miles beyond San Mateo, San Mateo county, elevation 100 feet, on the Half Moon Bay road, growing in rich and damp, partly shaded places along the creek. It is a large plant with deep pink flowers. The determination is somewhat doubtful, as the pubescence on the angles of the stem is hardly made up of "rigid downcurved prickly-like hairs," the leaves are ovate-lanceolate, acute, not "ovate, obtuse," and the whorls are close, not "distant." It has somewhat the appearance of *S. californica*.

Stachys gracilenta

Perennial from rootstocks: stems slender, strict, 2 to 4 dm. high, purplish below, hispid, especially on the angles, with slender spreading clear hairs: leaves oblong or elliptical, shorter than the internodes, truncate or rounded at base, the largest on the middle part of the stem, these 4 cm. long, some of them nearly 2 cm. wide, all crenate, rather prominently veined, blunt or the uppermost acutish, the lower sparingly the upper densely pilose, the lower on petioles as long or longer than the blade, the uppermost nearly or quite sessile; floral leaves similar in shape, the lowermost longer than the flowers, the upper not exceeding the calyx, densely pilose: flowers in six to eight remote whorls on the larger plants, pinkish, mottled and lined with rose. calyx narrowly campanulate, in flower 5 mm. long, densely villous, the lobes barely 2 mm. long, triangular, awn-tipped: corollas 12 mm, long, pubescent externally, especially on the

upper lip, the tube well exerted from the calyx, 2 mm. across at the base, this width extending for 2 mm., then enlarged to 3 mm. with a slight saccate body on the lower side, the hairy ring on the inside extending obliquely upward from this; upper lip concave, 2 mm. across, entire and rounded at the apex; lower lip in the natural state appearing narrow, only 3 mm. wide by the turning down of the edges, but when spread out obovate-cuneate, 8 mm. wide across the middle where the lateral lobes project laterally, but with no open sinus between them and the terminal lobe: stamens 2 mm. shorter than the upper lip, woolly in the lower half: style extending to the anthers, two lobed, the lobes divergent.

The type, in my herbarium, is no. 8574, collected May 28, 1907, on the slope above Crystal Springs, San Mateo county, California, on the Half Moon Bay road, elevation 450 feet, in a field in damp grassy places. It is remarkably distinct from any of the known coast forms, and was at once recognized as undescribed, differing in its slender erect habit, green appearance, comparatively narrow leaves and narrow flowers.

SCUTELLARIA TUBEROSA Benth. Lab. 441. 1834.

No. 8521, collected May 10, near Smith Creek, Santa Clara county, elevation 2150 feet, growing in shade in rich ground in the creek bottom. The plants are unusually tall, with broad and thin leaves. It is not uncommon in the Santa Cruz mountains, and has been recorded from Napa county south to southern California, the type collected by Douglas.

RHINANTHACEAE J. St. Hil. Expos. Fam. 1: 227. 1805.

(*Scrophulariaceae* Lindl. Nat. Syst. Ed. 2, 288. 1836.)

CASTILLEJA AFFINIS H. & A. Bot. Beech. 154. 1833.

No. 8442, collected April 20, in San Mateo county near Lake Merced, elevation 200 feet, in dry sandy soil on a westerly slope. The leaves are broad and comparatively short. The type was apparently collected somewhere in this neighborhood.

CASTILLEJA DOUGLASH Benth. DC. Prodr. **10**: 530. 1846.

No. 8528, collected May 10, near Smith Creek, Santa Clara county, elevation 2200 feet, on a wooded slope growing among shrubs. The same thing occurs on grassy hillsides about Los Gatos and at other places in the Santa Cruz mountains. Douglas collected the type somewhere in this region.

COLLINSIA BICOLOR Benth.

No. 8472, collected April 27, back of Alum Rock Park, Santa Clara county, elevation 800 feet, on grassy banks near trees. This is the typical form with large flowers, the upper petals deep rose, the lower ones pale. The lobes of the upper lip are oblong, either notched or entire, the throat open showing a pronounced cavity. The dorsal side of the upper lip is raised and spur-like at the base. The flowers are clustered on very short pedicels. The type was obtained by Douglas, probably at Monterey, where it is not uncommon. In the Synoptical Flora Gray says the throat is "full as broad as long," which is by no means the case, as it is 7 mm. long, barely over 1 mm. at base, enlarged to between 3 and 4 mm. above, but is about 5 mm. deep.

COLLINSIA FRANCISCANA Bioletti, Erythea **1**: 17. 1893.

No. 8463, collected April 25, on the western end of the San Bruno hills, San Mateo county, elevation 500 feet, growing in profusion in a tangle of other vegetation, especially on northerly slopes. This might easily be mistaken for *C. bicolor*, as it resembles it in habit and size of flower, but is distinguished by its more scattered pediceled flowers, and in the living state by the closed throat, the lower lip fitting close against the base of the upper one. While the dorsal side of the upper lip is slightly curved, it is not raised and spur-like. Jepson considers this a form of *C. sparsiflora*, on account of the pedicelled flowers, but the two are quite distinct.

No. 8580, collected May 28, about four miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, elevation

300 feet, growing in moist places along the roadside, the exposure northerly. At this time the flowers had nearly all fallen, the few remaining ones somewhat smaller than the early spring ones. This is the most southerly station recorded, the type from near San Francisco.

COLLINSIA SPARSIFLORA Ind. Sem. Hort. Petrop. **2**: 33. 1835.

No. 8539, collected May 9, on the grade leading into Hall's valley, Santa Clara county, elevation 1750 feet, growing along the roadside on grassy northerly slopes. The flowers are very small, not over 3 or 4 mm. in length, but in similar situations near Smith Creek some plants were found with flowers almost again as large, the two forms growing together. In the original the flower is described as intermediate between that of *C. grandiflora* and *C. parviflora*. The type locality is Fort Ross, Sonoma county.

MIMULUS ARVENSIS Greene, Pittonia **1**: 37. 1887.

No. 8517, collected May 10, near the summit of the grade leading from Smith Creek into Hall's valley, Santa Clara county, elevation 2250 feet, in wet places along the roadside. The stems are rather robust, though only about 15 inches high, but it has the white-villous floral leaves of the typical plant. No type locality is specified, but specimens are cited from Lake, San Mateo and Marin counties. I have it from Sonoma county and from the Santa Cruz mountains back of Los Gatos.

MIMULUS NASUTUS Greene

No. 8591, collected May 30, near Smith Creek, Santa Clara county, elevation 2150 feet, in damp places in a ravine near shrubs. The plants were mostly of large size and upright habit as is usually the case when growing in the open. A weak and spreading form is found under overhanging rocks or in places much shaded. It has quadrangular stems. The type came from Knight's valley, Sonoma county.

ORTHOCARPUS DENSIFLORUS Benth. Scroph. Ind. 13. 1835.

No. 8492, collected May 1, on the sand hills beyond Castroville, Monterey county, elevation perhaps 200 feet, on the Monterey branch of the railroad. This sand hill form, which is also found about San Francisco, has green bracts tipped with white, and seems to be confined to the immediate vicinity of the sea.

ORTHOCARPUS FAUCIBARBATUS Gray, Pac. R. R. Rep. 4: 121.
1857.

No. 8491, collected May 1, at Castroville, Monterey county, elevation less than 100 feet, where it is plentiful in meadows. This is a white flowered form fading pinkish. The calyx lobes seem to be shorter than the typical yellow flowered form first collected at Corte Madera, Marin county, where it is common in grassy places.

ORTHOCARPUS LITHOSPERMOIDES Benth. Scroph. Ind. 12. 1835.

No. 8579, collected May 28, above Crystal Springs, San Mateo county, on the Half Moon Bay road, elevation 450 feet, in damp grassy places in a field. These plants are more strict and slender with smaller more greenish-yellow flowers than are specimens collected north of the Bay. In habit this species is not a *Triphysaria*, neither are the flowers of the proper shape.

ORTHOCARPUS PURPURASCENS Benth.

No. 8515, collected May 7, in level fields between Los Gatos and Campbell, Santa Clara county, elevation 390 feet. This is the ordinary purple bracted form. The species has an interesting distribution in Santa Clara county. It is rather common in the valley, almost absent from the foothills of the Santa Cruz mountains, at least about Los Gatos and Saratoga, but appears at considerable elevations in the mountains east of the valley on the Mt. Hamilton road, occurring up to at least 2000 feet.

ORTHOCARPUS PUSILLUS Benth. Scroph. Ind., 12. 1835.

No. 8440, collected April 20, in San Mateo county in grassy places along the Ocean Shore tracks not far from Lake Merced, elevation 300 feet. Why this species is included in *Triphysaria* is not clear to me. It has the habit of those species, and that is all. The flower is far from being similar, as one may easily see even from dried specimens. The type was collected by Douglas somewhere in the middle coast region of California.

No. 8490, collected May 1, at Castroville, Monterey county, elevation less than 100 feet, in meadows. Jepson makes no mention in his *Flora* of having seen this species from south of San Francisco. It is plentiful on the hills west of Los Gatos in gravelly ground.

ORTHOCARPUS VERSICOLOR (F. M.) Greene, Manual 283. 1894.

Triphysaria versicolor F. & M. Ind. Sem. Hort. Petrop. 2:
52. 1835.

No. 8453, collected April 20, in San Mateo county in sandy ground near Ocean View, where it is plentiful, coloring great areas in early spring. The flowers here are mostly white or pink tinged, occasionally a plant with the flowers all pale rose, and this latter is no more than a mere color variation. But at Fort Ross, in Sonoma county, where it is also abundant the flower is two-colored from the beginning. In whatever form it occurs, it is quite distinct from *O. erianthus*, a yellow flowered species inhabiting interior regions more remote from the sea.

PENTSTEMON HETEROPHYLLUS Lindl. Bot. Reg. 22: pl. 1899.
1836.

No. 8516, collected May 10, near the summit of the grade between Hall's valley and Smith creek, Santa Clara county, elevation 2000 feet, on steep gravelly banks. The plant is somewhat shrubby at base, nearly two feet high, freely branched. "A native of California, where the seeds were collected by Mr. Douglas." The seeds collected in California were sent from Monterey, and are supposed to have been collected in that neighborhood, but some of them were undoubtedly obtained elsewhere.

SCROPHULARIA CALIFORNICA Cham.

No. 8457a, collected April 25, on the western end of the San Bruno hills, San Mateo county, elevation 500 feet, in damp places about granite rocks, the plants rather stout and low, two or three feet high. This is the typical form from near type locality, San Francisco.

No. 8585, collected May 28, about two miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, elevation 100 feet, in rich shaded ground along the creek, the plants five or six feet high. This also has flowers of the typical kind.

SCROPHULARIA FLORIBUNDA (Greene) Heller, Muhlenbergia 2:
246. 1906.

Scrophularia californica var. *floribunda* Greene, Manual
273. 1894.

No. 8489, collected April 27, back of Alum Rock Park, Santa Clara county, elevation 600 feet, growing on the creek bank about rocks in partly shaded places. It is the only form in the foothills about Los Gatos on the opposite side of the Santa Clara valley, and is quite distinct from *S. californica* in its brighter green color, more pointed and saliently toothed leaves, more paniculate branched inflorescence, and smaller, shorter maroon flowers.

TONELLA TENELLA (Benth.) Heller, Muhlenbergia 1: 5. 1900.

Also Jepson, Fl. W. Mid. Cal. 400. 1901.

Collinsia tenella Benth. DC. Prodr. 10: 593. 1846.

Tonella collinsioides Nutt. as synonym in Benth. l. c.

No. 8486, collected April 27, back of Alum Rock Park, Santa Clara county, elevation 600 feet, growing in moist places in the woods in shade. It is by no means a rare plant, but inconspicuous, and has apparently not been recorded from further south than Santa Clara county. The type was collected in "woods near the river Oregon" by Nuttall.

RUBIACEAE B. Juss. Hort. Trian. 1759.

GALIUM ANDREWSII Gray, Proc. Am. Acad. **6**: 537. 1865.

No. 8619, collected May 31, on Mt. Hamilton, Santa Clara county, elevation 4000 feet, growing about rocks on the western slope just below the observatory. It is said to occur on dry summits of the Coast Range from Lake county southward. No locality is given for the type, merely "California, Dr. Andrews."

GALIUM SPURIUM L. Sp. Pl. 106. 1753.

Galium Vaillantii DC. Fl. Franc. **4**: 263. 1805.

No. 8625, collected May 31, on Mt. Hamilton, Santa Clara county, elevation 4000 feet, on a northerly slope below the observatory, growing about moss covered stones under oak trees. A strange place for this introduced species, yet we have no described native species to which it can be referred.

VALERIANACEAE Batsch, Tab. Affin. 227. 1802.

PLECTRITIS DAVYANA Jepson, Fl. West. Mid. Cal. 475. 1901.

No. 8526, collected near Smith Creek, Santa Clara county, elevation 2150 feet, growing in clayey ground along the roadside. The flowers in this plant are pinkish, the spur long and prominent. The sides of the fruit are less pubescent than in the type, otherwise the agreement is perfect. Mr. Suksdorf, says it "is very nearly the same as one of the forms that I have mentioned under *Aligera ciliosa*, but if distinct from that the species may be a good one." The type is no. 953 Davy, collected at Antioch, Contra Costa county, and not reported from elsewhere.

PLECTRITIS APHANOPTERA (Gray) Suksd. Deutsch. Bot. Monats.

4: 144. 1897.

Valerianella aphanoptera Gray, Proc. Am. Acad. **19**: 83. 1883.

No. 8483, collected April 27, back of Alum Rock Park, Santa Clara county, in partly shaded places near shrubs in open woods. Mr. Suksdorf, to whom a specimen was sent, says "the

fruit is more glabrous than that of the typical form, but there are several forms as to pubescence." The elevation at this station is 600 feet. The type came from "wet hillsides along the Columbia River, Klikitat Co., Washington Terr., *Suksdorf*." Apparently not heretofore recorded from California, but it was collected somewhere in the State by Bridges, no. 144, a specimen in the herbarium of the University of California.

PLECTRITIS MAGNA (Greene) Suksd. Deutsche Bot. Monats. **4**: 145. 1897.

Valerianella magna Greene, Proc. Phila. Acad. **1895**: 548. 1896.

No. 8466, collected April 25, on the western end of the San Bruno hills, San Mateo county, elevation 500 feet, on northerly slopes in a tangle of other vegetation. The determination is doubtful, as our plant is not stout and tall, neither does it have "rather many small axillary branches." It has the same fruit, however, as a specimen in the herbarium of the University of California, collected by Jepson in Walker canyon, Vacaville, Solano county, May 17, 1892, marked "*V. magna* Greene, acc. to diagnosis." The type came from Knight's valley, Sonoma county.

No. 8544, collected May 18, on Stevens creek near Soda Rock, Santa Clara county, elevation 700 feet, growing sparingly on a northerly slope near shrubs. This too does not have the growth of typical *P. magna*, but is the same as no. 8466.

Plectritis Eichleriana (Suksd.)

Aligera Eichleriana Suksd. Deutsche Bot. Monats. **4**: 147. 1897.

No. 8524, collected May 10, near Smith Creek, Santa Clara county, on the grade leading into Hall's valley, elevation 2200 feet, where it is plentiful on clayey roadside banks. Mr. Suksdorf says "this is almost the same as the type of *Aligera Eichleriana*, but the corolla tube proper is a little shorter here and

the spur a little longer, and possibly the corolla may be a trifle smaller." The type was collected at Antioch, Contra Costa county, in May, 1883, by Mrs. Curran.

PLECTRITIS GLABRA Jepson, Fl. West. Mid. Cal. 475. 1901.

No. 8558, collected May 23, about three miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, elevation 200 feet, on a grassy slope facing northward in damp ground. This has the same shaped fruit as the type, which is not, however, "wholly glabrous," but occasionally is somewhat pubescent on the back as well as on the under side of the beak. The type is Davy 951, collected at Antioch, Contra Costa county, April 7, 1895.

No. 8590, collected May 30, near Smith Creek, Santa Clara county, elevation 2150 feet, in a narrow ravine facing northward in moist ground. This, like no. 8558, has the back of the fruit pubescent, the wings glabrous, but the shape of the fruit is like that of *P. glabra*.

Plectritis nitida

Tall and stout, 6 dm. high or less, the stems as much as 5 mm. in diameter, brownish, smooth and shining, slightly scurfy at the nodes, branched from the base, the branches ascending, the lowermost 3 dm. long: the first two pairs of leaves on margined petioles 4 cm. long, the blades broadly oblanceolate, between 3 and 4 cm. long, the next several pairs oblong, sessile, 3 or 4 cm. long, all obtuse; the uppermost ovate, 1 to 2 cm. long, acute or acutish, sessile: inflorescence terminal, commonly in several approximate whorls, these composed of rather many short branches: calyx lobes linear-attenuate, about 5 mm. long: corollas pinkish, small, 4 mm. long, the small lobes nearly equal, barely 1 mm. long and as wide; spur 1 mm. longer than the corolla tube, stout for the size of the flower: fruit pale yellow-brown, smooth and shining, nearly 2 mm. long, the dorsal side raised and rounded but hardly keeled, not grooved, the ver-

tral cavity open, somewhat elliptical in outline, almost completely filled, slightly pubescent, especially on the short stout beak, the narrow edges or "wings" slightly thickened.

The type, in my herbarium, is no. 8578, collected May 28, 1907, above Crystal Springs, San Mateo county, California, on the Half Moon Bay road, elevation 450 feet, growing in moist ground in a grassy field; abundant. In general appearance this large stout plant must resemble typical *P. magna*, but apparently has a very differently shaped fruit, the wings in that species meeting below, while in this they do not even approach, being very narrow on account of the filled cavity, which is hollow and empty in *magna*.

Plectritis collina

Glabrous annual: stems simple, 2 dm. high, pale: leaves in about four pairs, the basal ones with slender margined petioles 6 or 7 mm. long, the blade nearly orbicular, between 2 and 3 mm. across, the stem leaves sessile, oblong or oblong-lanceolate, blunt or acutish, 1 to 1.5 cm. long, 5 mm or less wide: whorls of flowers five or less: calyx linear-attenuate, about 5 mm. long: corollas white, nearly 4 mm. long, regular, 2 mm. across the open top, the oblong rounded lobes 1 mm. long, spur very short and inconspicuous: stamens salmon color, as long as the tube: style exerted nearly 2 mm. from the corolla, the 3-lobed stigma large in proportion: fruit glabrous and smooth on the back, either whitish or pale slate-color, somewhat clavate in shape, a little less than 2 mm. long, and half as wide as long, the dorsal side rounded, grooved, but not keeled, ventral cavity completely filled, a slight pubescent line running lengthwise in the middle, edges of the wings turned in and covering about two-thirds of the ventral surface, irregular in outline, the space between them wider at top and bottom than in the middle, where it is slightly contracted by the widening of the wings.

The type, in my herbarium, is no. 8609, collected May 31, 1907, on Mt. Hamilton, Santa Clara county, California, on the westerly slope of Copernicus Peak, elevation 4300 feet, in damp grassy places. Its nearest relative is perhaps *P. aphanoptera*. Mr. Suksdorf, who has examined a specimen, reports that it is unknown to him.

CICHORIACEAE Reichb. Fl. Exc. 248. 1831.

AGOSERIS APARGIOIDES (Less.) Greene, Pittonia **2**: 177. 1891.

Troximon apargioides Less. Linnaea **6**: 501. 1831.

No. 8458, collected April 25, along the base of the San Bruno hills near Colma, San Mateo county, elevation 400 feet, in sandy ground, and common, as it is along the coast from San Francisco to Monterey. San Francisco is the type locality.

MICROSERIS CONJUGENS Greene, Pittonia **5**: 7. 1902.

No. 8537, collected May 30, in Hall's valley, Santa Clara county, elevation 1500 feet, in a grassy field, only one patch noticed. In some respects this agrees with *M. melanocarpha*, as it has almost subglobose heads, the achenes broadest at summit, the outer ones villous, but the paleae are paler, narrowed above. Some of the heads appear to be destitute of pappus. The type was collected at Byron Springs, Contra Costa county.

GRINDELIACEAE Reichb. Consp. 107. 1828.

(*Asteraceae* Lindl. Nat. Syst. Ed. 2, 251, 253. 1836.

BACCHARIS VIMINEA DC. Prodr. **5**: 400. 1836.

No. 8510, collected May 7, on the banks of Los Gatos creek near Campbell, Santa Clara county, elevation 200 feet. A comparatively common shrub on stream banks, usually in gravelly bottoms from Butte county southward, the branches slender and wand-like. Greene apparently considers this the same as *B. glutinosa*.

CORETHROGYNE CALIFORNICA DC. Prodr. **5**: 215. 1836.

Corethrogyne caespitosa Greene, Fl. Fran. 378. 1897.

No 8576, collected May 28, above Crystal Springs, San Mateo county, near the Half Moon Bay road, elevation 425 feet, on an open grassy slope. This is from the type locality of *C. caespitosa*, and seems to be the only known station for the plant. This species has been misunderstood by all except Greene in his Manual, 178, and Jepson in his Flora, 565, since the time of Torrey and Gray's Flora. I am informed by Professor Jepson that he has seen the type, and that *C. caespitosa* is identical. The plant grows in dense tufts, the stems four to eight inches long, slightly woody at the very base, prostrate or decumbent, the large violet-purple heads solitary on scape-like peduncles.

ERIGERON GLAUCUS Ker, Bot. Reg. **1**: pl. 10. 1815.

Aster Californicus Less. Linnaea **6**: 121. 1826.

No. 8455, collected in San Mateo county on the sea shore where the Ocean Shore railroad appears on the coast, growing in sand. It is a strictly maritime species, always found within reach of the salt spray. The original was thought to have come from Buenos Ayres.

GRINDELIA HIRSUTULA H. & A. Bot. Beech. 147. 1833.

Grindelia rubricaulis DC. Prodr. **5**: 316. 1836.

No. 8575, collected May 28, above Crystal Springs, San Mateo county, on the Half Moon Bay road, elevation 425 feet, in grassy fields. The determination is by no means certain, as the genus is badly in need of revision. Some of the achenes have four pappus awns, and perhaps that is the normal number, as they break off readily.

PENTACHAETA APHANTOCHAETA Greene, Bot. Gaz. **8**: 256. 1883.

Aphantochaeta exilis Gray, Pac. R. R. Rep. **4**: 99. pl. 11 A. 1857; not *Pentachaeta exilis* Gray, Bot. Cal. **1**: 305.

