Specimens examined:

Idaho: Salmon, June 23, 1920, *Payson & Payson 1768* (R.Mt., Mo., Gray); Arco, June 19, 1893, *Palmer 189* (U.S.); Challis, July 15, 1916, *Macbride & Payson 3223* (R.Mt., Gray); Martin, July 5, 1916, *Macbride & Payson 3039* (R.Mt., Mo., U.S., Gray); Minidoka, June 23, 1912, *Nelson & Macbride 1799* (R. Mt., Mo., U.S., Gray); Shoshone, May 27, 1899, *Saunders 4875* (Mo.); Boise-Payette Project, June 2, 1911, *Macbride 875* (Pomona, R. Mt., Minn., Field, Mo., U.S., Gray); New Plymouth, May 21, 1910, *Macbride 93* (R.Mt.); Weiser, April 26, 1900, *Jones 6673* (Pomona).

Washington: Wilson Creek, eastern Washington, June, 1893, *Sandberg & Leiberg* (Pomona, Minn.); Ritzville, June 6, 1893, *Sandberg & Leiberg 164* (Wash., Calif., Mo., U.S., TYPE, Gray).

C. spiculifera is a fairly well-defined unit characterized by narrow radical leaves with conspicuously setose petioles. The caudex is multicipital and the leaves are very numerous in typical forms. It is likely to be confused with *C. Macounii*, and at one time the author was inclined to unite the two as varieties under one specific name. This process of submergence would lead to such wholesale reductions, however—*Sheldonii, Macounii, spiculifera, interrupta, rugulosa, Bradburiana, sobolifera*—that it seemed unwise. *C. spiculifera* has some contact, too, with *C. nana* var. *Shantzii*. A specimen from southeastern Idaho was examined that looked remarkably like *spiculifera* but the nutlets were uniformly muricate as in the var. *Shantzii*. This intermediate plant might, of course, have been a hybrid.

27. C. celosioides (Eastw.) new comb. Plate 28, figs. 74–76.

Oreocarya celosioides Eastw. Bull. Torr. Bot. Club **30:** 240. 1903.

Long-lived perennial from a stout, woody root; stems 1–several from a leafy caudex which is densely clothed with the broad imbricated petioles of former leaves, stout, 2–4 dm. high, densely setose with stiff divaricate bristles; leaves clustered at the base of the stem—or only the petioles of former leaves remaining to show the basal tuft—spatulate to oblanceolate, usually obtuse, 2–5 cm. long, densely setose with spreading white bristles and

subtomentose, densely pustulate on both surfaces, petioles conspicuously ciliate; inflorescence extending over upper ½ to ⅔ of stem, becoming rather broad due to the elongation of the cymules, densely setose, foliar bracts inconspicuous; calyx densely setose with spreading bristles, sepals in anthesis about 5 mm. long, linear-lanceolate, acute in fruit, about 12 mm. long, exceeding the nutlets by about 8 mm.; corolla white, tube 4–5 mm. long, about as long as the sepals, crests at the base of the tube well-developed, conspicuous, fornices nearly 1 mm. high, probably yellow, slightly papillose, limb about 8 mm. across, lobes and tube subequal, lobes united for ¼ to ⅓ their length; fruit ovoid, 2–4 nutlets maturing, style exceeding the mature nutlets by 2.5–3 mm.; nutlets 4–5 mm. long, ovate-lanceolate, acute, margins acute, almost winged, in contact, surfaces of nutlets dull or slightly glossy, the dorsal conspicuously rugose toward the middle and muriculate toward the edge, somewhat tuberculate also, in the type collection slightly keeled, the ventral surfaces rugose or tuberculate and somewhat muriculate, scar straight, closed, extending from near the base to near the apex, margin not elevated.

Distribution: Upper Sonoran Zone along the Columbia River in Washington and in the drainage of the John Day River in Oregon. Type: "*Thos. J. Howell*, from the banks of the Columbia River, eastern Washington, July, 1881."