No. 8594, collected May 30, at Smith Creek, Santa Clara county, elevation 2150 feet, on a grassy slope in dry ground near

thickets. Some of the plants exhibit achenes just like the ones figured in the Pacific Railway Report, while others have five slender awns as long as the achene itself. There are no ray flowers. The type was collected by Bigelow on "hill-sides in the Napa Valley, California; April 25." The name *exilis* was first applied to this plant, but must give way to the later one of Greene on account of the *Pentachaeta exilis* Gray.

GNAPHALIACEAE Greene, Fl. Franc. 358. 1897.

GNAPHALODES-CALIFORNICA (F. & M.) Greene

No. 8595, collected May 30, at Smith Creek, Santa Clara county, elevation 2150 feet, on dry grassy slopes about thickets. Its usual habitat is grassy slopes in gravelly soil.

PARTHENIACEAE Link, Handb. 1: 816. 1829.

(*Helianthaceae* Pfeiff. Nomencl. Bot. 1: 1579. 1874.)

HELIANTHELLA CALIFORNICA Gray, Pac. R. R. Rep. 4: 103.
1857.

No. 8522, collected May 10, near Smith Creek, Santa Clara county, elevation 2200 feet, on a thinly wooded slope growing about oak and pine trees and undershrubs, just coming into flower. The type was collected by Bigelow in "Napa Valley, California, on hillsides; April." Greene reported it from Mt. Hamilton in *Erythea* 1: 90. 1893, but in Fl. Fran. 410. 1897, mentions it from as far south only as Contra Costa county, as does Jepson also in his Flora.

MADIACEAE Greene, Fl. Fran. 356. 1897.

HARPAECARPUS EXIGUUS (Smith) Gray

No. 8593, collected May 30, at Smith Creek, Santa Clara county, in dry ground on the edge of a thicket, the plants small, six inches or less. An exceedingly variable plant as to size, ranging from an inch or two in thin gravelly soil to nearly two feet in rich loose soil. It is commonly found on the borders of woods or thickets.

BLEPHARIPAPPUS NEMOROSUS Greene, Manual 200. 1894.

No. 8556, collected May 23, about three miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, elevation 200 feet, on an open grassy bank, not very plentiful. The given range is Mt. Tamalpais, Mt. Diablo, and the Berkeley hills. Jepson does not record any additional stations, so ours is a considerable extension of the range.

HELENACEAE fam. nov.

Perennial herbs, or in a few cases suffruticose, sometimes dotted with oil glands: leaves either entire or pinnately parted or pinnatifid, especially the lower ones: bracts of the involucre herbaceous or membranaceous, sometimes petal-like and colored their margins and apices then scarious: receptacle destitute of bracts, rarely with bristle-like chaff: rays present sometimes persistent and papery, or wanting in some genera; disk flowers with regular 4 to 5-toothed tubular corollas: pappus paleaceous or aristiform, or sometimes rigid and bristly, rarely none. A family confined chiefly to western America, some of the genera local. It is composed of the genera which are included by most writers in the tribe Helenioideae or Helenieae of the family called Compositae.

BAERIA CHRYSOSTOMA F. & M.

No. 8465, collected April 25, on the western end of the San Bruno hills, San Mateo county, elevation 500 feet, growing in a tangled mass of other plants. Some of the flower heads are very large, an inch across, which is two or three times the ordinary size. It ranges from at least Sonoma county south to Kern county in the Coast Range, often covering grassy slopes with yellow.

CHAENACTIS LANOSA DC.

No. 8603, collected May 31, on Mt. Hamilton, Santa Clara county, at Aquarius, Spring, elevation 3850 feet, on a steep gravelly slope. Greene reports it from Mt. Hamilton in *Erythra* 1: 91. 1893, but Jepson, eight years later in his *Flora* says "not seen within our limits."

ERIOPHYLLUM ARACHNOIDEUM (F. & L.) Greene

No. 8584, collected May 28, about two miles beyond San Mateo, San Mateo county, on the Half Moon Bay road, elevation 100 feet, on a grassy sparsely wooded slope, and not uncommon in the vicinity. It is a much thinner leaved more erect plant than is my idea of this species, and the disk corollas do not have a "very glandular-hirsute tube" as described by Greene, but are granular.

LASTHENIA GLABRATA DC. in Lindl. Bot. Reg. *pl.* 1780. 1835.

No. 8598, collected May 30, in Hall's valley, Santa Clara county, elevation 1500 feet, growing in rich damp soil in low ground, and abundant at one place near the Mt. Hamilton road. The leaves are all narrow, entire, the lowest dilated and connate at base, the uppermost little if any dilated, meeting but not connate.

ANTHEMIDACEAE fam. nov.

Annuals, or perennial herbs, or shrubs, mostly aromatic scented, with bitter juice: leaves usually much dissected: involucre bracts imbricated, more or less scarious: ray flowers either present or wanting: receptacle either naked or chaffy: anthers not caudate: style branches of perfect flowers truncate, sometimes penicillate: achenes small and short, the pappus a circle of small scales, or wanting. A family composed of the genera included under the tribe or subfamily Anthemideae of the family called Compositae.

ACHILLEA LANULOSA Nutt. Journ. Phila. Acad. 7: 36. 1834.

No. 8589, collected May 30, near Smith Creek, Santa Clara county, elevation 2150 feet, on grassy slopes about thickets in gravelly ground. The type was collected by Wyeth in the Rocky mountains, and it is doubtful whether our plant is the same, since several forms are found in the State.

SENECIONACEAE fam. nov.

Mostly perennial herbs, some shrubby; juice watery, some bitter and aromatic: leaves mostly alternate, entire or merely toothed, sometimes dissected: involucre mostly cylindrical, the bracts herbaceous, not scarious, in one or two series, sometimes with short accessory ones at base: receptacle naked: anthers not caudate at base but sometimes sagittate: style branches of perfect flowers obtuse or truncate, or sometimes penicillate: pappus of numerous capillary bristles, commonly fine and scabrous but sometimes coarser and barbellulate, occasionally caducous. A family made up of the genera comprising the tribe Senecionideae or Senecioneae of the family called Compositae.

ARNICA CORDIFOLIA Hook. Fl. Bor. Am. **1**: 331. 1833.

No. 8612, collected May 31, on Mt. Hamilton, Santa Clara county, on the ridge between the observatory and Copernicus Peak, elevation 4225 feet, in loose gravelly ground under bushes. These plants are rayless, and no doubt are identical with the plant reported from here in the Botany of California, collected by Brewer. I do not believe my plant is of this species, but refer it here temporarily.

SENECIO ARONICOIDES DC. Prodr. **6**: 426. 1837.

No. 8448, collected April 20, in San Mateo county near Lake Merced, elevation 100 feet, on damp northerly slopes in a rank growth of other plants. This seems to be the typical form with unequally dentate leaves. Douglas collected the type, perhaps in this same region.

SENECIO EURYCEPHALUS T. & G. Mem. Am. Acad. II. **4**: 109. 1849.

Senecio Breweri Davy, Erythea **3**: 116. 1895.

No 8565, collected May 23, about two miles beyond San Mateo, San Mateo county, elevation 100 feet, on the Half Moon Bay road, growing in shade on a wooded northerly slope in rich loose ground. Fremont collected the original in this State, but the station not given.

CARDUACEAE Neck. Act. Ac. Theod. Palat. **2**: 465. 1770.

CARDUS EDULIS (Nutt.) Greene, Proc. Phila. Acad. **1892**: 362.

1893.

Cirsium edule Nutt. Trans. Am. Phil. Soc. **7**: 420. 1841.

Cnicus edulis Gray, Proc. Am. Acad. **10**: 47. 1874.

No. 8542, collected May 18, on Stevén's creek, Santa Clara county, about three miles below Soda Rock, elevation 600 feet, growing on a moist bank in a luxuriant growth of other plants. The type was collected by Nuttall on "plains of Oregon and the Blue Mountains." I have found it as far south as Monterey.

SUMMARY

In the first part of this paper a comparison of the floras of the outer and middle Coast Ranges in Santa Clara county was promised. The data are based upon the species mentioned in this paper, species which have been collected by me during the past three years, and specimens of which are now in my herbarium.

Although the Santa Clara valley, which separates the two mountain ranges, is not over fifteen miles wide between Los Gatos on the west and Alum Rock Park back of San Jose on the east, there is considerable difference in the annual precipitation, probably as much as ten inches in favor of the west side. This ratio should hold as one ascends the mountains, but if there is any difference the proportionate precipitation is greater on the summit of the Santa Cruz mountains than on Mt. Hamilton, which is about 500 feet higher than the highest peak in the Santa Cruz mountains.

SPECIES COMMON TO THE SANTA CRUZ MOUNTAINS AND THE MT. HAMILTON RANGE

<i>Dichelostemma congestum</i>	<i>Limnia perfoliata</i>
<i>Triteleia laxa</i>	<i>Clematis lasiantha</i>
<i>Calochortus albus</i>	<i>Delphinium patens</i>
<i>luteus</i>	<i>Eschscholtzia crocea</i>
<i>venustus</i>	<i>Drymocallis glandulosa</i>

Lathyrus puberulus	Nemophila Kelloggii
Lupinus albifrons	Phacelia nemoralis
carnosulus	Amsinckia parviflora
formosus	Cryptanthe pumila
latifolius	Pogogyne serpylloides
Trifolium aciculare	Scutellaria tuberosa
Hallii	Castilleja Douglasii
Acer macrophyllum	Collinsia bicolor
Viola pedunculata	Mimulus arvensis
Sanicula Menziesii	nasutus
Washingtonia brevipes	Pentstemon heterophyllus
Gilia achillefolia	Scrophularia floribunda
Nemophila aurita	Gnaphalodes californica
insignis	Harpaecarphus exiguus

SPECIES FOUND ONLY IN THE SANTA CRUZ MOUNTAINS

Tumion californicum	Trifolium virescens
Bromus Pumpellianus	Ceanothus papillosus
Festuca subuliflora	Rhamnus californica
Melica imperfecta	Viola ocellata
Phalaris amethystina	Godetia tenella
Lemmoni	Cornus californica
Carex bifida	Dodecatheon cruciatum
Juncoides comosum	Hendersoni
Dichelostemma capitatum	Convolvulus subacaulis
Trillium ovatum	Gilia multicaulis
Piperia Cooperi	Nemophila liniflora
Salix laevigata	Phacelia divaricata
Pterostegia drymarioides	Cynoglossum grande
Heuchera micrantha	Orthocarpus densiflorus
Therofon circinnatum	pusillus
Trifolium ciliolatum	Carduus edulis
microcephalum	

SPECIES FOUND ONLY IN THE MT. HAMILTON RANGE

Selaginella Bigelovii	Limnanthes Douglasii
Allium Breweri	Viola purpurea
lacunosum	Acrolasia aurea
Iris californica	Gomphocarpus tomentosus
Chorizanthe membranacea	Gilia gilioides
Limnia gypsophiloides	Dactylophyllum ambiguum
nubigena	Eucrypta chrysanthemifolia
Cerastium viride	Hydrophyllum occidentale
Moehringia macrophylla	Phacelia Breweri
Delphinium apiculatum	leptostachya
nudicaule	Acanthomintha lanceolata
recurvatum	Collinsia sparsiflora
Arabis Breweri	Orthocarpus purpurascens
Cardamine oligosperma	Scrophularia californica
Cheiranthus californicus	Tonella tenella
Euclisia Mildredae	Galium Andrewsii
Guillenia lasiophylla	spurium
Lithophragma affinis	Plectritis aphanoptera
heterophylla	collina
Amelanchier gracilis	Davyana
Padus demissa	Eichleriana
Lathyrus quercetorum	glabra
Lupinus collinus	Microseris conjugens
microcarpus	Pentachaeta aphantochaeta
Pendletoni	Helianthella californica
Thermopsis californica	Chaenactis lanosa
Trifolium petrophilum	Lasthenia glabrata
variegatum	Achillea lanulosa
Wormskjoldii	Arnica cordifolia

II.—PLUMAS COUNTY AND NEVADA

Through the kindness of Professor P. B. Kennedy, of the University of Nevada, it was made possible for me to spend three weeks along the eastern base of the Sierra Nevada, chiefly in Plumas county.

Two collections were made in the vicinity of Reno, Nevada, one on the hills about a mile north of the city, the other some seven or eight miles east at Truckee Pass, where the Truckee river cuts through the Virginia mountains. At the latter place some very interesting plants were found, such as *Lupinus brevicaulis*, *Eschscholtzia minutiflora*, and *Sphaerostigma tortuosum*, all from type locality. My *Eriogonum maculatum*, described from specimens collected many miles to the south in Inyo county California, was also found here, as well as a shrubby species of the same genus, as yet undetermined. In a meadow near Sparks was found *Bolelia laeta*, hitherto known only from the type locality, in eastern Nevada.

Early in the morning of July 1st we started from Reno with a stout team and wagon loaded with the necessary camp outfit and material for drying plants. The road leads north for about ten miles, then turns northwestward past Anderson's ranch at the foot of Peavine mountain. This northwesterly course was kept for the balance of the day, and for the whole trip, for that matter.

California was entered about noon near Purdy, Sierra county, a station on the Nevada, California and Oregon railroad. During the afternoon we passed through a corner of Lassen county, and late in the day crossed Beckwith Pass, the lowest pass in the Sierras, the elevation only 5300 feet, into Sierra valley in Plumas county, and the remainder of the distance traveled on the outward trip, nearly 100 miles, was entirely within the borders of this county.

Sierra valley is quite flat, the average elevation being 4900 feet. Its breadth from east to west is about fifteen miles, and its length about twenty. Much of its surface is made up of na-

tive hay meadows, encroached upon near the borders by tongues of sandy sage brush land which reach down from the surrounding ridges. Sugar Loaf Butte rises abruptly out of the valley several miles east of Beckwith, its elevation above the valley 300 or 400 feet, and in this neighborhood is an extensive stretch of sand and sage brush.

The second day's journey took us across Sierra valley to Beckwith, then northward along the road skirting the hills for about three miles to where the road enters the mountains, crossing over a divide at an elevation of 6000 feet into Red Clover valley, twelve miles distant from Beckwith.

Three full days were spent in Red Clover valley, which has a general east and west trend, its length ten or twelve miles, varying in width from one to about five miles, the average elevation 5500 feet. Our camp was situated toward the eastern end of the valley, and the valley itself was explored as well as the near-by low ridges. The highest point reached was a ridge lying parallel to the valley on the north side, the elevation 6500 feet. The flora there being practically the same as that of the low ridges near camp, no further attempt was made to reach other high points.

The make-up of the valley is somewhat like that of Sierra valley, native grasses and other moisture loving plants occupying the lower parts, while the more elevated ground along the edges is covered with sage brush and numerous other plants affecting such situations.

The prevailing formation is andesite, with an occasional outcrop of volcanic rock.

One of the chief plants of the meadows is a form of the species listed as *Trifolium longipes*. From this plant the valley perhaps takes its name, although the flower heads are more pale than red. But it may be that *Trifolium Beckwithii* is responsible for the name, for a meadow at the Red Clover House at the extreme western end of the valley, supports a quantity of the latter species, the large heads dull crimson.

Owing to the length of time that has elapsed since the few preliminary remarks on the Plumas county collection of 1907 were printed, I have decided to discontinue the account.

An annotated list of the plants collected in Big Meadows about Prattville would probably be of some interest, for that place is now inundated. The Great Western Power Company has converted Big Meadows into an immense reservoir since our visit. The numerous large springs which welled up in the meadows furnished an abundance of moisture for a luxuriant growth of many species of plants in addition to the covering of native grasses. It was the type locality for several species.

TWO NEW COMPOSITAE FROM NEVADA

BY HARVEY MONROE HALL

Chrysothamnus gramineus sp. nov.

Et radice perenne multicaulis: caulibus erectis, ca. 30 cm. altis, glabris, striatis, basi frutescentibus, usque ad apicem foliosis: foliis alternis, sessilibus, lanceolatis, acuminatis, 4-6.5 cm. longis, 0.5-10 mm. latis, e basi 3-5-nerviis, glabris; margine integris, scabris: capitulis paucis, laxe racemosis, 1-2-bracteatis, bracteis angustis acutis quam involucri brevioribus; pedunculis 0.5-8 cm. longis, ad axillas foliorum oriundis: involucrio cylindraceo, ca. 11 mm. longo, 4-5 mm. lato; squamis valde imbricatis, circa 3-seriatis, oblongis, obtusissimis, chartaceis; exterioribus mucronatis, ciliatis, apice viridiscens: floribus 4 vel 5; consimilibus: corolla glabra, tenui, infundibuliformi, ca. 12 mm. longa; dentibus 5, ovatis, acutis: antheris basi minute auriculatis, apice attenuatis: styli ramis acutis, longe exsertis: acheniis fere exacte cylindraceis, 10-striatis, glabris: pappi setis sordidis, corollae aequilongis.

Stems many from the perennial woody base, stiffly erect, leafy to the summit, 30 cm. high, striate and glabrous, simple below, producing 1 to 6 branches above; each branch or peduncle .5 to 8 cm. long, erect or ascending and bearing a single terminal head: leaves alternate, sessile, lanceolate, acuminate, 4 to 6.5 cm. long, .5 to 10 mm. broad, entire, with 3 to 5 parallel veins and remote cross-veins (especially prominent beneath), glabrous, sometimes sprinkled with white granules; margins scabrous: heads rather scattered, forming a loose raceme, each subtended by 1 or 2 narrow acute bracts shorter than the involucre: involucre cylindrical, 11 mm. high, 4 or 5 mm. broad; bracts well imbricated in about 3 series, not in vertical ranks, chartaceous and nearly white, oblong, very obtuse; outer ones slenderly mucronate, ciliate, greenish towards the summit: flowers 4 or 5, all alike: corolla glabrous, narrow-funnelform, 12 mm. long, acutely 5-toothed: anthers acutely and minutely auricled at base, attenuate at apex: style branches acute, long-exserted: akenes nearly terete, 10-ribbed, glabrous: pappus brownish, as long as the corolla.

Lee canyon, Charleston mountains, Clark county, Nevada, in limestone at the sawmill, altitude 2450 m., August 4, 1913, A. A. Heller. Type in the herbarium of the University of California. Merotype in the herbarium of A. A. Heller.

This species is related to *C. Vaseyi* (Gray) Greene, which it resembles in the involucre and akene characters, but it is decidedly different in its long acuminate leaves, larger scattered heads, short corolla-lobes, etc. The foliage is strikingly like that of certain forms of *Solidago pumila* (Nutt.) T. & G., and the habit is similar up to the inflorescence; but the floral structure is very different from that of any *Solidago*.

Tanacetum compactum sp. nov.

Perenne, caespitosum, undique incano-sericeum, 2-4 cm. altum: foliis inferioribus 5-15 mm. longis, pinnati-partitis; segmentis 4-9, congestis, elliptico-oblongis, obtusis, 2-5 mm. longis, integris vel 3-lobatis; petiolo plano; foliis superioribus sparsis, plerumque pinnati-partitis interdum integris: capitulis solitariis, hemisphaericis, ca. 8 mm. latis, ca. 5 mm. altis: involucri squamis imbricatis, subaequalibus, oblongis, obtusis, crassis, marginibus hyalinis: receptaculo conico, glabro: floribus radii paucissimis, filiformibus, foemineis; corolla minute 3-dentata, glabra: floribus disci numerosis, hermaphroditis; corolla cylindracea, ca. 3 mm. longa, 5-dentata, dentibus brevissimis extus pilosis: antheris acutis: achaeniis (immaturis) laevis, oblongis, truncatis: pappo nullo.

Perennial, densely caespitose, whole plant silvery-sericeous; flowering stems 2 to 4 cm. high: lower leaves 15 mm. and less long, pinnately parted; petiole flat; lobes 4 to 9, crowded, elliptic-oblong, obtuse, 2 to 5 mm. long, sometimes lobed; upper leaves scattered, with few lobes or entire: heads solitary, terminating the simple erect stems; involucre broad-hemispheric, 8 mm. broad, 5 mm. high; bracts imbricated, nearly equal, oblong, obtuse, the middle portion thick and rigid, margins scarious and tinged with pink: receptacle conic, glabrous: corolla of the few female flowers filiform, irregularly and minutely 3-toothed, glabrous; corolla of hermaphrodite flowers cylindric,

3 mm. long, minutely 5-toothed, the teeth pilose externally: anthers acute: akenes (immature) utricular, oblong, truncate, not evidently nerved: pappus none.

Head of Lee canyon, Charleston mountains, Clark county, Nevada, altitude 3300 m., August 15, 1913, *A. A. Heller 11075*. Type in the herbarium of the University of California. Topotype in the herbarium of A. A. Heller.

In habit and pubescence this species resembles *T. potentilloides* Gra., but differs in important technical characters, especially in its non-hirsute receptacle and in the narrow corollas of the hermaphrodite flowers, the teeth of which are much smaller and densely pubescent. In floral structure it is more like *T. diversifolium* D. C. Eaton, but the inflorescence, involucre, foliage and pubescence are all very different. It belongs to Nuttall's genus *Sphaeromeria*, reduced by Torrey & Gray to *Tanacetum*.

University of California, Berkeley, California..

A LIST OF OREGON PLANTS NOT MENTIONED
IN THE LOCAL MANUALS

By J. C. NELSON

In the course of a somewhat desultory attempt to become familiar with the flora of the Wilamette valley and adjacent sections of western Oregon during the past season, I have been surprised to find how many plants occur that are not listed in the local manuals—Howell's Flora of Northwest America; Piper's Flora of Washington; Frye & Riggs Northwest Flora. The great majority of these are introduced species, and in some cases are not yet fully established; but the conditions for plant growth are very favorable in this region, and it seems reasonable to expect that most of the plants listed below will become permanent additions to the flora of Oregon.

In the determination of these species I have in very few cases trusted to my own unaided judgment. I am indebted for the determination of the sedges to Mr. Kenneth K. Mackenzie of New York City; for the grasses to Professor A. S. Hitchcock and Mrs. Agnes Chase of the Bureau of Plant Industry, Washington, D. C., and for the ballast plants to Messrs. J. E. Macbride and F. J. Smiley of the Gray Herbarium of Harvard University, to all of whom I take this occasion of expressing my sincere thanks. I also express my obligation to Professor A. R. Sweetser of the University of Oregon, and Miss Ethel Sanborn Curator of the University herbarium, for the privilege of consulting the very complete collection of Oregon plants deposited in the herbarium at Eugene, and for many valuable suggestions in regard to doubtful or difficult species. Specimens of all "first appearances" have been deposited either in the Gray Herbarium or in the National Herbarium at Washington.

1 PASPALUM DILATATUM Poir. On sand ballast, Linnton.

2 PANICUM BARBINODE Trin. With the last. Not in flower on October 9th, but easily recognized by its long stolons and strongly bearded nodes.

3 *CHAETOCHELOA ITALICA* (L.) Scribn. Well established in a ditch beside the railroad track just west of the Southern Pacific station at Eugene.

4 *STIPA LITTORALIS* Philippi. On ballast, Linnton. This seems not to have been reported anywhere since its discovery at Quiriquina, Chili. There is but one specimen in the National Herbarium, in the handwriting of Philippi himself.

5 *NASSELLA CHILENSIS* Desv. A South American grass apparently not previously reported from the United States.

6 *AMMOPHILA ARENARIA* Link. On ballast, Linnton.

7 *APERA SPICA-VENTI* Beauv. A single specimen in rather dilapidated condition was found on a lawn in Salem. Mr. W. N. Suksdorf has collected it at Linnton.

8 *ERAGROSTIS CYPEROIDES* Beauv. This strange south African grass is well established on ballast at Linnton, but seems to have never before been reported from the United States.

9 *ERAGROSTIS ORCUTTIANA* Vasey. This species from the southwest was associated with maritime grasses at Linnton, although not heretofore reported from coastal regions.

10 *CYNOSURUS CRISTATUS* L. Not infrequent on lawns at Salem and Eugene.

11 *CHLORIS RADIATA* Sw. Another South American species that seems to have heretofore escaped notice in the United States. On ballast, Linnton.

12 *LOLIUM PERENNE CRISTATUM* Doell. A single specimen was collected in a wooded ravine near Eola, Polk county. This seems to be the first appearance in the United States of this European grass. Collectors should be on the lookout for it elsewhere.

13 *LOLIUM MULTIFLORUM* Lam. Very abundant in all parts of the Willamette valley which I have visited, but seems to have been confused with *L. perenne* L. with which it is invariably associated.

14 *AGROPYRON CAESIUM* Presl. This European species was found well established in dry soil about the lighthouse on Yaquina Head. Not previously reported from the United States.

15 *AGROPYRON JUNCEUM* Beauv. On ballast, Linnton.

16 *AGROPYRON GLAUCUM* R. & S. With no. 15, and both well established.

17 *CYPERUS FEROX* Vahl. On ballast, Linnton, associated with nos. 1 and 2 above.

18 *CAREX HALLII* Bailey. Growing among rocks at the water's edge on the McKenzie river at Hendricks. Also along the shore of the Willamette at Salem.

19 *CAREX LEPTOPODA* Mackenzie. In a damp thicket on the bank of the McKenzie at Dedman's ferry, east of Eugene.

20 *CAREX SUBFUSCA* W. Boott. In a dry pasture on the mountain side near Coburg.

21 *CAREX SPECIFICA BREVIFRUCTUS* Kukenthal. In swampy ground along Silver creek near Silverton.

22 *ROUBIEVA MULTIFIDA* Moq. On ballast, Linnton.

23 *CHENOPODIUM AMBROSIOIDES* L. With no. 22, and closely resembling it. Also on gravel bars in the Willamette at Salem.

24 *CHENOPODIUM GLAUCUM* L. On a sand bar in the Columbia river opposite Vancouver, Wash.

25 *AMARANTHUS GRACILIS* Desf. On ballast, Linnton. A tropical American species.

26 *IBERIS CORONARIA* Don. In dry soil on Skinner's Butte, Eugene.

27 *LUNARIA ANNUA* L. In alluvial soil along Mill creek just east of Salem.

28 *LEPIDIUM GRAMINIFOLIUM* L. On ballast, Linnton. Species somewhat doubtful, and further study is needed.

29 *LEPIDIUM DRABA* L. On ballast, Linnton.

30 LEPITIUM DRABA CHALEPENSE Thellung. Associated with the last, but plainly distinct.

31 CRAMBE MARTIMA L. On the beach at the base of the cliffs on Yaquina Head.

32 BRASSICA INCANA F. W. Schultz. On ballast, Linnton.

33 DILOTAXIS TENUIFOLIA DC. Closely associated with the last, which it much resembles.

34 RESEDA LUTEOLA L. On ballast, Linnton.

35 RESEDA ALBA L. On ballast, Linnton; also in vacant lots at Salem.

36 MIMOSA ASPERATA L. On ballast, Linnton; not in flower. This Mexican species seems not to have been reported from the United States before.

37 LUPINUS FISSICALYX Heller. On the gravelly shore of the Santiam river opposite Jefferson. I am indebted to Mr. A. A. Heller for the determination of this very interesting species.

38 LUPINUS COLUMBIANUS Heller. Not infrequent along the Southern Pacific right of way between Salem and Chemana.

39 VICIA VILLOSA Roth. Becoming abundant along fence rows and railroad embankments. Evidently introduced as a cover crop in orchards.

40 LATHYRUS LATIFOLIUS L. Common on vacant lots in Salem and observed also at Eugene and Albany.

41 CORCHORUS PILILOBUS Link. On ballast, Linnton. Found only in fruit. The first representative of Tiliaceae reported from Oregon.

42 MALVA SYLVESTRIS L. Thoroughly established along streets and in vacant lots at Salem.

43 MODIOLA MULTIFIDA Moench. On ballast, Linnton. Somewhat doubtful, as neither flowers nor fruit were found.

44 TETRAGONIA EXPANSA Murr. On ballast, Linnton. This with the two following are the first representatives of Ficoidae to be recorded from the state.

- 45 MESEMBRYANTHEMUM CRYSTALLINUM L. The species somewhat doubtful; not in flower.
- 46 MESEMBRYANTHEMUM NODIFLORUM Haw. With the last.
- 47 CONIUM MACULATUM L. Very common in waste ground and along streets at Eugene.
- 48 FOENICULUM VULGARE Hill. Abundant in vacant lots at Salem; also observed at Eugene.
- 49 BORAGO OFFICINALIS L. Well established on street parkings, Eugene.
- 50 MYOSOTIS VERSICOLOR Sm. A single specimen from the railroad yards at Salem.
- 51 MENTHA ARVENSIS L. Common in pastures and on roadsides along the valley of Mohawk creek, above Hendricks.
- 52 MENTHA ROTUNDIFOLIA Huds. On the border of a cultivated field on the Willamette between Eugene and Springfield.
- 53 SOLANUM NIGRUM DOUGLASII (Dunal) Gray. On ballast, Linnton.
- 54 DATURA QUERCIFOLIA H. B. K. On ballast, Linnton. This may prove to be *D. villosa* Fernald, as the fruit only was found. A west Mexican species.
- 55 NICOTIANA RUSTICA L. Well established on ballast, Linnton.
- 56 SHERARDIA ARVENSIS L. Common on lawns, Salem and Eugene.
- 57 GALIUM PARIENSE L. Dry roadside at the base of Spencer's Butte, seven miles south of Eugene.
- 58 GALIUM TRICORNE Stokes. Reclining on bushes in a thicket in the southern suburbs of Eugene.
- 59 AMBROSIA TENUIFOLIA Spreng. On ballast, Linnton. A tropical species.

60 *SENECIO VISCOSUS* L. On ballast, Linnton.

61 *SENECIO SYLVATICUS* L. Along the new railroad from Eugene to the coast. Very common about Walton; also observed along sandy roadsides at Newport.

62 *SENECIO JACOBAEA* L. On ballast, Linnton.

63 *CARDUUS NUTANS* L. Well established on ballast, Linnton.

The ballast heaps at Linnton are still far from exhausted. Several plants were collected there which on account of immature or imperfect specimens could not be satisfactorily determined. A very evident species of *Desmodium*, a genus not previously reported from Oregon, was collected, showing neither flowers nor fruit. A prickly Composite of the tribe Cynareae, with yellow flowers, baffled all attempts, but was provisionally referred by Mr. Macbride to *Cousinia*. Another unknown Composite of the tribe Anthemaeae seemed very near to *Cotula*. Still another had the aspect of a stemless *Senecio*, but could not be determined on account of the imperfect condition of the specimen. It is hoped that collectors will devote more attention to this very interesting station. Additions are constantly being made, and some of them seem in a fair way to become permanent residents of the state. A careful study of the introduced plants of Oregon would be of distinct value to students of our northwestern flora.

Salem, Oregon.

LIST OF PLANTS IN THE VICINITY OF
PORTLAND, OREGON

BY M. W. GORMAN

In compiling the following preliminary list of the plants of Portland, my object is twofold, viz.: first, as a basis of comparison with the vegetation as known here thirty years ago, and second, as a record for the use of future students and botanists who may wish to know what our local flora consisted of at the present time. That considerable changes and additions have taken place within the past twenty-five or thirty years is clearly evidenced by the fact that of the present list of 835 plants, 95 species, exclusive of the cryptogams, were not included in Howell's Flora, issued March 15, 1897, to August 10, 1903, and that of the plants which were included therein, a few additional species were not then known to occur in the vicinity of Portland.

The plants herein included are such as can be found within the present city limits or in close proximity thereto and readily accessible by one or other of the various suburban car lines. It is quite probable that say 50 additional species, chiefly amongst the grasses and sedges (with which I am not familiar), could be found within the area included. The locality of a few plants is given as Multnomah Falls, not because they cannot be found nearer this city, but for the reason that the specimen in hand was collected there. Many indigenous species which formerly occurred on Mt. Tabor (now Mt. Tabor Park) cannot at present be found nearer than Mt. Scott, and some species such as *Clintonia uniflora*, *Cytherea bulbosa*, *Cimicifuga elata* and *Cynoglossum grande*, which twenty years ago were not uncommon in Macleay Park, have now to be collected much further afield.

A few species have disappeared within the last thirty years, while many introduced species and ballast waifs have put in an appearance during the same period. Most of the two latter classes soon become established owing to our mild balmy climate and ample rainfall, the majority as common weeds, a few as more or less ornamental plants, a small minority as veritable farm pests, while a still smaller number disappear after a year or two, probably owing to failure in finding a congenial habitat.

In Proceedings Indiana Academy of Sciences, 1893, pp. 258-262, Dr. R. Hessler gives a list of 35 new plants that had made their appearance along railroads and waste places in Fayette county, that state, during the 7 years from 1883 to 1890, of which only 9 species (say 25 per cent.) were able to maintain themselves permanently.

In our region, with its rich soil and equable weather conditions, it is safe to say that 80 to 90 per cent. of these would have become naturalized in that time.

The 35 species mentioned consist of 18 European weeds, 1 South American weed, and 16 native North American plants with more or less weedy tendencies. Of these 35 species, 19 have not yet been found in Oregon. Among the 16 species which do occur here, 5, *Arenaria serpyllifolia*, *Camelina sativa*, *Medicago lupulina*, *Melilotus alba* and *Melilotus officinalis* are common European weeds; 7, *Saponaria Vaccaria*, *Hypericum perforatum*, *Conium maculatum*, *Plantago lanceolata*, *Chrysanthemum leucanthemum*, *Carduus arvensis* and *Lactuca Scariola* are troublesome European weeds; 2, *Verbena stricta* and *V. bracteosa* are native weeds; 1, *Geranium carolinianum*, is a common North American weed; and 1, *Melissa officinalis*, is a harmless garden escape. All 16 are well established, and not one shows any tendency to decrease in numbers or disappear.

In response to the expressed wish of some teachers and plant lovers, the common names, and in most instances, the color and period of flowering have been given.

From the same source an earnest appeal has been made to the writer to say a word for the protection of our beautiful wild flowers. In view of the wanton destruction and vandalism which botanists and all real lovers of flowers are compelled to witness every spring in the vicinity of all American cities, the utility of such an appeal may well be doubted. However, inasmuch as the Audubon and other societies have accomplished so much for the protection of our native birds, and the Boy Scout and Camp Fire Girl movements have made such a marked improvement in the conduct of our young people of both sexes, it is sincerely to be hoped that something will yet be done for the protection

of our wild flowers. With this object in view, the writer would earnestly urge upon all teachers, and particularly upon all parents into whose hauds this list may come, to impress upon children the importance and desirability of not plucking or destroying wild flowers. This is all the more necessary from the fact that the most beautiful and the most fragrant are among the first to be plucked and destroyed.

In the vicinity of Portland the plants and shrubs which suffer most from this species of vandalism are:

Western tiger lily	Low Oregon grape
Cream colored adder's tongue	Vanilla leaf
Western Solomon's seal	Small toothwort
Oregon fairy bells	Western syringa
Mottled leaf wake robin	Red flowered currant
Large wake robin	Indian cherry
Purple flag	Western dog violet
White ladies' slipper	Yellow wood violet
Calypso	Leafless wintergreen
Oregon grape	Large hound's tongue

The figure 1 following the name of a plant signifies that it is an annual, 2 a biennial and 4 a perennial.

For the benefit of those who use Howell's Flora of Northwest America, where, owing to changes in nomenclature, the name of a plant given in this list differs from that used in the Flora, the latter is given in parenthesis. The letter x in the margin opposite the name of a plant signifies that it is not included in Howell's Flora.

My thanks are due to George H. Himes, a pioneer of 1853 for data regarding the date and introduction of certain "weeds" into the northwest, etc.

PTERIDOPHYTA Ferns and Fern Allies

OPHIOGLOSSACEAE Presl. Adder's tongue Family.

BOTRYCHIUM Sw. Moonwort.

BOTRYCHIUM SILAIFOLIUM Presl. Western grape fern.
Moist ground near the car shops. May, June,

POLYPODIACEAE R. Br. Fern Family.

POLYPODIUM [Tourn.] L. Polypody.

POLYPODIUM OCCIDENTALE (Hook.) Maxon. Licorice fern. Common on rocks, logs, maple and ash trees, Macleay Park and in moist gulches along St. Helens road, Bybee's slough, etc. June, July.

CEROPTERIS Link.

CEROPTERIS TRIANGULARIS (Kaulf.) Underw. Gold-back fern. Dry rocky ridges, Rocky Butte, Mt. Scott, etc. May, June.

PTERIDIUM SCOP. Bracken.

PTERIDIUM AQUILINUM PUBESCENS (Bong.) Underw. Western bracken. Common in open woods everywhere around Portland. A specimen with a stalk over 11 feet in length has been found in this vicinity. The woody rootstocks have proved very troublesome to farmers for some years after land is first broken. July, August.

ADIANTUM [TOURN.] L. Maidenhair.

ADIANTUM PEDATUM L. Maidenhair fern. Common in moist shady places, Elk Rock, Barnes road, Macleay Park, Germantown road, etc. June to August.

STRUTHIOPTERIS Scop.

STRUTHIOPTERIS SPICANT (L.) Weiss. Deer fern. Moist woods and stream banks, Macleay Park, St Helens road. May to July.

ASPLENIUM L. Spleenwort.

ASPLENIUM TRICHOMANES L. Maidenhair spleenwort. Dry rocky cliffs, Rocky Butte. June, July.

FILIX ADANS. Bladder fern.

FILIX FRAGILIS Underw. Bladder fern. Common on shady cliffs, Balch creek. June, July.

POLYSTICHUM Roth. Christmas fern.

POLYSTICHUM MUNITUM (Kaulf.) Presl. Christmas fern, Sword fern. Common in coniferous woods, Macleay Park, etc. This handsome evergreen fern is generally known as "Christmas

fern" in Oregon, and is the one most used for holiday and other decoration in Portland, for which purpose its tall, graceful fronds (2 to 4 feet long) are eminently suited. It readily adapts itself to cultivation and can be found growing in numerous private grounds throughout the city. June to August.

DRYOPTERIS Adans. Shield fern, Wood fern.

DRYOPTERIS SPINULOSA DILATATA (Hoffm.) Underw. Glandular wood fern. Stream banks and dense moist woods, Balch creek, St. Helens road. June, July.

DRYOPTERIS ARGUTA (Kaulf.). Western wood fern. Dry rocky ridges near Milwaukie. June, July.

WOODSIA R. Br. Northern fern.

WOODSIA SCOPULINA D. C. Eaton. Western Woodsia. Common on shady cliffs, Rocky Butte and Willamette river. June to August.

MARSILEACEAE R. Br. Marsilea Family.

MARSILEA L. Four-leaved clover.

MARSILEA VESTITA Hook. & Grev. Hairy four-leaved clover. Wet, sandy banks, Willamette river, Bridgeton, Hayden island, etc. May to July.

SALVINIACEAE Reich. Salvinia Family.

AZOLLA Lam. Water moss.

AZOLLA CAROLINIANA Willd. Floating waterweed. In ponds, Oswego, Oak Grove, East Portland, etc. May to July.

EQUISETACEAE Michx. Horsetail Family.

EQUISETUM L. Horsetail, Scouring rush.

EQUISETUM ARVENSE L. Field horsetail. Moist ground, Guild's lake, Swan island, etc. March to May. Sterile, May, June.

EQUISETUM ROBUSTUM A. Br. Large scouring rush. Wet places and stream banks, Willamette river. April to August.

EQUISETUM HYEMALE L. Scouring rush. Stream banks and wet places, Macleay Park, Mt. Tabor, etc. April to August.

EQUISETUM TELMATEFIA Ehrh. Large horsetail. Wet places and moist creek banks, Balch creek, Fulton, Lower Albina, etc. April to July.

LYCOPODIACEAE Michx. Club moss Family.

LYCOPODIUM L. Club moss.

LYCOPODIUM CLAVATUM L. Running pine. Moist coniferous woods and ravines, St. Helens road. Rare here. June, July

SELAGINELLACEAE Underw. Selaginella Family.

SELAGINELLA Beauv. Tree moss.

SELAGINELLA DOUGLASII (H. & G.) Spring. Douglas' Selaginella. Moist slopes above Milwaukie; moist rocky slopes, Macleay Park. May to July.

SELAGINELLA RUPESTRIS (L.) Spring. Rock Selaginella. On rocky cliffs, Elk Rock. July, August.

ISOETACEAE Horan. Quillwort Family.

ISOETES L. Quillwort.

ISOETES NUTTALLII A. Br. 4. Nuttall's quillwort. Open fields along ditches, Gladstone. May to July.

ISOETES sp. 4. In ponds opposite Oswego. May to July.

SPERMATOPHYTA. Seed bearing plants.

CLASS I. GYMNOSPERMAE—POLYCOTYLEDONES

PINACEAE Lindl. Pine Family.

PINUS [Tourm.] L. Pine.

PINUS PONDEROSA BENTHAMIANA (Hartw.) Vasey. Foot-hills yellow pine. Common near the car shops. April, May.

PINUS MURRAYANA Balfour. Lodgepole pine. Common on sandy slopes near Troutdale. April, May.

TSUGA (Endl.) Carr. Hemlock.

TSUGA HETEROPHYLLA (Raf.) Sargent. Western hemlock. Common in fir woods, Macleay Park, Mt. Tabor. April, May.

PSEUDOTSUGA Carr. Douglas fir.

PSEUDOTSUGA MUCRONATA (Raf.) Sudw. Douglas fir. Common in all coniferous woods around Portland. The largest tree

of this species yet found in Multnomah county is 11 feet in diameter breast high, and is a fairly perfect specimen. April, May.

ABIES Juss. Fir.

ABIES GRANDIS Lindl. Lowland fir. Occurs in moderate quantities in all coniferous woods around Portland, and numerous trees are still to be found in vacant lots throughout the city. April, May.

THUJA L. Arbor vitae.

THUJA PLICATA Donn. Western red cedar. On nearly all wooded slopes around Portland, but never occurring in pure stands. April, May.

TAXACEAE Lindl. Yew Family.

TAXUS [Tourn.] L. Yew.

TAXUS BREVIFOLIA Nutt. Western yew. Infrequent in moist ravines and on stream banks, Macleay Park and near Wil-bridge. The largest specimen yet found in Multnomah county is 24 inches in diameter. March, April.

CLASS II. ANGIOSPERMAE—MONOCOTYLEDONES

TYPHACEAE J. St. Hil. Cat tail Family.

TYPHA [Tourn.] L. Cat tail.

TYPHA LATIFOLIA L. 4. Common cat tail. In ditches and mucky ponds at The Oaks, near Milwaukie, and along St. Helens road between the road and Willamette river. May, June.

SPARGANIACEAE Agardh. Bur reed Family.

SPARGANIUM [Tourn.] L. Bur reed.

SPARGANIUM EURYCARPUM Engelm. 4. Broad fruited bur reed. In ponds near the car shops. June, July.

NAIADACEAE Lindl. Pond weed Family

POTAMOGETON [Tourn.] L. Pond weed.

POTAMOGETON NATANS L. 4. Floating pond weed. In ponds and sluggish streams, Columbia slough. June, July.

POTAMOGETON AMPLIFOLIUS Tricketm. 4. Large leaved pond weed. In ponds along Columbia slough. May, June.

POTAMOGETON RICHARDSONII (Bennett) Rydb. 4. Richardson's pond weed. In Willamette river below Portland; infrequent. May, June.

POTAMOGETON FOLIOSIS Raf. 4. Leafy pond weed. In ponds, Columbia slough; infrequent. May, June.

ZANNICHELLIA [Mich.] L. Horned pond weed.

ZANNICHELLIA PALUSTRIS L. 1. Horned pond weed. In ponds near Vancouver ferry. May, June.

NAIAS L. Naiad.

NAIAS FLEXILIS (Willd.) K. & S. 1. Slender Naiad. On bars in the Willamette river below Portland. May, June.

ALISMACEAE DC. Water plantain Family.

ALISMA L. Water plantain.

ALISMA PLANTAGO AQUATICA L. 4. Water plantain. In ponds near Olwego; infrequent. May to August; flowers white, small.

SAGITTARIA L. Arrowhead.

SAGITTARIA ARIFOLIA Nutt. 4. Arrow leaved arrowhead. (*S. cuneata* Sheldon, as to the deep water form.) Margins of ponds, Swan island, Suavie's island, Bridgeton, Oak Grove, etc. July, August; white.

" SAGITTARIA LATIFOLIA Willd. 4. Wapato. (*S. esculenta* of Howell's Flora.)" In ponds, Moks bottom and near Oak Grove. This species formerly grew sparingly in the slough on East Morrison and East Stark streets, but disappeared there when the present fills were made. " It grows abundantly in shallow lakes, ponds, sloughs and low-lying river shores from British Columbia to California, and prior to the advent of the white man its tubers constituted a source of vegetable food for the northwest Indians second only to the Camas. The tubers were gathered by the klooches, frequently in April, but usually in October, and unlike the Camas could be kept in the raw state for two or three months or more. They were cooked in three or four different ways. 1. Steaming. When the tribe lived close to the ocean, a platform of stones was heated and covered with

a mat of damp seaweed on which a layer of the tubers was placed, and being overlaid by more seaweed and hot stones, was allowed to steam for about two hours. The tubers were then ready to be eaten. 2. Boiling. A second method was to put the tubers into a waterproof basket, cover them with water and heat the water with hot stones until the tubers were boiled. This process required two hours or more. 3. Pit cooking. In the third method the tubers being collected, a small square, or more usually oblong, pit about 3 feet wide by 5 or 6 feet long and 2 feet deep was made in the ground, a layer of hot stones placed in the bottom and covered with a mat of bracken and ferns, on which a layer of the tubers was laid and the process repeated until two layers of tubers had thus been covered. The pit was left undisturbed for about 48 hours, until the cooking was complete. The tubers were then exhumed and the outer coat being removed, were ready to be eaten. 4. Baking. The usual method in use by the Indians, however, was to bake the plant in hot ashes. The tubers were placed in very hot ashes and allowed to remain for about an hour. They were then raked out of the ashes and the tough outer coat being removed, were eaten while hot. This method had many advantages: a. only a sufficient quantity for the immediate meal need be cooked; b. they were eaten hot and the flavor was much improved when they were cooked in this way—in fact, it was the only mode of cooking that rendered them really palatable to the white man; and c. the time required to cook and prepare the meal was considerably less than by any of the other methods, a factor that counted for much at the end of a long day's journey or an arduous hunt.