Specimens examined:

Washington: Washington Terr. 1883, *Brandegee 996* (Calif., Gray); Klickitat Hills, May, 1888, *Howell 431* (Wash., Calif.); banks of Columbia River, July, 1881, *Howell* (Calif.); Rock Island, Kittitas Co., July 12, 1893, *Sandberg & Leiberg 440* (Wash., Calif., Minn., U.S., Gray); near Columbus, June 10, 1886, *Suksdorf 888* (Calif., Field, Mo., U.S., Gray); Wenatchee, 1895, *Whited* (Wash.); Wenatchee, May 28, 1899, *Whited 1099* (Wash., U.S., Gray).

Oregon: Dalles, May, 1882, *Howell* (Phila.); Mitchell, Aug. 1, 1917, *Lawrence 1030* (U.S.); near Fossil, Gilliam Co., May 29, 1894, *Leiberg 125* (U.S.); Canyon City, July, 1902, *Griffiths & Hunter 170* (U.S.); dry hills near Fossil, Wheeler Co., June 2, 1925, *Henderson 5212* (Mo., Gray); Kimberly, Grant Co., June

24, 1925, *Henderson 5212* (Mo., Gray); dry slope, Clarno, southeast Wasco Co., July 3, 1921, *Peck 10020* (N.Y.).

I would limit this plant to the Upper Sonoran Zone of central Washington and Oregon. This is in essential agreement with Piper in his 'Flora of Washington' except that he includes one plant (*Cotton 359* from the Rattlesnake Hills) which I refer, rather dubiously, to *C. Macounii*. He says that *celosioides* comes from the "Arid Transition" Zone but according to the map of life zones in his 'Flora,' the localities in which *celosioides* are found are all in the Upper Sonoran Zone. The large nutlets and stout stems are the best characters of *celosioides* that may be used to separate it from its nearest allies—*C. Sheldonii* and *C. spiculifera*.

28. C. Sheldonii (Brand) new comb. Plate 28, figs. 77–79.

Oreocarya sericea Piper, Contr. U.S. Nat. Herb. **11:** 482. 1906, not *Krynitzkia sericea* Gray.