When it was desired to put up the plant for future use, pit cooking was the method adopted, and the tubers after removal from the pit and husking the outer coat, were reduced to a sort of dough or paste and made into small roundish cakes about 3 inches in diameter and 1 to 2 inches thick, and were then fire dried and put away for winter use.

The Chinese in Oregon and California relish the Wapato, and to this day use it for food wherever it can be obtained in sufficient quantities to justify gathering it. The introduction of

carp into the lower Columbia and its tributaries, however, has resulted in the plant being almost exterminated in this section, while the draining of shallow lakes such as Lake Labish, Marion county, and Wapato lake, Yamhill county, for farming purposes, has been equally destructive to the species in other localities.

The following quotation from the Oregonian of April 14, 1865, shows how the Chinese in Portland appreciated the tubers of this plant fifty years ago:

“Wapatos—The kloochmen and Siwashes in this vicinity are just now in their element, the season having arrived for digging wapatos which they barter to the Celestial citizens for a fair price. The trade is said to have been carried on very extensively between them and the aboriginal population during the past week.” July to September; white.¹¹

POACEAE R. Br. Grass Family.

PASPALUM L.

PASPALUM DISTICHUM L. 4. Knot grass. Moist sandy ground, Columbia slough. This grass is native in the southeastern states to California, but introduced along the banks of the lower Columbia river in Oregon and Washington. July, August.

PANICUM L. Panic grass.

PANICUM CAPILLARE L. 1. Witch grass. In fields, yards and cultivated grounds around Portland. June to September.

PANICUM SCRIBNERIANUM Nash. 4. Scribner's panic grass. On sandy hillsides above Inman-Poulson Lumber Co.'s mill and near St. John's, Brooklyn, etc. June to August.

ECHINOCHLOA Beauv.

ECHINOCHLOA CRUS GALLI (L.) Beauv. 1. Barnyard grass. (*Panicum Crus galli* of Howell's Flora.) In yards, fields and waste places around Portland. Naturalized from Europe. Grows freely in moist, rich ground, but in lawns and fields is continually crowded out by other grasses. June to September.

CHAETochLOA Scribn. Bristly foxtail.

CHAETochLOA VIRIDIS (L.) Scribn. 1. Green foxtail. In yards and fields around Portland. Naturalized from Europe. June to August.

PHALARIS L. Canary grass.

PHALARIS ARUNDINACEA L. 4. Reed Canary grass. Infrequent in moist ground on Swan island, etc. June, July.

PHALARIS CANARIENSIS L. 1. Canary grass. In waste places, Lower Albina and East Portland. Naturalized from Europe. May to July.

ANTHOXANTHUM L. Sweet vernal grass.

ANTHOXANTHUM ODORATUM L. 4. Sweet vernal grass. Infrequent in lawns and waste places. Naturalized from Europe; very fragrant in drying. May to July.

SAVASTANA Schrank. Holy grass.

SAVASTANA MACROPHYLLA Beal. 4. Large vanilla grass (*Hierochloa macrophylla* of Howell's Flora.) A broad leaved perennial, infrequent in open woods around Portland. Quite fragrant on drying, and on this account frequently used to scent bureau drawers, where it has been known to retain its fragrance for twenty years or more. April to June.

PHLEUM L. Timothy.

PHLEUM PRATENSE L. 4. Timothy. Common in fields and old meadows around Portland. Naturalized from Europe. The best of all the grasses for forage purposes. Some American authors regard this species as native. It certainly is not so in Oregon or Washington. June, July.

ALOPECURUS L. Foxtail.

ALOPECURUS GENICULATUS L. 4. Marsh foxtail. In wet places along the Columbia and Willamette. June to August.

POLYPOGON Desf. Beard grass.

POLYPOGON MONSPELIENSIS (L.) Desf. 1. Beard grass. Wet ground, North Portland, Lower Albina, Columbia Beach, Hayden island, etc. Naturalized from Europe in the Atlantic states, but native in Oregon and Washington. May to August.

POLYPOGON LITTORALIS (With.) Smith. 4. Water beard grass. Wet ground, Lower Albina and South Portland. May to August.

AGROSTIS L. Bent grass.

AGROSTIS AEQUIVALVIS Trin. Slender bent grass. Infrequent on moist slopes, Mt. Scott. June to August.

x AGROSTIS DEPRESSA Vasey. 4. Creeping bent grass. Not uncommon on moist sandy banks about Bridgeton, Columbia Beach, etc. It here serves a useful purpose as a sand binder. June to September.

AGROSTIS ALBA L. 4. Red top. A valuable forage grass common in waste places, Albina and East Portland. Naturalized from Europe here, but native northward. June to August.

AGROSTIS EXARATA Trin. 4. (*A. asperifolia* Trin.) Northern red top. Infrequent in moist ground, East Portland, Albina, Columbia Beach, Hayden island, etc. A fairly good forage grass and relished by stock. June, July.

AGROSTIS MICROPHYLLA Steud. 1. Small leaved bent grass. A small annual infrequent in open woods near Oswego. June, July

AGROSTIS DIEGOENSIS Vasey. 4. Leafy bent grass. A slender perennial occuring sparingly on rocky slopes, Elk Rock. June to August.

AGROSTIS HYEMALIS (Walt.) B. S. P. (*A. scabra* of Howell's Flora.) Rough hair grass. A slender perennial, on sandy river banks near Brooklyn. June to August.

CINNA L. Indian reed.

CINNA LATIFOLIA (Trev.) Griseb. 4. (*C. pendula* of Howell's Flora.) Slender wood reed grass. A slender perennial, in moist open woods near Oswego. July to September.

CALAMAGROSTIS Adans. Reed grass.

CALAMAGROSTIS HOWELLII Vasey. 4. Howell's reed grass. Densely tufted perennial on cliffs at Bridal Veil. July to Sept.

CALAMAGROSTIS CANADENSIS Beauv. 4. Blue joint grass. Fairly common perennial in wet ground, Columbia slough. June to August.

BECKMANNIA Host. Slough grass.

BECKMANNIA ERUCAEFORMIS (L.) Host. 4. Slough grass. Tall, erect perennial, common in ditches at Oswego and wet places about Oswego lake. May to August.

ELEUSINE Gaertn. Yard grass.

ELEUSINE INDICA Gaertn. 1. Yard grass. Yards, railroad tracks and waste places, Albina and East Portland. Naturalized from tropical Europe and Asia. June to September.

x ELEUSINE CORACANA Pers. 1. Tall yard grass. Ballast ground and waste places, Lower Albina; coarse annual, taller than *E. indica*. Naturalized from tropical Europe and Asia. June to September.

PENTAMERIS Beauv. Wild oat grass.

PENTAMERIS CALIFORNICA (Boland.) Nels. & Macb. 4. Western wild oat grass. (*Danthonia californica*.) In fields and waste places near Oswego. May to July.

AVENA [Tourn.] L. True oats.

AVENA FATUA L. 1. Wild oats. Common in fields and waste places around Portland. Naturalized from Europe. June to Aug.

AVENA FATUA GLABRATA Petern. 1. Smooth wild oats. A common, more or less troublesome weed in fields, roadsides and waste places around Portland. Naturalized from Europe. June to August.

TRisetum Pers. False oat.

TRisetum CANESCENS Buckley. 4. Hoary false oat. Occurs sparingly on rocky slopes about Elk Rock and along the Willamette river near Oswego. May to August.

TRisetum SPICATUM (L.) Richter. 4. (*T. subspicatum*.) Narrow false oat. Along railroad tracks and in waste places, Lower Albina. Unnoubtedly introduced here from eastern Oregon or Washington. June to September.

AIRA L. Hair grass.

AIRA CARYOPHYLLEA L. 1. Silvery hair grass. Delicate, silvery annual, in fields, vacant lots and waste places around Portland. Naturalized from Europe. June to August.

DESCHAMPSIA Beauv. Stout hair grass; tickle grass.

DESCHAMPSIA CAESPITOSA (L.) Beauv. 4. Tufted hair grass. Open glades and wet ground along Columbia slough. June, July.

DESCHAMPSIA CALYCINA Presl. 1. Tickle grass. Slender annual on dry slopes and poor soil, East Portland, Oswego, etc. May to July.

ARRHENATHERUM Beauv. Oat grass.

ARRHENATHERUM ELATIUS (L.) Beauv. 4. Tall oat grass. Tall perennial and fairly good forage grass, in fields and waste places around Portland. Naturalized from Europe. May to July.

HOLCUS L. Velvet grass.

HOLCUS LANATUS L. 4. Mesquite. Downy perennial, in fields, old meadows and waste places around Portland. Naturalized from Europe. June, July.

DACTYLIS L. Orchard grass.

DACTYLIS GLOMERATA L. 4. Orchard grass. Tall, tufted perennial and a fair forage grass, in fields and waste places around Portland. Naturalized from Europe. June to August.

KOELERIA Pers. Koeler grass.

KOELERIA CRISTATA (L.) Pers. 4. Crested Koeler grass. Tufted perennial on sandy river banks, Oswego. May to July.

MELICA L. Melic grass.

MELICA HARFORDII Boland. 4. Harford's melic grass. Infrequent on rocky slopes, Elk Rock and near Linnton. May to July

PANICULARIA Fabr. Manna grass.

PANICULARIA BOREALIS Nash. 4. Slender manna grass. Slender aquatic perennial in very wet ground and shallow ponds around Oswego. May to July.

PANICULARIA NERVATA (Willd.) Kuntze. 4. Nerved manna grass. Tall aquatic perennial, infrequent in wet places and on stream banks around Oswego. May to August.

PANICULARIA PAUCIFLORA (Presl) Kuntze. 4. Smooth manna grass. Smooth aquatic perennial, not rare in shallow ponds around Oswego. May to August.

PANICULARIA AMERICANA (Torr.) MacM. 4. Tall manna grass. The tallest species of the genus, frequently 5 feet high. Rare in wet places, South Portland. June to August.

PLEUROPOGON R. Br. Side beard.

PLEUROPOGON REFRACTUM (Gray) Vasey. 1. Tufted side beard. Infrequent on moist banks, Balch creek and Linnton road. June to August.

POA L. Meadow grass; blue grass.

POA ANNUA L. 1. Annual blue grass. Common in fields and waste places around Portland. Our earliest flowering grass. Naturalized from Europe. Though introduced, this species is common on bottom lands along the lower Columbia river, and will withstand two to three months submergence, say May 1 to August 1, without apparent injury. It and other bottom land grasses usually grow at a little higher elevation than the bottom land sedges, *Carex aperta* etc. April to October.

POA NERVOSA (Hook.) Vasey. 4. Smooth spear grass. Tall perennial, infrequent in open places and rocky slopes, Elk Rock, etc. May to July.

POA HOWELLII Vasey & Scribn. 4. Pale green spear grass. Densely tufted perennial, on rocky slopes, Elk Rock and in open woods near Oswego. May to July.

POA PRATENSIS L. 4. Blue grass. Variable perennial and valuable forage grass, common in fields, meadows and waste places everywhere. May to August.

POA COMPRESSA L. 4. Canada blue grass. Common in old pastures, fields and waste places around Portland. Naturalized from Europe. May to September.

POA TRIFLORA Gilib. 4. (*P. flav.*) Fowl meadow grass. Common on moist slopes and river bottoms, Columbia slough. A desirable forage grass, and, as well as the annual blue grass, will withstand two or three months submergence on bottom lands without apparent injury. June to August.

POA GRACILLIMA Vasey. 4. Slender spear grass. Densely tufted perennial, infrequent on rocky cliffs near Oswego. June to August.

x POA MULTNOMAE Piper. 4. Multnomah blue grass. The type of this grass was collected by C. V. Piper in 1904 at Multnomah Falls, which is somewhat beyond our range, but the species undoubtedly extends into our limits. June to August.

x POA ALCEA Piper. 4. Rock spear grass. Infrequent on rocky slopes, Elk Rock. Type collected here by C. V. Piper, June 3, 1904. May to July.

ERAGROSTIS Beauv. Meadow grass.

ERAGROSTIS HYPNOIDES (L.) B. S. P. 1. Creeping meadow grass. (*E. reptans*.) Smooth annual not infrequent on muddy stream banks of Willamette river at Oregon City and Columbia river at Bridgeton, Columbia Beach, Vancouver. May to Sept.

FESTUCA L. Fescue.

FESTUCA MICROSTACHYS (Munro) Nutt. 1. Slender annual, in open woods, Macleay Park and St. Helens road. May to Aug.

FESTUCA MYUROS L. 1. Squirrel tail fescue. Common in fields and waste places around Portland. Naturalized from Europe. May to July.

FESTUCA OCTOFLORA Walt. 1, 2. Slender fescue. Slender tufted annual, in open woods, Macleay Park and St. Helens road. May to July.

FESTUCA ELATIOR L. 4. Meadow fescue. Common in fields, vacant lots and waste places around Portland. Naturalized from Europe. June to August.

FESTUCA SUBULATA Trin. 4. Wood fescue. (*F. Jonesii*.) Moist open woods, Macleay Park and St. Helens road. May to July

x FESTUCA HASTII Kunth. Ballast waif, on ballast and about railroad tracks, Lower Albina. Adventive from Europe. May to August.

BROMUS L. Brème grass.

BROMUS SECALINUS L. 1, 2. Chess. Common in fields and waste places around Portland. Rather troublesome annual weed in grain fields and meadows. Naturalized from Europe. May to August.

x BROMUS ARVENSIS L. 1, 2. Field chess. Infrequent in fields and waste places around Portland. Adventive from Europe. June to August.

BROMUS HORDEACEUS L. 1, 2. Soft chess. Infrequent in fields and vacant lots around Portland. Adventive from Europe. June to August.

BROMUS STERILIS L. 1, 2. Barren brome grass. Moist ground and waste places, Lower Albina, St. Johns, etc. Adventive from Europe. May to June.

BROMUS EXIMIUS UMBRATICUS Piper. 4. Western brome grass. (*B. vulgaris*.) Infrequent in open woods, Macleay Park, and on grassy slopes, Elk Rock. May, June.

BROMUS MARGINATUS Nees. 4. Coarse brome grass. Common in coarse tufts in fields and waste places. May to July.

BROMUS CARINATUS H. & A. 4. Pyramidal brome grass. Infrequent in moist, sandy soil, Lower Albina. Short lived perennial here. May to July.

LOLIUM L. Rye grass.

LOLIUM PERENNE L. 4. Rye grass. Short lived perennial, common in fields, roadsides and waste places around Portland. Naturalized from Europe. April to July.

LOLIUM TEMULENTUM L. 1. Bearded darnel. Tall annual infrequent in fields and waste places, rather regarded as a weed by farmers. Naturalized from Europe. May to July.

AGROPYRON J. Gaertn. Wheat grass.

AGROPYRON SPICATUM (Pursh) Scribn. & Smith. 4. Wheat bunch grass. (*A. divergens*.) Ballast ground and waste places, Lower Albina. Densely tufted perennial, undoubtedly introduced here from east of the Cascade mountains. May to July.

AGROPYRON BIFLORUM (Brign.) R. & S. 4. Northern wheat grass. (*A. violaceum*) Infrequent along railroad tracks and waste places, Oregon City. Introduced here, as it belongs from Washington northward and eastward. May to August.

AGROPYRON OCCIDENTALE Scribn. 4. Western blue joint. (*A. Smithii*.) Erect perennial in meadows and bottom lands about Columbia slough. May to July.

HORDEUM [Tourn.] L. Barley.

HORDEUM PUSILLUM Nutt. 1. Little barley. Small annual in waste places, Lower Albina and East Portland. Probably introduced here from eastern Oregon. May to July.

HORDEUM NODOSUM L. 1, 4. Meadow barley. Infrequent in moist ground, Columbia slough. Evidently a perennial here. April to June.

ELYMUS L. Wild rye; lyme grass.

ELYMUS CONDENSATUS Presl. 4. Smooth lyme grass. Tall, densely tufted perennial, not uncommon in moist bottom land, Columbia slough. May to August.

CYPERACEAE J. St. Hil. Sedge Family.

CYPERUS [Tourn.] L. Lowland sedge.

CYPERUS ARISTATUS Rottb. 1. Awned Cyperus. (*C. inflexus*.) Muddy and sandy banks along Willamette river, along Columbia river near Vancouver, Columbia Beach, Hayden island, etc. Faintly fragrant in drying. June to September.

CYPERUS ERYTHORRHIZOS Muhl. 1. Red rooted Cyperus. Wet ground near Oswego and borders of ponds, Bridgeton, Columbia Beach, Hayden island, etc. July to September.

DULICHIMUM L. C. Rich.

DULICHIMUM ARUNDINACEUM (L.) Britton. 4. Hollow stem. (*D. spathaceum*.) Moist boggy ground near Oswego. July to Oct.

SCIRPUS [Tourn.] L. Bulrush.

SCIRPUS OCCIDENTALIS (Wats.) Chase. 4. Tule. In wet, boggy ground near Oswego and along St. Helens road below Linnton. June to September.

SCIRPUS MICROCARPUS Presl. 4. Panicked bulrush. Creek banks and moist woods, Macleay Park, Laurelhurst Park, etc. June to September.

ELEOCHARIS R. Br. Spike rush.

ELEOCHARIS OBTUSA (Willd.) Schultes. 1. Ovoid spike rush. (*E. ovata*.) Moist ground and about springs, Oswego. June to Sept

ELEOCHARIS PALUSTRIS (L.) R. & S. 4. Tall spike rush. Moist ground, Mock's bottom. July to September.

ELEOCHARIS ACICULARIS R. & S. 4. Needle spike rush. Wet ground, Columbia slough. June to September.

CAREX [Rupp.] L. Sedge.

CAREX MONILE Tuckerm. 4. Necklace sedge. Common in wet ground and bottom lands, Suavie's island, Columbia slough,

etc. A useful forage plant, locally known as "slough grass" (a name that more properly belongs to *Beckmannia erucaeformis*). This sedge will withstand three or four months submergence in summer on bottom lands along the Columbia river without apparent injury. May to August.

CAREX MIRATA Dewey. 4. Swale sedge. (*C. exsiccata*.) In swales and boggy ground, Oswego, Sauvie's island, etc. This sedge is largely used in iron foundries, where it is twisted into a sort of rope and wound around iron pipe cores to facilitate their extraction from the pipe after being cast. May to August.

CAREX LANUGINOSA Michx. 4. Woolly sedge. Fairly common in moist ground, Swan island, Ross island. May to Aug.

CAREX DECIDUA Boott. 4. Creek sedge. Stream banks, Balch creek and in ravines, St. Helens road. This species frequently grows in creeks where it is sometimes submersed for a month or more in spring and early summer. June to Aug.

CAREX APERTA Boott. 4. Hay sedge. (*B. bovina* Howell.) A slender, densely tufted plant, forming extensive meadows on overflowed bottom lands in the valley of the Columbia and its tributaries. Largely cut for hay, and regarded by farmers as the best forage sedge. Common about Columbia slough, etc. June to Aug.

CAREX SITCHENSIS Prescott. 4. Black heads. Wet places, East Portland, Car shops, Oak Grove, etc. Tall, stout evergreen species, with noticeably dark purple to almost black spikes. May to Aug.

CAREX HENDERSONI Bailey. 4. Henderson's sedge. Broad leaved species, in coniferous woods, Macleay Park, Laurelhurst Park, Willamette Heights, etc. June to August.

CAREX AUREA Nutt. 4. Golden fruited sedge. Common in upland swales and wet meadows, Oswego, Woodlawn, etc. This species and its variety commonly occur with *Spiraea Douglasii*. June, July.

CAREX AUREA CELSA Bailey. 4. Tall golden sedge. Upland swales and wet meadows, Oswego, Laurelhurst Park, St. Johns,

etc. A taller plant with larger spikes than the type, but much less common. June, July.

CAREX UMBELLATA Schk. 4. Matted sedge. Infrequent in dry ground south of Elk Rock. April to July.

CAREX STIPATA Muhl. 4. Awl fruited sedge. Fairly common in moist open woods and wet ground, East Portland and about Oswego. May to July.

CAREX VICARIA Bailey. 4. Rust colored sedge. Wet places, Oswego, south of Milwaukie and about Vancouver. May to July.

CAREX STERILIS Willd. 4. Little prickly sedge. Fairly common in moist ground near Oswego. May to July.

CAREX DEWEYANA Schwein. 4. Dewey's sedge. Coniferous woods, Sauvie's island, Swan island, and near Linnton. May to August.

CAREX BOLANDERI Olney. 4. Bolander's sedge. Moist coves, Sauvie's island and near Linnton. May to Aug.

CAREX FETA Bailey. 4. Western sedge. Swales and wet ground, Oswego, Vancouver, etc. May to July.

CAREX FESTIVA Bailey. 4. Dark rusty sedge. Moist grassy places, Swan island, Ross island, etc. June, July.

x *CAREX MACROCHAETA* C. A. Meyer. 4. Long bristled sedge. Infrequent on stream banks, Multnomah Falls westward to Bridal Veil. June to August.

ARACEAE Necker. Arum Family.

LYSICHITON Schott. Skunk cabbage.

LYSICHITON KAMTSCHATCENSIS (L.) Schott. 4. Western skunk cabbage. Common in boggy ground, South Portland, Fulton, Oak Grove, etc. February to April; yellow.

LEMNACEAE Dumort. Duckweed Family.

LEMNA L. Duckweed.

LEMNA TRISULCA L. 4. Ivy leaved duckweed. Common in ponds, East Portland, Oswego, Oak Grove, etc. June to Aug.; green.

SPIRODELA Schleid. Greater duckweed.

SPIRODELA POLYRHIZA (L.) Schleid. 4. Greater duckweed.

In ponds, Guild's lake, South Portland, Oswego, etc. June to Aug.; green.

JUNCACEAE Vent. Rush Family.

JUNCUS [Tourn.] L. Rush.

JUNCUS EFFUSUS L. 4. Common rush. Common in ditches and bogs, East Portland, St. Helens road, etc. The stems are used for fine basketry by the Indians. June, July.

JUNCUS BUFONIUS L. 1. Toad rush. Common along roadsides everywhere. Not relished by stock of any kind, and practically worthless as forage. May to Aug.

JUNCUS TRIFORMIS Engelm. 1. Pacific rush. Roadsides East Portland, Albina, etc. May to July.

JUNCUS TENUIS Willd. 4. Slender rush. Densely tufted, variable perennial with wiry stems, common on roadsides and moist ground, East Portland, etc. May to Aug.

JUNCUS OCCIDENTALIS (Coville) Wiegand. 4. Western rush. Infrequent in moist ground, East Portland, Mt. Scott, etc. May to July.

JUNCUS FALCATUS E. Meyer. 4. Creek bank rush. Infrequent in moist springy places, Balch creek, Oswego. June, July.

JUNCUS DUBIUS Engelm. 4. Marsh rush. Infrequent in moist ground, Lower Albina and East Portland. June, July.

JUNCUS ENSIFOLIUS Wiks. 4. Sword leaved rush. In wet places, South Portland and East Portland. June, July.

JUNCUS OXYMERIS Engelm. 4. Bog rush. Infrequent in marshy ground, South Portland. May to July.

JUNCOIDES [Dill.] Adans. Wood rush.

JUNCOIDES PARVIFLORUM (Ehrh.) Coville. 4. Forest wood rush. Not uncommon in open woods, Portland Heights, Canyon road, etc. June, July.

JUNCOIDES COMOSUM MACRANTHUM (Wats.) Parish. 4. Long flowered wood rush. Fields and open woods, Portland Heights, South Portland and Fulton. May to July.

MELANTHACEAE R. Br. Bunch flower Family.

VERATRUM [Tourn.] L. False hellebore.

VERATRUM CALIFORNICUM Durand. 4. Pacific white hellebore. Infrequent in open moist ground, Milwaukie. May to July; greenish white.

STENANTHELLA Rydb.

STENANTHELLA OCCIDENTALIS Rydb. 4. Grass leaved lily. Infrequent on rocky cliffs, Elk Rock, Multnomah Falls, etc. May to July; brownish purple.

ZYGADENUS Michx. Zygadenus.

ZYGADENUS VENENOSUS Wats. 4. Poison camas. Moist open ground, Oswego and Willamette Falls. April to June; yellowish.

LILIACEAE Adans. Lily Family.

LILIUM [Tourn.] L. Lily.

LILIUM PARVIFLORUM (Hook.) Holz. 4. Western tiger lily. (*L. columbianum*.) Not uncommon in open woods near Council Crest, Rocky Butte, Bertha. June, July; orange with purple dots.

FRITILLARIA L. Mission bells; rice root.

FRITILLARIA LANCEOLATA Pursh. 4. Checkered lily. Not uncommon in open woods near City Park, Canyon road, Fulton, etc. Frequent under scrub oaks. May to July; mottled purple and greenish yellow.

ERYTHRONIUM L. Dog tooth violet.

ERYTHRONIUM GIGANTEUM Lindl. 4. Cream colored adder's tongue. Fields and open woods, Brooklyn, Sellwood, Elk Rock. Common along Oregon City road (east side). April, May; cream color.

CALOCHORTUS Pursh. Mariposa lily.

CALOCHORTUS TOLMIEI H. & A. 4. Tolmie's cat's ear tulip. Infrequent in open woods and river banks near Milwaukie; May, June; yellowish purple.

CALOCHORTUS PURDYI Eastw. 4. Purdy's cat's ear tulip. Grassy slopes Tualatin valley and along the railroad between Portland and Dundee. Not quite within our limits. May, June; cream color tinged with purple.

QUAMASIA Raf. Camas.

QUAMASIA QUAMASH (Pursh) Coville. 4. Camas. (*Camasia*

esculenta.) Fairly common in moist rich ground, open woods and fields, Sellwood, Milwaukie, Happy Hollow road, etc. In our limits the leaves are usually one-fourth to half inch wide, while in southern Oregon they are frequently found one inch wide. April, May; dark to light blue.

As the tunicated bulbs (about five-eighths to one inch or more in diameter) of this plant formed the chief source of vegetable diet among the Indian tribes of the whole northwest before the advent of the white man, a short description of the usual method of preparation as witnessed by pioneers in Yamhill county, Oregon, and in Thurston county, Washington, in the early fifties, may not be out of place here.

In early August, two or three days before the time set for the cooking, the klooches and children were sent to the nearest glade or meadow in which the plants grew in abundance, and a large pile of the bulbs were collected. An experienced man of the tribe was selected as chef, and in the early morning of the day appointed, a trench 3 to 4 feet wide by 6 to 10 feet long and about $2\frac{1}{2}$ feet deep was dug, a layer of small stones and pebbles 4 to 6 inches deep was placed in the bottom and a fire built thereon until the stones were quite hot. The embers were then removed, while in the meantime, amid energetic commands of "hyak," "hyak," from the chef, the klooches and children had quickly collected a pile of bracken and ferns, which were placed upon the hot stones and pressed down evenly until a mat about 5 inches deep was formed. Upon this mat of bracken a layer of the bulbs 6 to 8 inches deep was promptly laid, a thin layer of bracken 3 to 4 inches thick placed above it, then a thin layer of hot stones from an adjacent fire was added and the process repeated until (usually) 3 layers of bulbs had been placed in the pit and covered with a heavy layer of bracken and thin layer of hot stones. The last was overlaid with a thin mat of bracken and the whole covered with a layer of earth 5 inches thick and left undisturbed for about 24 hours, when the cooking was completed. The whole process was simply an aboriginal application of the "fireless cooker," and a very effective one for the purpose in view. The cooked bulbs, which were white when placed in

the pit, were then carefully exhumed and found to be a rich chocolate brown in color and quite palatable even to the neighboring whites, who were frequently invited to the feast which was then held. The bulbs retained their shape fairly well during the cooking, and such as were not immediately eaten were prepared for future use in various ways. Some, being stripped of the outer coat, were placed in a stone mortar, the kernels from roasted acorns of the western white oak, and frequently the kernels of the western hazel nut were added, and the contents of the mortar reduced to a paste which was usually eaten in that condition, but occasionally made into small cakes. This paste was highly nutritious, but the roasted acorns gave it a bitter flavor that was rather unpleasant to the Caucasian palate. Another mode was to add ripe blackberries instead of the roasted acorns, and this made a much more palatable dish. The usual method of preparation for winter use, however, was to add the various berries, such as blackberries, service berries, oso berries, salal berries and huckleberries, and occasionally a little dried salmon or dried venison was added, the whole reduced to a paste and moulded into oblong cakes 4 by 5 or 6 inches or larger and about $\frac{3}{4}$ inch thick. These cakes were occasionally made into fanciful shapes or stamped with ornamental figures and designs and often perforated and strung on hazel or arrowwood withes (for convenience in carrying on horseback). They were then fire dried and being placed in coarse baskets 2½ feet high by about 18 inches square, were covered with leaves and put away for future use.

In addition to the above-mentioned method of preparation, when a girl in the tribe had attained 17 years of age, it was customary for her to collect a sufficient quantity of the bulbs, dig a small pit about 3 feet square, fill it with 2 or 3 layers of bulbs and the necessary layers of ferns and hot stones, cook them as above, and then invite several young men of her acquaintance to partake of the feast. This was her "coming out," and it is safe to say that the most fashionable debutante in any class of modern society was never more successful in attaining the object in view, for old maids and grass widows alike were unknown social factors in Indian life. //

QUAMASIA LEICHTLINII (Baker) Coville. 4. Leichtlin's camas. Infrequent about margin of woods, Gladstone. This plant blooms about the time the flowers of *Q. Quamash* are disappearing. May, June; dark blue.

HOOKERA Salisb. Wild hyacinth.

HOOKERA CORONARIA Salisb. 4. Large flowered white hyacinth. (*Brodiaea grandiflora*.) Infrequent in dry open places, Oswego, Willamette Falls, etc. May to June; purple to light rose.

HOOKERA PULCHELLA Salisb. 4. Tall wild hyacinth. (*Brodiaea congesta*) Dry open places, Oswego, etc., not common. April, May; bluish purple.

CALLIPRORA Lindl. Wild hyacinth.

CALLIPRORA HYACINTHINA (Lindl.) 4. White wild hyacinth. (*Brodiaea lactea*.) Wet places, Linnton, Oswego, Willamette Falls, etc.; not uncommon. Frequently but erroneously called "white camas." April, May; white with green midvein.

ALLIUM [Tourn.] L. Onion.

ALLIUM CERNUUM Roth. 4. Nodding wild onion. Rocky cliffs near the mouth of Sandy river. June, July; rose color to white.

ALLIUM ACUMINATUM Hook. 4. Western wild onion. Infrequent on stream banks, Willamette river. May to July; dark rose to nearly white.

ALLIUM ATTENUIFOLIUM Kellogg. 4. Slender leaved onion. Infrequent on rocky cliffs, Elk Rock. May, June; pale rose to white.

CONVALLARIACEAE Link. Lily of the valley Family.

VAGNERA Adans. False Solomon's seal.

VAGNERA AMPLEXICAULIS (Nutt.) Greene 4. Western wild spikenard. Moist woods near Portland according to Sheldon, but we have not seen the specimens. April, May; white, small.

VAGNERA RACEMOSA (L.) Morong. 4. Wild spikenard. Open woods and rocky slopes, Rocky Butte, Linnton road, etc.; not uncommon. April to June; white, small.

VAGNERA SESSILIFOLIA (Nutt.) Greene. 4. Western Solo-

mon's seal. Not uncommon in moist woods, Macleay Park, St. Helens road, etc. April, May; white, small.

UNIFOLIUM Adans. May lily; wild lily of the valley.

UNIFOLIUM KAMTSCHATICUM (Gmel.) 4. Wild lily of the valley. (*U. dilatatum*.) Common in coniferous woods, Macleay Park, St. Helens road etc. May, June; white, small.

STREPTOPUS Michx. Twisted stalk.

STREPTOPUS AMPLEXIFOLIUS (L.) DC. 4. Large twisted stalk. Stream banks, Balch creek, St. Helens road, etc. April to June; greenish white.

STREPTOPUS ROSEUS Michx. 4. Small twisted stalk. Damp woods, St. Helens road; rather rare in the vicinity of Portland. April to June; purple to rose color.

DISPORUM Salisb. Fairy bells.

DISPORUM SMITHII (Hook) Piper. 4. Angular fruited fairy bells. (*D. Menziesii*.) Infrequent in moist coniferous woods, St. Helens road, etc. April, May; whitish.

DISPORUM OREGANUM (Wats.) B. & H. 4. Oregon fairy bells. Not uncommon in open woods, Macleay Park, St. Helens road, etc. April, May; whitish.

CLINTONIA Raf. Clintonia.

CLINTONIA UNIFLORA (Schult.) Kunth. 4. Forest lily. In coniferous woods, Linnton, St. Helens road, Bertha, etc. Formerly in Macleay Park. April to June; white.

TRILLIUM L. Wake robin.

TRILLIUM CHLOROPETALUM (Torr.) Howell. 4. Mottle leaved wake robin. Moist woods, meadows and rill banks, Mt. Scott, Happy Hollow road, Oswego, Oswego lake, etc. April, May; white.

TRILLIUM OVATUM Pursh. 4. Large wake robin. Very common in moist coniferous woods everywhere around Portland and a great favorite with children in early spring. April, May; white.

ASPARAGUS [Tourn.] L. Asparagus.

x ASPARAGUS OFFICINALIS L. 4. Asparagus. An occasional escape from cultivation in waste places, Lower Albina, Macadam road, etc. Introduced from Europe. April to June; green, small.

IXIACEAE Ecklon. Iris Family.

IRIS [Tourn.] L. Flag.

IRIS TENAX Dougl. 4. Purple flag. Very common in fields and roadsides, Portland Heights, East Portland, Mt. Tabor, Mt. Scott, etc. March to May; purple, rarely white.

SISYRINCHIUM L. Blue-eyed grass.

SISYRINCHIUM HESPERIUM Bicknell. 4. Western blue-eyed grass. (*S. bellum* Wats. as to our plant.) Fields and roadsides, East Portland, Happy Hollow road, Fulton, etc.; not uncommon. April, May; purple with yellow center.

SISYRINCHIUM IDAHOENSE Bicknell. 4. Idaho blue-eyed grass. Low ground and grassy meadows near Vancouver. April to June; violet blue with yellow center.

x SISYRINCHIUM BIRAMEUM Piper. 4. Branched blue-eyed grass. Wet meadows and swamps near Vancouver. April to June; dark blue with yellow eye.

ORCHIDACEAE Lindl. Orchid Family.

CYPRIPEDIUM L. Lady's slipper.

CYPRIPEDIUM MONTANUM Dougl. 4. Western lady's slipper. Coniferous woods, Oswego and at old quarry, Park Place. April to June; dull white veined with purple.

CEPHALANTHERA Reich. White orchid.

CEPHALANTHERA AUSTINAE (Gray) Heller. 4. White orchid. (*C. oregana*.) Rare in open woods, Mt. Scott. Formerly on Mt. Tabor. May to July; whole plant white.

EPIPACTIS [Haller] Boehm. Stream orchid.

EPIPACTIS GIGANTEA Dougl. 4. Stream orchid. Infrequent in moist springy places, near mouth of Tualatin river, along Clackamas river between Eagle creek and Estacada, etc. June to Aug.; greenish, prominently veined with purple.

OPHRYS L. Tway blade.

OPHRYS CORDATA L. 4. Heart leaved tway blade. (*Listera cordata*.) Moist coniferous woods near Linnton. May to July; purplish or yellowish.

PERAMIUM Salisb. Rattlesnake plantain.

PERAMIUM DECIPiens (Hook.) Piper. 4. Western rattlesnake plantain. (*P. Menziesii*) Not uncommon in coniferous woods, Macleay Park, St. Helens road, Mt. Tabor, Mt. Scott, etc. July to August; dull white.

IBIDIUM Salisb. Ladies' tresses.

IBIDIUM ROMANZOFFIANUM (Cham.) House. 4. Ladies' tresses. (*Gyrostachys Romanzoffiana*.) Moist or boggy ground above Oswego and on Canyon road near old county poor farm. June to August; white.

CYTHEREA Salisb. Calypso.

CYTHEREA BULBOSA (L.) House. 4. Calypso. (*Calypso borealis*.) In leaf mold and mossy open woods, Macleay Park, east of Gladstone and west of Oswego. The orchid family, which is so generous with its floral offerings in the tropics, and so frugal in the favors bestowed in our section, has compensated us for much in the presence of this handsome little plant in our woods. The showy, rose colored flowers with pinkish lip mottled with madder-purple are not only beautiful in themselves, but the exquisite fragrance which they exhale still further enhances the value of this lovely species. April, May.

PIPERIA Rydb. Orchis.

PIPERIA ELEGANS (Lindl.) Rydb. 4. Forest orchis. (*Habenaria elegans*.) Open woods opposite Oswego. May to July; greenish white.

PIPERIA UNALASCHENSIS (Spreng.) Rydb. 4. Slender orchis. (*Habenaria unalaskensis*.) Dry ridges in coniferous woods near Linton. May to July; greenish white.

LIMNORCHIS Rydb. Bog orchis.

LIMNORCHIS LEUCOSTACHYS (Lindl.) Rydb. 4. Large white bog orchis. (*Habenaria leucostachys*.) Boggy ground near Oswego. May to July; white.

CORALLORHIZA [Haller] R. Br. Coral root.

CORALLORHIZA MACULATA Raf. 4. Large coral root. (*C. multiflora*.) Moist open woods, Mt. Tabor, Mt. Scott, West Portland. May, June; white mottled with purple.

CORALLORHIZA STRIATA Lindl. 4. Striped coral root. Coniferous woods, Mt. Tabor, Mt. Scott, etc. May, June; dark purple with 3 deeper purple lines.

SALICACEAE Lindl. Willow Family.

SALIX [Tourn.] L. Willow.

SALIX LASIANDRA Benth. Western black willow. Stream banks, Ross island. March, April.

SALIX FLUVIATILIS Nutt. Sand bar willow. Not uncommon on moist ground, Ross island, Swan island, below St. Johns, west shore of Sauvie's island, etc. A small tree or frequently a shrub. May, June.

SALIX SESSILIFOLIA Nutt. Western silver willow. Sand bars and stream banks, west shore of Willamette slough near its mouth. Small tree or often a shrub. May, June.

SALIX SCOULERIANA Barratt. Western pussy willow. Hillsides and open woods, Macleay Park, L. & C. fair grounds, Cornell road, etc. One of the earliest blooming of our willows. The aments appear long before the leaves, and are usually in evidence about the first week in January. January to March.

x SALIX SCOULERIANA BRACHYSTACHYS Sargent. Upland willow. Common on hillsides and upland slopes, Barnes road, Cornell road, Portland Heights, etc. The strongest of our local willows. January to March.

x SALIX PIPERI Bebb. Piper's willow. Moist slopes and stream banks, Macleay Park, Milwaukie, etc. In Oregon this willow has for a long time passed as *S. lasiolepis* (white willow), a larger species not yet found north of the California line. March, April.

SALIX SITCHENSIS Sanson. Silky willow. Moist ground and stream banks, St. Helens road, St. Johns, Willamette slough, etc. April, May.

POPULUS [Tourn.] L. Cottonwood; poplar.

POPULUS TRICHOCARPA T. & G. Black cottonwood. Common on east bank of Willamette river between Portland and the golf links; moist ground, Mock's bottom, Swan island, Ross island, etc. March, April.

POPULUS TREMULOIDES Michx. Quaking asp. Infrequent on river bank below Linnton. March, April.

BETULACEAE Agardh. Birch Family.

ALNUS [Tourn.] Hill. Alder.

ALNUS OREGANA Nutt. Oregon alder. Common on moist ground, Macleay Park, L. & C. fair grounds, car shops, Fulton, etc. One of the latest of our native trees to shed its leaves in autumn. The pistillate aments (cones) are not fully mature here till December, and the seeds are usually shed in January, February and March. March, April.

ALNUS TENUIFOLIA Nutt. Mountain alder. Moist ground and stream banks, Rocky Butte and near mouth of Sandy river. April, May.

CORYLUS [Tourn.] L. Hazelnut.

CORYLUS CALIFORNICA (A. DC.) Rose. Western hazelnut. Common on hillsides and open woods everywhere around Portland. February to April.

FAGACEAE Drude. Beech Family.

QUERCUS [Tourn.] L. Oak.

QUERCUS GARRYANA Dougl. Western white oak. Open glades and open fir woods, L. & C. fair grounds, South Portland, Fulton, Oregon City road, etc. The acorns were a staple article of diet among the Indians before the advent of the white man. They were gathered in autumn and sometimes roasted and eaten while fresh, but the usual method was to bury them in sand for a time in order to free them from bitterness. When exhumed they were roasted and found to be quite palatable even to the Caucasian taste. On digging in the old fireplaces on the site of the ancient Indian village below St. Johns, small quantities of these roasted acorns are still occasionally to be found in the ashes where presumably the faithful klooch, with her numerous other duties to attend to had forgotten them. April, May."

URTICACEAE Reichenb. Nettle Family.

URTICA [Tourn.] L. Nettle.

URTICA LYALLII Wats. 4. Lyall's nettle. Alluvial thick

ets and bottom lands, Fulton, St. Helens road, etc. May to October; greenish.

URTICA GRACILIS Ait. 4. Stinging nettle. Waste places and bottom lands, South Portland, Fulton, Sandy boulevard, etc. Common about farm yards and fence rows. May to October; greenish.

x *URTICA BERTEROANA* Philippi. 4. Chile nettle. Infrequent on ballast ground and waste places, Lower Albina. Adventive from Chile. June, July; greenish.

HUMULUS L. Hop

x *HUMULUS LUPULUS* L. 4. Common hop. Occasional on alluvial banks, fence corners and waste places, L. & C. fair grounds, etc. Escaped from cultivation. Introduced from Europe. July, August; fruit September; yellowish.

LORANTHACEAE D. Don. Mistletoe Family.

PHORADENDRON Nutt. Mistletoe.

PHORADENDRON VILLOSUM Nutt. 4. Western mistletoe. Parasitic on *Quercus Garryana*. In early days not uncommon, but now quite rare on oak trees in the vicinity of Portland, owing to its general use for decorative purposes during the Christmas holidays. In recent years wagon loads of this species are annually brought into the city to be sold during the holiday season. In consequence of this it is now practically exterminated in many localities where it was once abundant. Howell's Flora says of this species "berries white." We have never found it so. They are faint pinkish. May, June; greenish white.

SANTALACEAE R. Br. Sandalwood Family.

COMANDRA Nutt. Comandra.

COMANDRA UMBELLATA (L.) Nutt. 4. Kultus berry. Infrequent in open woods, Oswego, Elk Rock, etc. April to June; greenish white or purplish.

ASARACEAE Link. Birthwort Family.

ASARUM [Tourn.] L. Wild ginger.

ASARUM CAUDATUM Lindl. 4. Western wild ginger; nigger babies. Common in moist coniferous woods, Macleay Park, Mt.

Tabor, Mt. Scott, etc. April to June; brown-purple. A handsome plant in our woods, where its brown-purple and green cordate leaves attract attention in spring long before it blooms. The common name "nigger babies" given to it by children in Oregon and Washington is certainly more appropriate to this plant than it is to *Sisyrinchium bellum*, to which it is applied in California, as anyone can readily see who looks at the plant in full bloom, when its purplish-brown flowers and long tailed calyx lobes so strongly remind one of a southern pickaninny in swaddling clothes.

POLYGONACEAE Lindl. Buckwheat Family.

PERSICARIA [Tourne.] L. Dense spiked knotweed.

PERSICARIA OREGANA Greene. 4. Western water knotweed. (*Polygonum amphibium*.) Not uncommon in wet ground, Lower Albina, Mock's bottom, Columbia slough, etc. June to August; rose color.

PERSICARIA EMERSA (Michx.) Small. 4. Swamp knotweed. (*Polygonum Muhlenbergii*.) In shallow water and wet ground, Elk Rock, etc. June to September; rose color.

PERSICARIA LAPATHIFOLIA (L.) S. F. Gray. 1. Pale knotweed. Wet ground, University Park, etc. Naturalized from Europe. June to September; pink to white.

PERSICARIA LAPATHIFOLIA **nodosa** (Pers.) 1. (*Polygonum nodosum* Pers. Syn. 1: 440. 1805.) Wet places, Lower Albina. June to September; pink to white.