O. celosioides Macbr. Contr. Gray Herb. **48:** 29. 1916, in part, as to specimens cited, not *O. celosioides* Eastw.

O. glomerata Standley, Contr. U. S. Nat. Herb. **22:** 401. 1921, not *Cynoglossum glomeratum* Pursh.

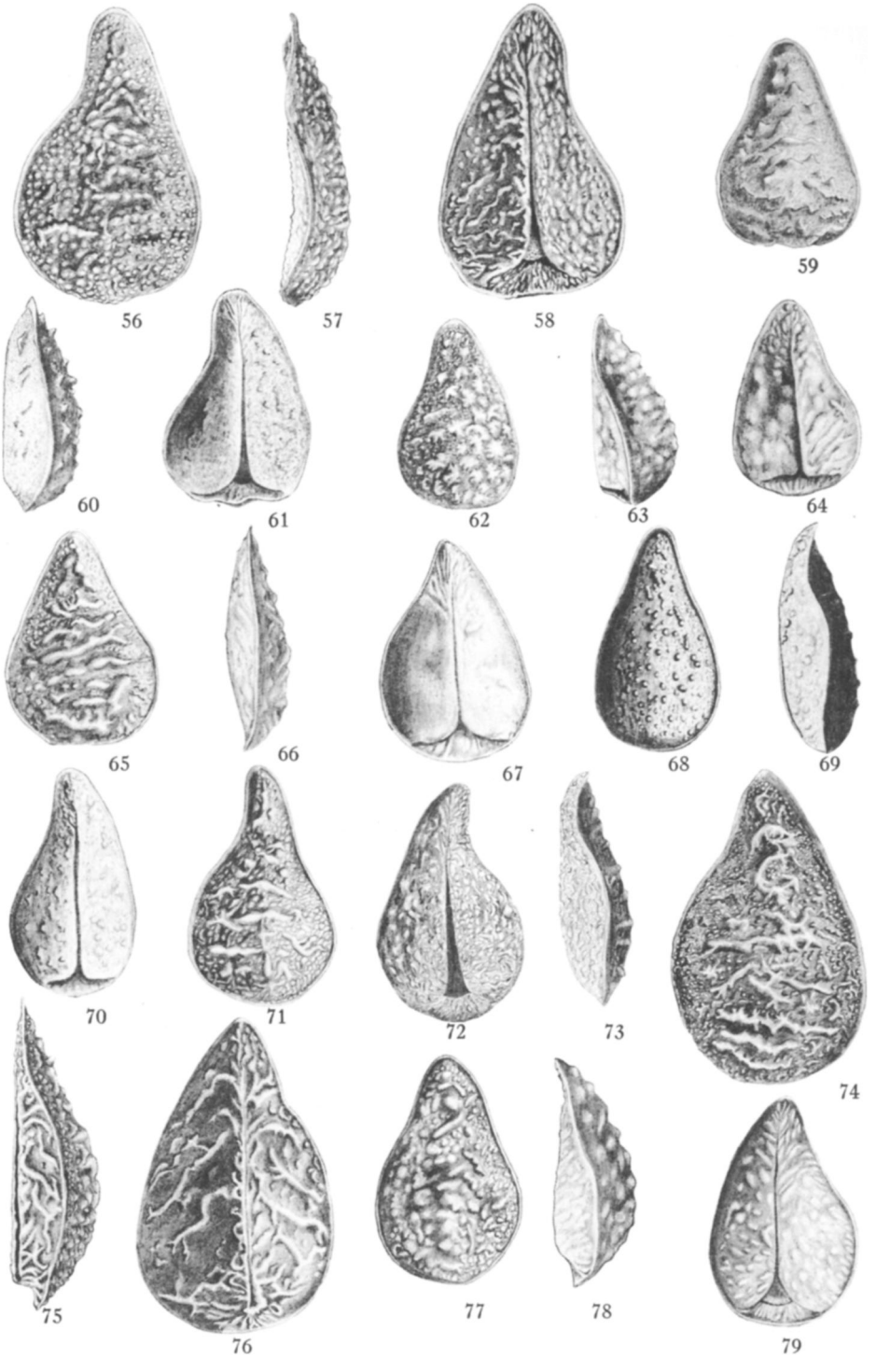
O. Sheldonii Brand, Fedde, Rep. Sp. Nov. **19:** 73. 1923.

Definitely perennial, rather loosely caespitose; stem rather stout, 2–3 cm. high, abundantly setose with rather slender, divaricate hairs; basal leaves numerous, spatulate to oblanceolate, usually obtuse, 2–4 cm. long, 5–8 mm. broad, abundantly setose with rather weak subappressed hairs, the older leaves distinctly tomentose, pustules present on both leaf surfaces; cauline leaves similar, reduced upwards; inflorescence setose, rather narrow or the branches elongating in age, mainly uninterrupted, extending over ½ to ¾ of the stem, foliar bracts inconspicuous; calyx densely setose, sepals in anthesis linear-lanceolate, acute, 3–5 mm. long, in fruit about 8 mm. long, exceeding the nutlets by 4–5 mm.; corolla white, tube 4 mm. long, subequal to the sepals in anthesis, crests at the base of the tube evident, fornices 0.5 mm. high, probably yellow, papillose, limb 5–10 mm. broad, limb and tube subequal or the tube slightly longer than the limb, lobes united for about ⅓ their length; fruit ovoid or lanceolate-ovoid, all four nutlets commonly maturing, style exceeding the

Explanation of Plate

PLATE 28

Figs. 56–58. *C. elata.* Drawn from *Osterhout 5996.*
Figs. 59–61. *C. sericea* var. *typica.* Drawn from *Payson & Payson 2528.*
Figs. 62–64. *C. aperta.* Drawn from type, *Eastwood,* Grand Junction, Colorado.
Figs. 65–67. *C. rugulosa.* Drawn from type, *M. E. Jones,* Fish Springs, Utah.
Figs. 68–70. *C. interrupta.* Drawn from *Heller 9185.*
Figs. 71–73. *C. spiculifera.* Drawn from type, *Sandberg & Leiberg 164.*
Figs. 74–76. *C. celosioides.* Drawn from *Suksdorf 888.*
Figs. 77–79. *C. Sheldonii.* Drawn from type, *Sheldon 8315.*



PAYSON—SECTION OREOCARYA OF CRYPTANTHA

COCKAYNE, BOSTON