PERSICARIA PERSICARIA (L.) Small; 1. Lady's thumb. Moist ground, Lower Albina, Mock's bottom, Columbia slough, Oregon City. Naturalized from Europe. May to September, pink to purple.

PERSICARIA HYDROPIPEROIDES (Michx.) Small. 4. Mild water pepper. Wet places and muddy borders of ponds, Bridgton, Kenton, Oregon City, etc. June to Sept.: pink or greenish.

PERSICARIA HYDROPIPER (L.) Opiz. 1. Smartweed. Moist ground, Mock's Bottom, etc. June to Sept.; mostly greenish.

x PERSICARIA PUNCTATA (Ell.) Small. 4. Dotted smartweed. Wet places, University Park, etc. May to Sept; greenish.

POLYGONUM [Tourn.] L. Knotweed.

POLYGONUM AVICULARE L. 4. Knotgrass; doorweed. Common about door yards and waste places everywhere. Naturalized from Europe. May to October; green with pink border.

POLYGONUM SPERGULARIAEFORME Meisner. 1. Spurry knotweed. Infrequent in sandy places, Lower Albina. May to October; pink with green midveins.

POLYGONUM POLYGALOIDES Meisner 1. Milkwort knotweed. Infrequent in depressions, Tulatin Plains. June to September. White to pinkish.

BILDERDYKIA Dumont.

BILDERDYKIA CONVULVULUS (L.) Dumont. 1. Black bindweed. (*Polygonum Convulvulus* L.) A troublesome weed, not uncommon in cultivated fields, gardens and waste places around Portland. Naturalized from Europe. June to September. Green or whitish.

RUMEX L. Dock, sorrel.

RUMEX ACETOSELLA L. 4. Sheep sorrel. A common weed in fields, roadsides and waste places everywhere. Naturalized from Europe. May to September. Staminate yellowish, pistillate reddish.

RUMEX OCCIDENTALIS Wats. 4. Western dock. Not uncommon in moist woods, Swan island, Ross island, etc. May to September. Rosy red.

RUMEX CRISPUS L. 4. Curly dock. Common in yards, cultivated ground and waste places about Portland. Naturalized from Europe. May to August. Greenish.

x RUMEX MARICOLA Remy. 4. Chile dock. On ballast grounds and waste places, Lower Albina. Adventive from Chile. May to August. Greenish.

RUMEX SALICIFOLIUS Weinm. 4. Willow leaved dock. Infrequent on bottom lands near Milwaukee. May to September. Pink-red.

RUMEX OBTUSIFOLIUS L. 4. Broad leaved dock. On bottom lands, Mock's Bottom and about Vancouver. Naturalized from Europe. May to August. Greenish.

RUMEX MARITIMUS FUEGIANUS (Phil.) Dusen. 1. Coast dock. On sand spits and sandy banks about Columbia Beach, head of Hayden island, etc.; not uncommon. July to October. Pale greenish; fruit reddish.

ERIOGONUM Michx. Eriogonum.

ERIOGONUM COMPOSITUM Dougl. 4. Woolly leaved eriogonum. Infrequent in dry, rocky places, Elk Rock. May to July. Yellow to cream color.

CHENOPODIACEAE Dumort. Goosefoot Family.

CHENOPODIUM [Tourn.] L. Goosefoot.

CHENOPODIUM ALBUM L. 1. Lamb's quarters. A common weed in fields, gardens, roadsides and waste places everywhere. Naturalized from Europe. May to September. Greenish.

x CHENOPODIUM GLAUCUM L. 1. Oak leaved goosefoot. Waste places and sandy banks at head of Hayden island; infrequent. Naturalized from Europe. June to September. Small, greenish.

CHENOPODIUM MURALE L. 1. Nettle leaved goosefoot. Infrequent on ballast grounds and waste places, Lower Albina. Adventive from Europe. June to September. Greenish.

CHENOPODIUM BOTRYS L. 1. Jerusalem oak. Infrequent on stream banks, along Willamette river, about Bridgeton, Columbia Beach, etc. Whole plant viscid and strong scented. Naturalized from Europe. June to September. Greenish.

CHENOPODIUM HUMILE Hook. 1. Low goosefoot. An infrequent, dwarf plant on moist sand spits and sandy banks at the head of Hayden island. June to October. Usually green.

x CHENOPODIUM HASTATUM (*Rhagodia hastata*). 4. Shrubby goosefoot. An introduced evergreen shrubby weed on ballast ground and waste places, Lower Albina. Adventive from Australia. July to September. Greenish.

ROUBIEVA Moq. Goosefoot.

x ROUBIEVA MULTIFIDA (L.) Moq. 4. Cut-leaved goosefoot. On ballast grounds and waste places, Lower Albina. Adventive from Peru or Chile. May to September. Green.

CORISPERMUM [A. Juss.] L. Bug seed.

CORISPERMUM HYSSOPIFOLIUM L. 1. Bug seed. Not un-
common on sand spits and sandy banks at head of Hayden isl-
and. June to September. Small, green or greenish.

SALSOLA L. Russian thistle.

SALSOLA KALI TENUIFOLIA G. W. F. Mey. 1. (*S. Tragus*
of Howell's Flora.) A pernicious weed becoming common in
fields, vacant lots and waste places around Portland, and on sand
spits at the head of Hayden island. Naturalized from Asia. June
to September. Flesh color.

AMARANTHACEAE J. W. St. Hil. Amaranth Family.

AMARANTHUS [Tourn.] L. Pigweed.

AMARANTHUS RETROFLEXUS L. 1. Rough pigweed. A
common weed in gardens, cultivated ground and waste places
everywhere. Naturalized from tropical America. July to Octo-
ber. Green.

AMARANTHUS GRAECIZANS L. 1. Tumble weed. Not un-
common on sand spits and sandy banks at the head of Hayden
island. Naturalized from tropical America. June to September.
Greenish. Some authors believe this plant to be indigenous to
North America. With this opinion we do not concur, and it
certainly is not indigenous in Oregon or Washington.

AIZOACEAE A. Br. Carpet weed Family.

MOLLUGO L. Carpet weed.

MOLLUGO VERTICILLATA L. 1. Carpet weed. On moist
roadsides, sand bars and river banks, Willamette river, Oswego,
Columbia Beach, Hayden island, etc. Naturalized from Mexico
and South America. May to September. White, sepals white
inside.

GALENIA L.

x GALENIA SECUNDA L. One-sided Galenia. Infrequent on
ballast grounds and waste places, Lower Albina. Adventive from
Africa. This weed or ballast waif is now established in most of
the large seaports in the United States. It is placed in Tetra-
goniaceae by some authors. July to September. White.

PORTULACACEAE Reichenb. Purslane Family.

PORTULACA [Tourne.] L. Purslane.

PORTULACA OLERACEA L. 1. Purslane. Not uncommon in low ground, fields, waste places, sand bars and stream banks about Portland, Columbia Beach, Hayden island, etc. June to September. Yellow.

CALANDRINIA H. B. K. Red maids.

x CALANDRINIA CAULESCENS MENZIESII (Hook.) Gray. 1. Red maids. On moist sandy ground at Gillihan's, Sauvie's island. April, May. Rose-red. Flowers sparingly in Portland.

MONTIA [Mich.] L. Miner's lettuce.

MONTIA FONTANA L. 1. Blinking chickweed. (*M. minor.*) In ditches and wet roadsides, East Portland, Fulton, etc. April to June. White.

MONTIA HOWELLII Wats. 1. Howell's Montia. On moist ground, Brooklyn, Fulton, Oswego, Sauvie's island, etc. Blooms early, frequently in February. March to May. Pale pink or white.

MONTIA DICHOTOMA (Nutt.) Howell. 1. Branching Montia. Roadsides and open places, along Barnes road, Springville road, etc. April to June. Pale pinkish or white.

MONTIA LINEARIS (Dougl.) Greene. 1. Linear leaved Montia. Low ground, ditches and roadsides around Portland. April to June. White.

MONTIA DIFFUSA (Nutt.) Greene. 1. Spreading Montia. Common on brules about Portland, Oswego, etc. April to June. White to rose color.

MONTIA PARVIFOLIA (Moq.) Greene. 4. Western miner's lettuce. Moist rocky places, Elk Rock, etc. April to July. White or rose color.

MONTIA HALLII (Gray) Greene. 1. Hall's Montia. Wet ground, Gladstone and southward. This species apparently differs little from *M. fontana*. April to June. White.

MONTIA PERFOLIATA (Donn) Howell. 1. Spanish lettuce. Low ground, particularly under deciduous trees, also on moist roadsides and sloping banks, Mt. Tabor, Barnes road, etc. March to July. Usually white, occasionally pink.

MONTIA PARVIFLORA (Dougl.) Howell. 1. Indian lettuce. Low ground, particularly under deciduous trees, Mt. Tabor, Fulton, Swan island, etc. April to July. Pink or white.

MONTIA RUBRA Howell. 1. Ruby Montia. Under coniferous trees on the Jonathan Moar place, Sauvie's island. April to July. Plant reddish, flowers pink or white.

MONTIA SIBIRICA (L.) Howell. 4. Northern miner's lettuce. Common in moist ground and open woods around Portland. March to June. Pink with five rose-purple lines.

CARYOPHYLLACEAE Reichenb. Pink Family.

TISSA Adans. Sand spurry.

TISSA RUBRA (L.) Britton. 1-4. Sand spurry. Common on roadside lawns and waste places around Portland, Bridgeton, Columbia Beach, etc. May to July. Magenta.

TISSA DIANDRA BRACTEATA (Robinson) Piper. 1. Pink sand spurry. (*T. diandra*.) Rather rare on sandy stream banks near Portland. Much like *T. rubra* but petals are reddish instead of red or magenta. May to July.

SPERGULA L. Spurry.

SPERGULA ARVENSIS L. 1. Corn spurry. Very common in fields, neglected gardens and waste places about Portland. Naturalized from Europe. April to July. White.

SAGINA L. Pearlwort.

SAGINA OCCIDENTALIS Wats. 1. Western pearlwort. (*Alsinnella occidentalis*.) On grassy slopes, Portland Heights, Oswego, etc. May, June. White.

MOEHRINGIA L. Sandwort.

MOEHRINGIA LATERIFLORA (L.) Fenzl. 4. Blunt leaved sandwort. (*Arenaria lateriflora*.) In margin of woods around Portland. May to July. White.

MOEHRINGIA MACROPHYLLA (Hook.) Torr. 4. Broad leaved sandwort. (*Arenaria macrophylla*.) In coniferous woods, King's Heights, Macleay Park, Mt. Tabor, etc. May to July. White.

ARENARIA L. Sandwort.

ARENARIA SERPYLLIFOLIA L. 1. Thyme leaved sandwort.

Common in fields and roadsides around Portland. Naturalized from Europe. April to July. White.

ARENARIA SERPYLLIFOLIA TENUIOR Koch. 1. Small flowered sandwort. In fields, roadsides and waste places about the city. Naturalized from Europe. April to July. White.

ALSINE L. Chickweed.

ALSINE MEDIA L. 1. Chickweed. Very common weed in fields, gardens, lawns and waste places about the city. Blooms early (about February 1st) and continues all summer. Naturalized from Europe. White.

ALSINE NITENS (Nutt.) Greene. 1. Slender starwort. Moist ground, Swan island and Ross island. April to July. White.

ALSINE LONGIFOLIA (Muhl.) Britton. 1. Long leaved stitchwort. In moist places about Oswego. April to July. White.

ALSINE BOREALIS (Bigel.) Britton. 4. Northern chickweed. Low ground and bottom lands, Columbia and Willamette rivers near Portland. May to July. White.

ALSINE CRISPA (C. & S.) Holzinger. 4. Crisp leaved chickweed. Rare in moist rich woods about the city. May to July. White.

x *ALSINE AQUATICA* (L.) Britton. 4. Water chickweed. Infrequent in wet ground and waste places, Lower Albina. Adventive from Europe. April to July. White.

CERASTIUM L. Mouse-ear chickweed.

CERASTIUM VISCOSUM L. 1. Mouse-ear chickweed. Common in gardens and cultivated ground. Naturalized from Europe. March to July. White.

CERASTIUM VULGATUM L. 4. Large mouse-ear chickweed. Common on roadsides and waste places. Naturalized from Europe. April to August. White.

CERASTIUM ARVENSE L. 4. Field chickweed. Infrequent in low ground and waste places. April to August. White.

CERASTIUM ARVENSE ANGUSTIFOLIUM Fenzl. 4. Narrow leaved chickweed. On rocky slopes, Elk Rock. April to August. White.

AGROSTEMMA L. Corn cockle.

AGROSTEMMA GITHAGO L. 1. Corn cockle. Cultivated fields about Portland, Milwaukie and Vancouver. Introduced from Europe. June to September. Dull red or purplish.

LYCHNIS [Tourne.] L. Cockle.

LYCHNIS CORONARIA (L.) Desr. 4. Mullein pink. Cultivated fields and waste places about the city. Introduced from Europe. June to September. Light crimson.

SILENE L. Catchfly.

SILENE ANGLICA L. 1. English catchfly. (*S. gallica*.) Ballast grounds and waste places, Lower Albina; rather rare. Adventive from Europe. April to July. White.

SILENE ANTIRRHINA L. 1. Sleepy catchfly. Infrequent on rocky slopes, Elk Rock. May to September. Pink.

SILENE COLUMBIANA Howell. 4. Bell-flowered campion. On rocky banks along Willamette river. May to August. White or pale pink.

SILENE SCOULERI Hook. 4. Scouler's campion. On moist brushy ground, Jonathan Moar place, Sauvie's island. May to July. White or pink.

ANOTITES Greene. Catchfly, campion.

ANOTITES MENZIESII (Hook.) Greene. 4. Menzies' campion. On Rock island and other islands in the Willamette river above Milwaukie. May to August. White or pale pink.

SAPONARIA L. Soapwort.

SAPONARIA OFFICINALIS L. 4. Soapwort. Railroad tracks and roadsides about the city. Naturalized from Europe. June to September. White or pink.

SAPONARIA VACCARIA L. 1. Cow-herb. Infrequent in fields and waste places about the city. Naturalized from Europe. June to August. Pale red.

GYPSOPHILA L. Pink.

GYPSOPHILA MURALIS L. 1. Low Gypsophila, German pink. Reported to us from roadsides and waste places. Lower Albina; specimen not seen. Naturalized from Europe. May to August. Purplish.

DIANTHUS L. Pink, carnation.

x DIANTHUS ARMERIA L. 1. Deptford pink. Infrequent in fields and roadsides, Mt. Tabor, near Lents, etc. Adventive from Europe. May to August. Pink with whitish dots.

x DIANTHUS BARBATUS L. 4. Sweet William. Garden escape infrequent in fields and waste places. Introduced from Europe. May to August. Pink or whitish.

PARONYCHIA [Tourn.] Adans. Whitlow-wort.

x PARONYCHIA CHILENSIS DC. 4. Chile Whitlow-wort. Prostrate, perennial weed, not uncommon on ballast grounds, roadsides and waste places, Lower Albina, Vancouver, etc. Introduced from Chile. May to July. White.

NYMPHAEACEAE DC. Water Lily Family.

BRASENIA Schreb. Water shield.

BRASENIA SCHREBERI Gmel. 4. Water shield. In ponds, Sauvie's island. June to August. Dull purple.

NYMPHAEA [Tourn.] L. Water lily.

NYMPHAEA POLYSEPALA (Engelm.) Greene. 4. Western pond lily. Common in ponds, The Oaks, Sellwood, Oak Grove, Oswego lake, etc. May to September. Yellow.

CERATOPHYLLACEAE Gray. Hornwort Family.

CERATOPHYLLUM L. Hornwort.

CERATOPHYLLUM DEMERSUM L. 4. Hornwort. In ponds, East Portland, etc. May to July. Greenish, minute.

RANUNCULACEAE Jussieu. Buttercup Family.

RANUNCULUS [Tourn.] L. Buttercup.

RANUNCULUS REPTANS L. 4. Creeping spearwort. Swales and wet places, Oswego, etc. May to July. Glossy yellow, small.

RANUNCULUS UNALASCHENSIS Besser. 4. Trailing buttercup. Rather rare in wet places about Portland. June to August. Glossy yellow, small.

RANUNCULUS BOLANDERI Greene. 4. Bolander's buttercup.

Swales, wet places and rill banks, Oswego lake and near Forest Grove. Not uncommon in Tualatin valley. May to July. Glossy yellow.

RANUNCULUS SCALERATUS L. 1. Ditch buttercup. (*R. eremogencs.*) Borders of aestival-receding ponds near Columbia Beach; infrequent. June to September. Small, pale glossy yellow.

RANUNCULUS OCCIDENTALIS Nutt. 4. Western buttercup. On dry ridges, Burnes road, Cornell road, etc. April to June. Glossy yellow, showy.

RANUNCULUS GREENEI Howell. 4. Woodland buttercup. In coniferous woods, Goldsmith's Addition, Council Crest, etc. April, May. Pale glossy yellow, small.

RANUNCULUS BONGARDI Greene. 4. Bongard's buttercup. (*R. Douglasii.*) Common in moist copses and along stream banks, Fulton, Oswego, Swan island, etc. April, May. Pale glossy yellow, small.

RANUNCULUS OREGANUS (Gray) Howell. 4. Oregon buttercup. Moist ground, Swan island, Ross island, etc. March to May. Glossy yellow.

RANUNCULUS REPENS L. 4. Creeping buttercup. Common in moist lawns, vacant lots and roadsides throughout Portland. In ours the leaves are blotched or spotted with pale green. Naturalized from Europe. April to June. Glossy yellow.

RANUNCULUS ORTHORHYNCHUS Hook. 4. Purple-back buttercup. In wet places, North Portland, Fulton, Oswego, St. Helens road, etc. April, May. Glossy yellow, purple outside.

RANUNCULUS MURICATUS L. 1. Spiny fruited buttercup. Rather rare in ditches and wet places about the city. Naturalized from Europe. Does not appear to spread rapidly here. May to July. Glossy yellow.

RANUNCULUS CYMBALARIA Pursh. 4. Sessile crowfoot. Infrequent on borders of ponds near Columbia Beach and about the head of Hayden island. June to September. Small, glossy yellow.

BATRACHIUM S. F. Gray. Water crowfoot.

BATRACHIUM TRICHOPHYLLUM (Chaix.) Bossch. 4. White water crowfoot. In ponds and ditches about the city. May to September. White.

TRAUTVETTERIA F. & M. False bugbane.

TRAUTVETTERIA GRANDIS Nutt. 4. Western false bugbane. On stream banks, Multnomah falls and westward. May to July. White, small, apetalous.

MYOSURUS [Dill.] L. Mousetail.

MYOSURUS LEPTURUS (Gray) Howell. 1. Large mousetail. Fields, roadsides and moist places, Swan island, Ross island, Oak Grove, etc. April to July. Greenish, minute.

THALICTRUM [Tourn.] L. Meadow rue.

THALICTRUM OCCIDENTALE Gray. 4. Western meadow rue. Wet boggy ground, Happy Hollow road near Lents. April to June. Greenish white.

ANEMONE [Tourn.] L. Anemone, windflower.

ANEMONE DELTOIDEA Hook. 4. Deltoid anemone. In coniferous woods, Barnes road, King's Heights, Portland Heights, etc.; not uncommon. April to June. White.

ANEMONE OREGANA Gray. 4. Oregon windflower. In open woods near Milwaukie. April to June. Blue to lavender rarely white.

CLEMATIS L. Virgin's bower.

CLEMATIS LIGUSTICIFOLIA Nutt. 4. Western virgin's bower. On rocky banks near Oswego and along Tualatin river. May to August. White.

AQUILEGIA [Tourn.] L. Columbine.

AQUILEGIA FORMOSA Fisch. 4. Western columbine. Open woods, Council Crest, Rocky Butte, Sandy Boulevard, etc. Yellow inside. This species has the greatest vertical range of all plants in the present list, being found from sea level in the vicinity of Portland, to 7000 feet altitude in the Cascade mountains, southern Oregon.

DELPHINIUM [Tourn.] L. Larkspur.

x *DELPHINIUM CONSOLIDA* L. 1. Field larkspur. Infrequent in vacant lots and waste places, 20th and Overton streets and elsewhere about the city. Adventive from Europe. May to July. Blue or pink to white.

DELPHINIUM OREGANUM Howell. 4. Oregon larkspur. On rocky ground, Oswego. May, June. Blue.

DELPHINIUM LEUCOPHAEUM Greene. 4. White larkspur. On rocky slopes, Elk Rock and Oswego. May, June. Whitish, yellowish outside.

DELPHINIUM TROLLIIFOLIUM Gray. 4. Poison larkspur. On moist ground, fields and under maple trees, East Portland, Mt. Tabor, etc. April to June. Blue.

CIMICIFUGA L. Bugbane.

CIMICIFUGA ELATA Nutt. 4. Western bugbane. In coniferous woods, Mt. Scott, Linnton, etc. May, June. White, small.

ACTAEA L. Baneberry.

ACTAEA ARGUTA Nutt. 4. Western baneberry. In coniferous woods, Macleay park, Council crest, St. Helens road, etc. May, June. White, small.

BERBERIDACEAE T. & G. Barberry Family.

BERBERIS [Tourne.] L. Barberry.

BERBERIS AQUIFOLIUM Pursh. Oregon grape. On open rocky ridges, Mt. Tabor, Rocky Butte, along Tualatin river, etc. Not nearly so common as the following species. The largest specimen we have yet seen in Oregon is 5 inches in diameter by 16 feet high. March to May. Yellow.

BERBERIS NERVOSA Pursh. Low Oregon grape. Common in open coniferous woods everywhere around Portland. So largely are these two species now used for holiday and festive decorations of all kinds, that they are practically threatened with extermination in this vicinity. March to May. Yellow.

VANCOUVERIA Morr. & Dec. Barrenwort.

VANCOUVERIA HEXANDRA Morr. & Dec. 4. Barrenwort. Common in coniferous woods, Barnes road, Cornell road, Macleay Park, Mt. Tabor, etc. Generally known among children as "umbrella flower." April, May. Pearly white.

ACHLYS DC. Vanilla leaf.

ACHLYS TRIPHYLLA (Smith.) DC. 4. Vanilla leaf. Common in open coniferous woods, Macleay Park, Mt. Tabor, Portland Heights, St. Helens road, etc. Large quantities of the stems and leaves are gathered in spring and hung about rooms, shops, etc. for the fragrance exhaled by the leaves on drying.

This fragrance is due to the presence of Coumarin, a principle that is also contained in other species such as *Melilotus alba*, *Dipterix odorata*, etc. Were it generally known that any long continued inhalation of this odor is injurious, the practice of hanging up the leaves in bedrooms would undoubtedly be stopped. April to June. White, small.

PAPAVERACEAE Endl. Poppy Family.

ESCHSCHOLTZIA Cham. Western poppy.

ESCHSCHOLTZIA DOUGLASII Benth. 4. Douglas' poppy. Open glades near Gladstone. May, June. Bright yellow.

x ESCHSCHOLTZIA CALIFORNICA Cham. 4. California poppy. Vacant lots and waste places, Goldsmith's Addition, East Portland, etc. Introduced from California. May, June. Orange to yellow or yellow with orange center.

PAPAVER [Tourn.] L. Poppy.

x PAPAVER RHOEAS L. 1. Field poppy. Ballast grounds and waste places, Lower Albina. Adventive from Europe. May to July. Scarlet.

FUMARIACEAE DC. Fumitory Family.

BIKUKULLA Adans. Bleeding heart.

BIKUKULLA FORMOSA (Andr.) Coville. 4. Western bleeding heart. Moist ground and stream banks, Balch creek, St. Helens road, etc. April to June. Rose-purple.

BRASSICACEAE Lindl. Mustard Family.

BRASSICA [Tourn.] L. Mustard.

BRASSICA NIGRA (L.) Koch. 1. Black mustard. Common in fields and waste places around Portland. Naturalized from Europe. May to October. Yellow.

BRASSICA CAMPESTRIS L. 1. Wild turnip. Common in fields, vacant lots and waste places about the city. Introduced from Europe. April to October. Pale yellow.

x BRASSICA ALBA (L.) Boiss. 2. White mustard. Fields, roadsides and waste places about the city. Introduced from Europe. May to October. Yellow.

x BRASSICA ARVENSIS (L.) B. S. P. 1. Charlock. Noxious

weed in fields, vacant lots and waste places everywhere about the city. Naturalized from Europe. April to October. Yellow.

SISYMBRIUM [Tourn.] L. Hedge mustard.

SISYMBRIUM OFFICINALE (L.) Scop. 2. Hedge mustard. (*Erysimum officinale*) Common in fields and waste places around Portland. Naturalized from Europe. April to October. Small, yellow.

x SISYMBRIUM OFFICINALE LEOCARPUM DC. 2. Smooth podded mustard. Common weed in fields and waste places around Portland. Naturalized from Europe. April to October. Yellow.

x SISYMBRIUM THALIANUM (L.) Gray. 1. Mouse-ear cress. Common in fields and moist sandy and rocky places, Oak Grove, etc. Naturalized from Europe. April to June. White.

x SISYMBRIUM ALTISSIMUM L. 1-2. Tumbling mustard. Recent and undesirable immigrant in dry sandy waste places and along railroad tracks, East Portland. Infrequent here as yet. Commonly known in the northwest as "Jim Hill mustard." Adventive from Europe. April to June. Pale yellow.

DRABA [Dill.] L. Whitlow grass.

DRABA VERNA L. 1. Vernal whitlow grass. (*Erophila vulgaris*) Infrequent but locally abundant on moist sandy slopes, roadsides and waste places, Sandy Boulevard, Hemlock station, Vancouver, etc. Naturalized from Europe. March, April. White.

DRABA LEOCARPA Lindl. 1. Slender whitlow grass. (*D. lutea*.) On sandy banks, Willamette river near Oswego. May to July. Yellow.

CARDAMINE [Tourn.] L. Bitter cress.

CARDAMINE ANGULATA Hook. 4. Angular leaved cress. In moist woods, Balch creek and near Linnton. April to June. White.

CARDAMINE OCCIDENTALIS (Wats.) Howell. 4. Western bitter cress. Wet places, Lower Albina, Milwaukie, Sauvie's island, etc. April to June. White.

CARDAMINE PRATENSIS L. 4. Meadow bitter cress. Shallow ponds and wet places near Milwaukie. April, May. White.

CARDAMINE OLIGOSPERMA Nutt. 1. Annual cress. Under coniferous trees, Macleay Park, Mt. Tabor, etc. April to June. White.

DENTARIA [Tourn.] L. Toothwort.

DENTARIA TENELLA Pursh. 4. Small toothwort. Common in open woods in early spring, Macleay Park, Cornell road, Mt. Tabor, Mt. Scott, Sellwood, etc. March to May. Rose-purple.

ARABIS L. Rock cress.

ARABIS HIRSUTA (L.) Scop. 2. Hairy rock cress. Base of rocky cliffs, Elk Rock, April to August. White.

ARABIS PERFOLIATA Lam. 2. Tower mustard. On dry ridges and rocky places near Oswego. April to July. Whitish.

CAMPE Dulac. Winter cress.

CAMPE AMERICANA Rydb. 4. Western yellow rocket. (*Barbarea vulgaris*.) Common in fields and along stream banks about the city. April to June. Bright yellow.

RADICULA [Dill.] Hill. Cress.

RADICULA PALUSTRIS (L.) Moench. 2. Yellow water cress. (*Roripa palustris*.) Wet places and stream banks, Swan island, Sauvie's island, etc. April to July. Yellow.

RADICULA PACIFICA (Howell) Greene. 1-2. Western yellow cress. (*Roripa pacifica*.) On alluvial soil, Sauvie's island. April to June. Yellow.

RADICULA CURVISILIQUA (Hook.) Greene. 1-2. Curved fruited cress. (*Roripa curvisiliqua*.) Stream banks, Fulton, Oswego, Oregon City, etc. April to June. Yellow.

x RADICULA INDICA (DC.) 2. East Indian cress. Ballast grounds and waste places, Lower Albina. Adventive from India. May to July. Yellow.

RADICULA NASTURTIUM-AQUATICA (L.) Britten & Rendle. 4. Water cress. (*Nasturtium officinale*.) Common in running water, ditches, and about springs, East Portland, South Portland, Goldsmith's Addition, etc. Largely used as greens and occasionally cultivated. Naturalized from Europe. April to October. White.

CHEIRANTHUS L. Wall flower.

CHEIRANTHUS ELATUS (Nutt.) Greene. 4. Tall wall flower. On rocky cliffs and sandy slopes, Macleay Park, South Portland, Elk Rock. April to July. Yellow or orange.

BURSA Weber. Shepherd's purse.

BURSA BURSA-PASTORIS (L.) Weber. 1. Shepherd's purse. Common weed in fields, lawns, roadsides and waste places everywhere. Naturalized from Europe. Feb. to Nov. White.

CORONOPUS Gaertn. Wart cress.

CORONOPUS DIDYMUS (L.) J. E. Smith. 1-2. Lesser wart cress. In ditches and moist waste places, East Portland, Lower Albina. Naturalized from Europe. May to July. Minute, greenish-white.

x CORONOPUS PROCUMBENS Gilib. 1-2. Swine cress. Infrequent on ballast grounds and waste places. Lower Albina, East Portland, etc. Not nearly so much inclined to spread or become a weed as is the preceding species. Adventive from Europe. May to August. Greenish-white, minute.

LEPIDIDIUM [Tourn.] L. Pepper grass.

LEPIDIDIUM MEDIUM Greene. 1. Round podded pepper grass. Hillsides and sandy places, Sandy Boulevard. May to July. White.

LEPIDIDIUM APETALUM Willd. 1. Roadside pepper grass. Dry sandy slopes, Sandy Boulevard. May to July. Greenish-white.

THLASPI [Tourn.] L. Penny cress.

x THLASPI ARVENSE L. 1. Field penny cress. In fields and waste places about the city. Frequently known as "French-weed" by farmers. Naturalized from Europe. May to July. White.

ATHYSANUS Greene. Hairy pod.

ATHYSANUS PUSILLUS (Hook.) Greene. 1. Hairy pod. Infrequent in rocky places, Elk Rock and near Oswego. March, April. White.

RAPHANUS [Tourn.] L. Radish.

RAPHANUS SATIVUS L. 2. Radish. In fields, roadsides and waste places around Portland. Introduced from Europe, but native of China. April to October. Purple, pink or white.

RESEDACEAE S. F. Gray. Mignonette Family.

RESEDA [Tourn.] L. Mignonette.

x RESEDA LUTEOLA L. 1. Dyer's weed. Ballast grounds and waste places, Lower Albina. Adventive from Europe. May to July. Greenish-yellow.

x RESEDA LUTEA L. 2. Yellow Mignonette. Ballast grounds and waste places, Lower Albina. Adventive from Europe. May to July. Pale yellow.

CRASSULACEAE DC. Stonecrop Family.

TILLAEA [Micheli.] L. Pigmy weed.

TILLAEA AQUATICA L. 1. Mud-bank pigmy weed. (*T. angustifolia*.) Moist ground, Sauvie's island. June to September. Greenish-white, minute.

SEDUM [Tourn.] L. Stonecrop.

SEDUM SPATHULIFOLIUM Hook. 4. Mealy stonecrop. On moist rocks, Elk Rock. May to July. Yellow.

SEDUM DOUGLASII Hook. 4. Douglas' stonecrop. Rocky ridges near Oswego and Rocky Point. May to July. Yellow.

SEDUM UNIFLORUM Howell. 4. One-flowered stonecrop. On rocks, north end of Elk Rock. May to July. Yellow.

GORMANIA Britton. Stonecrop.

GORMANIA OREGANA (Nutt.) Britton. 4. Oregon stonecrop. (*Sedum oreganum*.) On rocky places, Rocky Butte. May to July. Yellow.

SAXIFRAGACEAE Dumort. Saxifrage Family.

SAXIFRAGA [Tourn.] L. Saxifrage.

SAXIFRAGA MERTENSIANA Bong. 4. Mertens' Saxifrage. On wet rocks, Elk Rock. April to June. White.

SAXIFRAGA INTEGRIFOLIA Hook. 4. Entire-leaved Saxifrage. Wet places, Oswego, etc. April to June. White.

SAXIFRAGA OCCIDENTALIS Wats. 1. Thick leaved Saxifrage. On rocky cliffs, Elk Rock. April to June. White.

SAXIFRAGA NUTTALLII (Nutt.) Small. 1. Nuttall's Saxifrage. On wet rocks, Elk Rock, Oregon City, etc. April to June. White.

SULLIVANTIA T. & G. Cliff Saxifrage.

SULLIVANTIA OREGANA Wats. 4. Oregon Sullivantia. On cliffs, Elk Rock. May to July. White.

THEROFON Raf. Water Saxifrage.

THEROFON ELATUM (Nutt.) Greene. 4. Creek bank Saxifrage. (*Boykinia occidentalis*.) Moist creek banks, St. Helens road near Linnton. May to July. White.

BOLANDRA Gray. Rock Saxifrage.

BOLANDRA OREGANA Wats. 4. Northern Bolandra. On cliffs, Elk Rock. May to July. Dark purple.

LEPTAXIS Raf. Bud-leaf.

LEPTAXIS MENZIESII Raf. 4. Bud-leaf mitrewort. Moist woods and creek banks, Macleay Park, St. Helens road, etc. April to June. Brown.

TELLIMA R. Br. Fringe cup.

TELLIMA GRANDIFLORA (Pursh) Dougl. 4. Western Bishop's cap. Common in moist open woods, Elk Rock, Oswego, Milwaukie, Rocky Butte, etc. April to June. Greenish-white, changing to pink or red.

LITHOPHRAGMA Nutt. Fringed Saxifrage.

LITHOPHRAGMA PARVIFLORA Nutt. 4. Woodland Saxifrage. Rocky places and open woods, Oswego, etc. April to June. White or pinkish.

MITELLA [Tourn.] L. Bishop's cap.

MITELLA CAULESCENS Nutt. 4. Rough mitrewort. On creek banks, Balch creek and St. Helen's road. April to June. Greenish.

TIARELLA L. Coolwort.

TIARELLA TRIFOLIATA L. 4. Hairy false mitrewort. Moist coniferous woods, Macleay Park, St. Helens road, etc. April to June. White.

HEUCHERA L. Alum root.

HEUCHERA MICRANTHA Dougl. 4. Western alum root. In rocky places, Elk Rock, Oswego, Mt. Tabor, Rocky Butte, etc. April to June. White, small.

HEUCHERA CYLINDRICA Dougl. 4. Tall Heuchera. In moist rocky places, Oswego, etc. April to June. Yellowish.

CHRYSOSPLENIUM [Tourn.] L. Golden Saxifrage.

CHRYSOSPLENIUM SCOULEI (Hook.) Rose. 1. Pacific golden Saxifrage. (*C. glechomæfolium.*) Creek banks and wet places near Linnton. May to July. Yellowish-green.

HYDRANGEACEAE Dumort. Hydrangea Family.

PHILADELPHUS L. Mock orange, Syringa.

PHILADELPHUS GORDONIANUS Lindl. Western Syringa. (*P. Lewisii.*) Open woods, Portland Heights, head of Jefferson street, Cornell road, Mt. Tabor, etc. Frequently used as an ornamental shrub in private grounds. The flowers, which appear in late May and June, have a delicate, melleous odor that is faintly but sweetly fragrant, and may be noticed even at a distance of one hundred yards to leeward of a clump of this species. May to July. White.

WHIPPLEA Torr. Trailers.

WHIPPLEA MODESTA Torr. 4. Trailers. Infrequent in forests near Linnton. May to July. White.

GROSSULARIACEAE Dumort. Gooseberry Family.

RIBES L. Currant, gooseberry.

RIBES SANGUINEUM Pursh. Red flowered currant. Common on hillsides and in open woods everywhere around Portland. Well worthy of cultivation on account of its showy flowers and frequently used as an ornamental shrub in private grounds. The handsome rose-pink to red flowers can be found from early in March to June 1st according to elevation. The appearance of the flowers, at least in this section, no matter how early in the season, is immediately followed by the advent of the humming birds, who promptly visit the attractive blossoms, apparently not alone for the nectar contained, but also to feast on the numerous small insects that so readily visit the flowers for the same purpose. The flowers, especially when bruised or crushed, emit a heavy balsamic odor that is not altogether pleasant. The fruit, which at first glance appears to be glaucous-blue, is in reality black with a dense white bloom, and so insipid that it has long

been considered worthless, but close observation during the past seven years shows that it is relished by robins and is occasionally eaten by flickers and chipmunks. Of all our native wild flowers this beautiful shrub suffers most at the hands of the low, ignorant and vicious individuals with which all our cities are infested. It is a conservative statement to make, that at the end of its flowering season scarcely a bush of it has escaped unscathed, where it has been accessible to the idle Sunday rabble. And it is not at all surprising that handsome specimens of it that have been transplanted into private grounds, have been ruthlessly broken and damaged by these sneaking vandals, when even the graves of our dead are continuously despoiled of the floral decorations that loving friends have contributed to their memory. Rose-pink to red.

✓ **RIBES SANGUINEUM album.** At intervals during the past 30 years a rare form of *R. sanguineum* with pure white flowers has been found on the hillsides around Portland (Westover Terraces, Macleay Park and East Portland). As no intergrades have been seen, and as the specimens which we have observed in cultivation have remained true to type, the variety may be considered permanent. March to May. White.

— **RIBES BRACTEOSUM** Dougl. Stink currant, large leaved currant. Moist stream banks, Balch creek and creeks along St. Helens road. April to June. Greenish-white.

RIBES DIVARICATUM Dougl. Western wild gooseberry. On low ground along the Willamette river near Portland, Sauvie's island, etc. April, May. Calyx purplish or greenish-white, petals white.

RIBES LOBBII Gray. Lobb's gooseberry. Open woods, South Portland, Oswego, etc. Handsome species with dark purple flowers, occasionally cultivated but quite difficult to transplant. March to May. Sepals dark purple, petals white.

ROSACEAE B. Juss. Rose Family.

ROSA [Tourn.] L. Rose.

ROSA NUTKANA Presl. Western wild rose. Old fields, roadsides and open places, St. Helens road, South Portland, Oswego,

etc.; fairly common. May, June. Pink with whitish center.

ROSA PISOCARPA Gray. Woodland rose. Small flowered but sweetly fragrant species, common in low ground, open woods, vacant lots and waste places, Raleigh street, Cornell road, Albina, East Portland, etc. May, June. Deep pink, small.

ROSA CALIFORNICA C. & S. California rose. Infrequent in margin of woods, Canyon road, Cornell road, Fulton, East Portland, etc. May, June. Pink.

ROSA GYMNOCARPA Nutt. Forest rose. Common in open woods and roadsides, Canyon road, Cornell road, etc. May, June. Bright pink.

ROSA RUBIGINOSA L. Sweetbrier. Very common in old pastures, vacant lots and waste places, Fulton, Oswego, East Portland, etc. The seed capsules are relished by horses and cattle, a fact which no doubt accounts for its rapid spread in certain localities. Naturalized from Europe. May, June. Pink.

SANGUISORBA [Rupp.] L. Burnet.

SANGUISORBA ANNUA Nutt. 1. Annual burnet. Not uncommon in fields and waste places, Milwaukie, Risley station, etc. To some extent a native weed. May to July. Greenish-white.

ALCHEMILLA L. Lady's mantle.

ALCHEMILLA OCCIDENTALIS Nutt. 1. Western lady's mantle. (*A. arvensis*.) Common in fields and waste places about the city. April to August. Greenish.

GEUM L. Avens.

GEUM MACROPHYLLUM Willd. 4. Large leaved avens. Common in open woods and waste places, Cornell road, South Portland, Lower Albina, Mt. Tabor, etc. April to July. Yellow.

FRAGARIA [Tourn.] L. Strawberry.

FRAGARIA CUNEIFOLIA Nutt. 4. Wild strawberry. Common on grassy hillsides and open places, Portland Heights, Buckman's Addition, etc. March to June. White.

FRAGARIA CALIFORNICA C. & S. 4. Wood strawberry. Common on grassy slopes, glades and open places, Portland Heights, Willamette Heights, Mt. Tabor, etc. March to June. White.

COMARUM L. Marsh cinquefoil.

COMARUM PALUSTRE L. 4. Marsh cinquefoil. In marshy ponds, Sauvie's island. May to July. Dark purple.

DRYMOCALLIS Fourr. Cinquefoil.

DRYMOCALLIS GLANDULOSA (Lindl.) Rydb. 4. Glandular cinquefoil. (*Potentilla glandulosa*.) Open woods, Oswego, Milwaukee, etc. May, June. Yellow.

POTENTILLA L. Cinquefoil, five-finger.

POTENTILLA RIVALIS Nutt. 1-2. Slender cinquefoil. Infrequent in moist places around Portland. May to July. Yellow, small.

POTENTILLA MILLEGRANA Engelm. 1-2. Branched cinquefoil. Infrequent on sandy banks, Willamette river near Portland. May to July. Yellow.

POTENTILLA GRACILIS Dougl. 4. Western five-finger. In glades near Linnton, Mt. Scott, etc. May to July. Yellow.

ARGENTINA Lam. Silverweed.

ARGENTINA ANSERINA (L.) Rydb. 4. Silverweed. Infrequent on stream banks, Willamette river near Portland. The roots were formerly eaten by the Indians. April to Aug. Yellow.

RUBUS [Tourn.] L. Blackberry, raspberry.

RUBUS PARVIFLORUS Nutt. Red thimble berry. Common in open woods, Macleay Park, South Portland, Logie trail, etc. April to June. White.

RUBUS SPECTABILIS Pursh. Salmon berry. Common in moist woods and stream banks, Balch creek, Ross island, St. Helens road, etc. The fruit of this species in the immediate vicinity of Portland is usually dull yellow, but occasionally red. Two miles east of Cazadero, however, a form occurs that has black fruit when fully ripe. April to June. Red.

RUBUS LEUCODERMIS Dougl. Western black-cap. Common in open woods, Macleay Park, Canyon road, Cornell road, etc. April, May. White.

RUBUS URSINUS C. & S. Wild blackberry. Very common in coniferous woods everywhere around Portland. It also can

frequently be found covering cut or sloping banks on the various roads and even on city streets, as may be seen at 24th and Quimby streets. Almost an evergreen in this section, and southward at low elevations. April, May. White.

RUBUS LACINIATUS Willd. Evergreen blackberry. Common in fence corners, vacant lots, waste places and roadsides about Portland; corner Stout and Yamhill streets, Vista avenue near Washington street, southeast corner Union avenue and East Main street, etc. The petals in ours are white usually with a faint pink tinge, and are three-lobed at the apex. Contrary to local opinion, the fruit is quite edible and of good flavor when not allowed to become too ripe. Generally believed to be native of Europe, possibly a form of *R. fruticosus* (a species much given to variegation) but introduced about Portland, Oregon City and Vancouver from the Sandwich islands in the 40s. April to August. Faint pink to white. //

SERICOTHECA Raf. Ocean spray.

SERICOTHECA DISCOLOR (Pursh) Rydb. Small ocean spray. (*Holodiscus discolor*.) Common in open coniferous woods about Portland. This shrub shows great liability to fasciation in our woods. May, June. Cream white to tawny.

SERICOTHECA FRANCISCANA Rydb. Arrow-wood, large ocean spray. (*Holodiscus ariaefolia*.) Common in open woods, Macleay Park, L. & C. fair grounds, Mt. Tabor, Barnes road, Canyon road, etc. A specimen of this shrub seen on Gale's Peak measured 2½ inches in diameter. This and the preceding are generally regarded as one species under the name *discolor*. May, June. Cream-white to tawny;

OPULASTER Medic. Nine bark.

OPULASTER OPULIFOLIUS (L.) Kuntze. Nine bark. Open woods, Fulton, Oswego, Milwaukie, and in vacant lots southeast corner 23d and Quimby streets. Occasionally cultivated in private grounds about the city as an ornamental shrub. May, June. White.

SPIRAEA [Tourn.] L. Spiraea.

SPIRAEA LUCIDA Dougl. Low Spiraea. Open woods, Barnes road and Canyon road. May, June. White.

SPIRAEA PYRAMIDATA Greene. Pyramidal spiraea. Infrequent on rocky ridges near the old Strong place, Riverside. May, June. White to rose color.

SPIRAEA DOUGLASII Hook. Coast hardhack. Common in low ground, Laurelhurst Park, St. Helens road, Slavin road, etc. The handsome rose-colored flowers of this shrub continue in bloom during a great part of summer, and fully entitle it to cultivation, but so far it has only occasionally been planted in private grounds in this city. May to September. Deep rose color.

ARUNCUS (L.) Adans. Goat's beard.

ARUNCUS VULGARIS Raf. 4. Goat's beard. Common on stream banks and in moist open woods, Balch creek, St. Helens road, Fulton, and elsewhere around Portland. April to June. White to cream color, fading tawny.

MALACEAE Small. Apple Family.

MALUS [Tourn.] Hill. Apple.

MALUS DIVERSIFOLIA (Bong.) Roem. Oregon crab apple. (*M. rivularis*.) Stream banks and open woods, Swan island, Ross island, Fulton, Oswego, Oak Grove, etc. Our tree usually sheds the calyx about the time the fruit is fully formed, rarely retaining it until autumn. The flowers bloom about a week later than those of the western service berry, but 10 days earlier than the western haw, while the fruit is not ripe till a full month later than that of the latter, or about the first week in September. April, May. White, anthers cream color.

CRATAEGUS L. Hawthorne.

CRATAEGUS DOUGLASII Lindl. Western haw. On moist ground and stream banks, Vancouver ferry landing, Fulton, Oswego, Oak Grove, etc. This species blooms about the same time as the woolly bitter cherry. April, May. White, anthers red-pink.

AMELANCHIER Medic. Service berry.

AMELANCHIER ALNIFOLIA Nutt. Western service berry. Open woods, Balch creek, Mt. Tabor, Cornell road, St. Helens road, etc. Though usually a shrub, this species occasionally becomes a tree. A specimen found by the writer in the lower Wil-

lamette valley measured $9\frac{1}{2}$ inches in diameter by 36 feet high. It frequently blooms again in autumn, but not so profusely as in spring. The fruit is a great favorite with the Indians of Oregon, Washington and British Columbia, who generally eat it in the fresh state, while the Indians of Alberta and Saskatchewan (to whom it is known as "saskatoon") not only eat it fresh and sun-dry it for winter use, but gather and sell it in large quantities to the white settlers, who relish it for pies and jams. March to May. White. ^{1/}

CERASUS B. Juss. Cherry.

CERASUS MOLLIS Dougl. Woolly bitter cherry. Common in open woods, City Park, L. & C. fair grounds, Mt. Tabor, South Portland, etc. The largest specimen of this tree found within the city limits measured $16\frac{1}{2}$ inches in diameter at base by 60 feet high. April, May. White.

CERASUS DEMISSA Nutt. Western choke cherry. Rare in open woods, Canyon road. April, May. White.

OSMARONIA Greene. Indian cherry.

OSMARONIA CERASIFORMIS (T. & G.) Greene. Indian cherry, oso berry. Very common in open woods, Macleay Park, Cornell road, St. Helens road, Sandy Boulevard, South Portland, etc. The flowers and young leaves, especially when bruised, emit a rank, balsamic and somewhat currant-like odor that is rather unpleasant. Although the amount of pulp on the Indian cherry is rather limited, it was yet a great favorite with the northwest Indians, who not only added it to several of the native dishes such as the camas cakes, stewed berries of various kinds, etc., on account of the cherry-like flavor it imparted to them, but they also made it up into pure cakes by itself. The fruit was gathered as soon as ripe, July or usually August (as it rapidly becomes dry after maturing). It was then pressed upward through a native wooden colander to detach the pulp, the pits were thrown away and the pulp was collected and made into a sort of paste or batter, which was then cut into small cakes about a fourth of an inch thick. These cakes were usually made about two and a half inches square, or occasionally round, and

perforated in the center to render them suitable for stringing and convenience in carrying, either on horseback or otherwise. They were then fire dried and put away for winter use.

The pulp of fruit grown in shady places tasted slightly bitter and astringent, but when grown in open, sunny situations it was vastly improved in flavor, and was relished and eaten by the whites in pioneer days. February to April. White.

FABACEAE Reichenb. Pea Family.

LUPINUS [Tourn.] L. Lupine.

LUPINUS HOLOSERICUS Nutt. 4. Shrubby lupine. On islands in Willamette river near mouth of Clackamas river. April to June. Bright blue.

LUPINUS POLYPHYLLUS Lindl. 4. Blue pod. In glades, Mt. Tabor, Mt. Scott, Milwaukie, Oswego, Oregon City, etc. In pioneer days this plant became a troublesome native weed in grain, especially in wheat fields, owing to the seeds being difficult to remove in screening, thus causing farmers annoyance by coloring the flour dark. April to June. Blue, purple, pink or white.

LUPINUS COLUMBIANUS Heller. 4. Meadow lupine. (*L. latifolius*.) Infrequent in meadows, glades and open woods about Portland, St. Johns and Vancouver. April to June. White to purple.

LUPINUS ALBICAULIS Dougl. 4. White stemmed lupine. On sand banks and bars near St. Johns. April to June. Blue, violet or whitish.

LUPINUS LEPIDUS Dougl. 4. Prairie lupine. Along railroad tracks, Albina and East Portland, where it is probably introduced, and in open places about Vancouver, where it is undoubtedly native. April to June. Violet or blue.

LUPINUS LAXIFLORUS Dougl. 4. Slender silky lupine. In fields and waste places about Oswego. April to June. Blue to white or yellowish.

LUPINUS MICRANTHUS Dougl. 1. Small flowered lupine. Infrequent in open places along the Willamette river. April to June. Blue.

ULEX L. Furze.

ULEX EUROPAEUS L. Furze, gorse. Open woods, Willamette Heights, Mountain View, Riverside, etc. Notwithstanding the numerous spines, this species is relished by horses and cattle. Introduced from Europe. February to November Yellow.

CYTISUS [Tourn.] L. Broom.

CYTISUS SCOPARIUS (L.) Link. Broom. Common on sandy soil, rocky slopes and waste places, Mt. Tabor, East Portland and along the Willamette river. Shunned by stock of all kinds owing to its bitter taste. This shrub, at first hailed with delight for its bright yellow flowers, has of late years increased so rapidly as to become a troublesome weed in some places. Naturalized from Europe. April to July. Yellow.

x ONONIS ARVENSIS L. Spiny rest-harrow. A recent immigrant here, but already established to some extent on roadsides and waste places, Willamette Heights, Blytheswood, etc. Adventive from the Mediterranean region. May to July.

MEDICAGO [Tourn.] L. Medic.

MEDICAGO SATIVA L. 4. Alfalfa. Common on roadsides, vacant lots and waste places about the city. Introduced from Europe. May to July. Violet.

MEDICAGO LUPULINA L. 1. Yellow trefoil. Not uncommon in fields and waste places, L. & C. fair grounds, Mt. Tabor, etc. Adventive from Europe. April to July. Yellow.

MEDICAGO HISPIDA Gaertn. 1. Bur clover. (*M. denticulata* Willd.) Infrequent in fields and waste places, Lower Albina, etc. Adventive from Europe. May to July. Yellow.

MELILOTUS [Tourn.] L. Melilot.

MELILOTUS INDICA (L.) All. 1. Yellow melilot. Infrequent in vacant lots and waste places, Lower Albina, etc. Adventive from Eurasia. May to July. Yellow, small.

x MELILOTUS OFFICINALIS (L.) Lam. 1. Yellow sweet clover. Infrequent, but gradually spreading on moist ground and waste places, Lower Albina, South Portland, etc. Naturalized from Europe. May to August. Yellow.

MELILOTUS ALBA Desv. 2. White melilot. Not uncom-

mon in moist ground and waste places and gradually spreading, not only in Portland but in other parts of the state. The leaves of this as well as other species of the genus are fragrant on drying, and the tips of the stems are collected and used to scent bureaus, etc. This fragrance is due to the presence of Coumarin ($C_9H_6O_2$), a proximate vegetable principle usually obtained from the Tonquin bean, but present in vanilla leaf and other plants. Any long continued inhaling of the odor is said to be injurious, and the seeds and leaves are considered poisonous to sheep. Naturalized from Europe. April to September. White.

TRIFOLIUM [Tourn.] L. Clover.

TRIFOLIUM PRATENSE L. 4. Red clover. Common in fields, roadsides and waste places about the city. This clover, the best of all the species for forage purposes, was first introduced into Oregon at Oswego lake, seven miles south of Portland, in April, 1854, by Charles W. Bryant, a native of New York and pioneer of 1853. Naturalized from Europe. April to October. Purplish-red.

TRIFOLIUM ERIOCEPHALUM Nutt. 4. Woollyhead clover. Open grassy places at head of Barnes road. May to July. Yellowish or white.

TRIFOLIUM REPENS L. 4. White clover. Common in fields, roadsides and waste places about the city. Introduced from Europe. April to November. White or pinkish.

TRIFOLIUM HYBRIDUM L. 4. Alsike clover. Not uncommon in fields and waste places, L. & C. fair grounds, Mt. Tabor, etc. Introduced from Europe. April to October. Pink to nearly white.

x TRIFOLIUM ARVENSE L. 1. Rabbit foot clover. Infrequent on roadsides and waste places, Willamette Heights, Blytheswood, etc. Naturalized from Europe, but native of Arabia. May to September. Pink, purplish or whitish.

x TRIFOLIUM MARITIMUM Huds. 1. Salt marsh clover. Infrequent on ballast grounds and waste places, Lower Albina, etc. Native of marshes in Great Britain and Ireland. Adventive from Europe. May to September. Pale purple.

TRIFOLIUM CILIOLATUM Benth. 1. Fringed clover. In moist grassy places, Willamette falls. May to July. Purple and white.

x TRIFOLIUM AUREUM Poll. 1. Hop clover. Not uncommon in fields and waste places around the city. Naturalized from Europe. April to September. Yellow, becoming brown in age.

TRIFOLIUM PROCUMBENS L. 1. Low hop clover. Common in fields, lawns and roadsides, L. & C. fair grounds, East Portland, Mt. Tabor, etc. Naturalized from Europe. May to September. Yellow.

TRIFOLIUM FIMBRIATUM Lindl. 1. Beach clover. In grassy glades about Oswego. May to August. Purple or reddish.

TRIFOLIUM TRIDENTATUM Lindl. 1. Three-toothed clover. Infrequent in open places, Fulton, Oswego, etc. A variable species. May to August. Purple and white.

TRIFOLIUM VARIEGATUM Nutt. 1. White tip clover. Infrequent in wet rocky places, Oswego, Risley station, etc. May to August. Purple with white tips.

TRIFOLIUM MICROCEPHALUM Pursh. 1. Smallhead clover. Fields, roadsides and wet places, Milwaukie, Risley station, etc. April to June. Pale pink.

TRIFOLIUM MICRODON H. & A. 1. Cup clover. Hillsides, railroad tracks and waste places, Lower Albina, etc. Native of western Oregon but may be introduced here. April to June. Rose color to light pink.

HOSACKIA Dougl. Bird foot trefoil.

HOSACKIA AMERICANA (Nutt.) Piper. 1. Bird foot trefoil. (*Lotus americanus*.) Rocky places, sand bars and sandy soil along Willamette river. In pioneer days and even later this plant was frequently used to make hay. June to October. Salmon color to pink or whitish.

HOSACKIA PARVIFLORA Benth. 1. Small flowered Hosackia. (*Lotus micranthus*.) Infrequent in open places, Oswego, Milwaukie, etc. May, June. Pale salmon turning reddish, minute.

HOSACKIA DECUMBENS Benth. 4. Yellow shoe strings.

(*Lotus Douglasii*) Glades, head of Barnes road. May, June. Yellow.

HOSACKIA BICOLOR Dougl. 4. Water Hosackia. (*Lotus pinnatus*.) In wet places and ditches, Gladstone, etc. May to July. Upper petals yellow, wings white.

PSORALEA L. Psoralea.

PSORALEA PHYSODES Dougl. 4. Western Psoralea. Brush land and margin of woods, Mt. Scott, Milwaukie, Oak Grove, etc. May to July. White to purplish.

ONOBRYCHIS [Tourn.] L. Hen's bill.

x ONOBRYCHIS VICIAEFOLIA Scop. 4. Hen's bill. Fields and waste places near Vancouver. Adventive from Europe. May to July.

VICIA [Tourn.] L. Vetch.

VICIA GIGANTHA Hook. 4. Giant vetch. In open woods, Macleay Park, Mt. Tabor, Mt. Scott, etc. April to June. Pale purple to pale saffron.

VICIA AMERICANA Muhl. 4. American vetch. Common in open woods everywhere around Portland. March to June. Purple changing to bluish.

VICIA TRUNCATA Nutt. 4. Blunt leaved vetch. Not uncommon in open woods about the city. April to June. Purplish.

VICIA HIRSUTA Koch. 1. Hairy vetch. Fields, roadsides and waste places around Portland. Naturalized from Europe. May to August. White to yellowish,

VICIA SATIVA L. 1. Tares. Common in fields and waste places around Portland. Introduced from Eurasia. April to July. Banner purple, wings red.

LATHYRUS [Tourn.] L. Wild pea, vetchling.

LATHYRUS POLYPHYLLUS Nutt. 4. Forest pea. In coniferous woods, Macleay Park, Willamette Heights, Mt. Tabor, Mt. Scott, etc. April to June. Purple.

LATHYRUS NUTTALLII Wats. 4. Nuttall's pea. Open woods, Mt. Scott, Milwaukie, Risley station, etc. April to June. Reddish-purple.

LATHYRUS TORREYI Gray. 4. Torrey's pea. Infrequent in open woods near Clackamas. April to June. Banner lilac, keel and wings white.

GERANIACEAE J. St. Hil. Geranium Family.

GERANIUM [Tourn.] L. Geranium, cranesbill.

GERANIUM CAROLINIANUM L. 1. Carolina cranesbill. Common in fields, lawns, roadsides and waste places around Portland. April to September. Pale pink.

x GERANIUM BICKNELLII Britton. 1. Bicknell's cranesbill. In fields, vacant lots and waste places around Portland. April to September. Rose color.

GERANIUM DISSECTUM L. 1. Cut-leaved cranesbill. Common weed in fields, waysides and waste places around Portland and throughout the Willamette valley generally. Naturalized from Europe. May to September. Rose-purple.

GERANIUM MOLLE L. 1. Spreading cranesbill. Fields, lawns and roadsides about the city; not common. Adventive from Europe. April to September. Rose-purple, small.

GERANIUM PUSILLUM L. 1. Small cranesbill. A weed in lawns, waysides and grassy places everywhere around Portland. Naturalized from Europe. April to September. Pale purple.

x GERANIUM PYRENAICUM Burm. f. 4. Meadow geranium. Recently introduced weed on ballast grounds and waste places, Lower Albina, East Portland and Riverdale. Adventive from Europe. May to September. Rose color.

GERANIUM OREGANUM Howell. 4. Oregon Geranium. On Rock island in Willamette river opposite Elk Rock. May to September. Bright purple.

ERODIUM L'Her. Storksbill.

ERODIUM CICUTARIUM (L) L'Her. 1. Alfilaria. Common weed in fields, roadsides and waste places, Lower Albina, St. Johns, Mt. Tabor, Sandy Boulevard, etc. Very common east of the Cascade mountains. Blooms in early spring (March 1st) and throughout the summer. Naturalized from Europe. Pink to rose-purple.

OXALIDACEAE Lindl. Wood sorrel Family.

OXALIS L. Wood sorrel.

OXALIS OREGANA Nutt. 4. Oregon wood sorrel. In moist shady woods, Cornell road, St. Helen's road, etc. April to June. White with purple veins.

OXALIS TRILLIIFOLIA Hook. 4. Tall wood sorrel. Infrequent on moist creek banks, Balch creek, Holbrook creek, Logie trail, etc. April to June. White.

OXALIS SUKSDORFII Trelease. 4. Western yellow wood sorrel. Rather handsome native "weed," not uncommon in open woods, waysides, cut banks and borders of fields, Albina, East Portland, Mt. Tabor, Mt. Scott, Division street, etc. April to November. Yellow.

x OXALIS STRICTA L. 4. Fragrant wood sorrel. Ballast grounds and waste places, Lower Albina, etc. Adventive from the eastern states. Yellow with reddish base; fragrant.

LINACEAE Dumort. Flax Family.

LINUM [Tourn.] L. Flax.

LINUM USITATISSIMUM L. 1. Common flax. Infrequent in fields, roadsides and waste places, L. & C. fair grounds, Mt. Tabor, Sandy Boulevard, etc. Introduced from Europe. Flax was first introduced into Oregon from Indiana by James Johnson, a pioneer who crossed the plains in 1844 and planted it near Lafayette, Yamhill county, in 1854. May to September. Blue, fugacious.

RUTACEAE Juss. Rue Family.

RUTA [Tourn.] L. Rue.

x RUTA GRAVEOLENS L. 4. Common rue. Occurs sparingly in open grassy places and vacant lots, Goldsmith's Addition, Lower Albina, etc. Probably a garden escape. Introduced from Europe. June to August. Yellow.

EUPHORBIACEAE J. St. Hil. Spurge Family.

EUPHORBIA L. Spurge.

EUPHORBIA SERPYLLIFOLIA Pers. 1. Thyme-leaved spurge. Grassy glades along Willamette river, Bridgeton, Columbia Beach, Hayden island, etc. May to September. Apetalous, minute.

EUPHORBIA GLYPTOSPERMA Engelm. 1. Ridge-seeded spurge
In sandy soil and on sand banks, Willamette river, University
Park. etc. June to September. Apetalous.

x EUPHORBIA PEPLIOIDES Gouan. 1. On ballast grounds
and waste places, Lower Albina, etc. Adventive from Europe.
June to September. Apetalous.

x EUPHORBIA HELIOSCOPIA L. 1. Wartweed. Ballast
grounds and waste places, Lower Albina, East Portland, etc.
Adventive from Europe. May to September. Apetalous.

EUPHORBIA CRENULATA Engelm. 2-4. Toothed spurge.
On Rock island, Willamette river opposite Elk Rock and at Wil-
lamette falls. Rare here. May to September. Apetalous.

PISCARIA Piper.

PISCARIA SETIGERA (Hook.) Piper. 1. Turkey mullein.
(*Eremocarpus setigerus*.) On ballast grounds and along rail-
road tracks, Lower Albina and East Portland. Native of eastern
Oregon and California; adventive here. May to July. Flowers
small, apetalous.

CALLITRICHACEAE Lindl. Water starwort Family.

CALLITRICHE L. Water starwort.

CALLITRICHE VERNA L. 4. Vernal water starwort. Ponds
and ditches, East Portland. June to August. Minute, apetalous.

LIMNANTHACEAE Lindl. False mermaid Family.

FLOERKEA Willd. False mermaid.

FLOERKEA PROSERPINACOIDES Willd. 1. False mermaid.
Under ash trees, head of Sauvie's island. April to June. White.

ANACARDIACEAE Lindl. Sumac Family.

RHUS L. Sumac.

RHUS DIVERSILOBA T. & G. Poison oak. Very common
in open woods and on sunny slopes, Macleay Park, Fulton, South
Portland, Mt. Tabor, Rocky Butte, Brooklyn, Slavin road, Cor-
nell road, St. Helens road, 21st and Pettygrove streets, 22d and
Thurman streets, etc. Vile, noxious shrub, without a single re-
deeming quality or beauty, either of flower, fruit or leaf. The
clearing away of the forest in this section during the past forty

years has caused it to multiply rapidly and results in scores of persons becoming poisoned by it every season. It is to be hoped that the municipal authorities will undertake its extermination within the city limits in the near future. One of the most effective remedies for its poisoning is sweet spirits of nitre as a preventative and Labaracque's solution as an antidote, both to be used externally. Many of the individual shrubs bloom twice in a season, the spring flowers appearing in April, the autumn flowers in October. Yellowish-green, minute.

CELASTRACEAE Lindl. Staff tree Family.

EUONYMUS [Tourn.] L. Strawberry bush.

EUONYMUS OCCIDENTALIS Nutt. Western strawberry bush. Moist creek banks, Balch creek, St. Helens road and on creeks seven miles east of Vancouver. May, June. Brownish-purple.

ACERACEAE St. Hil. Maple Family.

ACER [Tourn.] L. Maple.

ACER MACROPHYLLUM Pursh. Oregon maple. Common everywhere around Portland. Although a dicotyledon, three cotyledons are not uncommon in this species, but tricarpeillary fruit is comparatively rare. The flowers, which appear in April, are greatly relished by the mountain grosbeaks as well as by the myriads of bees, wasps and smaller insects which visit a tree of this species when in full bloom. April, May. Greenish-yellow.

ACER GLABRUM Torr. Dwarf maple. Rare in our limits. On banks of Clackamas river near the county bridge. April, May. Greenish-yellow.

ACER CIRCINATUM Pursh. Vine maple. Common in moist woods, Macleay Park, City Park, L. & C. fair grounds, Mt. Tabor, etc. Usually a small, much branched, sprawling tree, 3 to 7 inches in diameter by 15 to 25 feet high within our limits, but a specimen collected on Necanicum river, Oregon, measured 13½ inches in diameter at base by 30 feet high. Tricotyledonous seedlings are infrequent, but in certain seasons tricarpeillary fruits are not uncommon, about 100 being formed on a single tree in Portland. April, May. Calyx dark red, petals greenish white.

RHAMNACEAE Dumort. Buckthorn Family.

RHAMNUS [Tourn.] L. Buckthorn.

RHAMNUS PURSHIANA DC. Cascara Sagrada. In open coniferous woods, head of Jefferson street, Macleay Park, L. & C. fair grounds, etc. April, May. Greenish.

CEANOTHUS L. Mountain lilac.

CEANOTHUS SANGUINEUS Pursh. Woodland spray. Common in open woods and hillsides, South Portland, Fulton, Portland Heights, Cornell road, Mt. Tabor, Mt. Scott, etc. This slender, graceful shrub has greatly increased in our limits as the surrounding forest has been cleared away. The foliage is relished by sheep. April, May. White.

CEANOTHUS VELUTINUS Dougl. Mountain balm. Occurs sparingly about Rocky Butte and Montavilla. Commonly known as "sticky laurel" by sheepmen and ranchers. The leaves are glossy as if varnished and exude a viscid substance with a heavy, spicy, balsamic odor that is unpleasant to most people. The autumn flowers appear in September and early October. May to October. White.

CEANOTHUS LAEVIGATUS (T. & G.) Howell. Smooth mountain balm. In open woods along Tualatin river. May, June. White.

CEANOTHUS MACROTHYRSUS (Torr.) Greene. Large false lilac. (*C. californicus*.) On rocky banks above Oregon City. May, June. Pale blue to white.

CEANOTHUS CUNEATUS (Hook.) Nutt. Buck brush, blue brush. On rocky stream banks, Willamette river near Oswego. April to June. White, rarely light blue.

MALVACEAE Necker. Mallow Family.

MALVA [Tourn.] L. Mallow.

MALVA ROTUNDIFOLIA L. 1-2. Running mallow. Road-sides, vacant lots and waste places, L. & C. fair grounds, Lower Albina, Mt. Tabor, etc. Naturalized from Europe. Britton's Manual says flowers "pale blue;" Gray says "whitish;" Howell says "pale purple;" Jepson says "pale blue;" Nelson says "pale blue or whitish;" Piper and Beattie say "pale blue." In ours

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