6. **M. laxa** Lehm. Annual or soboliferous perennial; roots fasciculate and fibrous; stems slender, erect or decumbent, solitary, loosely branched commonly from the base, terete, sparsely strigose; leaves sparsely strigose, the lower ones oblanceolate or spathulate, 3–6(–8) cm. long, 6–10(–12) mm. wide, the upper ones gradually reduced, narrowly linear-lanceolate or linear-oblong; racemes geminate or solitary, with the principal one leafy-bracted just above the base; calyx sparsely strigose, lacking uncinate hairs, usually with narrowly ovate-triangular or almost cuneate lobes about equalling the tube in length; pedicels slender, longer than the mature calyx; corolla light-blue with yellow appendages, limb slightly concave, 3–6 mm. broad; style usually shorter than the nutlets and reaching much below the level of the calyx-sinuses.—Asperif. i. 83 (1818); Johnston, Contr. Gray Herb. lxx. 41 (1924) where further synonymy.

ARGENTINA. Buenos Aires: vicinity of Buenos Aires, 1913, *Rodriquez 167* (G).
CHILE. Valdivia: Valdivia, 1899, *Buchtien* (US).

A native of Europe and North America, but probably introduced in South America.

Doubtful or Excluded Species.

M. foliosa Lehm. Asperif. i. 99 (1818).—"America meridionalis"—Probably a species of *Lithospermum* and perhaps the same as the next.

M. grandiflora HBK. Nov. Gen. et Sp. iii. 90, t. 199 (1818).—Although given as from Ecuador this appears to be Lithospermum distichum Ort. and to have come, in fact, from Mexico, cf. Johnston, Contr. Gray Herb. lxxv. 40 (1925).

9. **Cryptantha** Lehm.

Calyx usually cut to the base, the lobes erect or connivent, linear or oblong. Corolla with usually a short cylindrical tube, with or without scales at the base inside; lobes imbricate, rounded, spreading; throat with intruded appendages. Style slender, short or long, included; stigma capitate. Ovules 2–4. Nutlets 1–4, erect, ovate to triangular, roughened or smooth, margined or marginless, affixed laterally through a medial ventral and commonly basally forked groove to a usually columnar subulate or pyramidal gynobase.—Annual or perennial herbaceous or fruticulous plants, usually with coarse stiff pubescence. Leaves opposite at base, firm, veinless. Flowers white or very rarely yellow, in bractless or bracted spikes or racemes. Mature calyx in-

vesting the nutlets and falling away as a bur or persistent with the nutlets falling away individually.—Del. Sem. Hort. Hamburg iv. (1833); Don. Gen. Syst. iv. 373 (1837). *Krynitzkia* F. & M. Ind. Sem. Hort. Petrop. vii. 52 (1841). *Piptocalyx* Torr. in Wats. Bot. King Exped. 240 (1871). *Oreocarya* Greene, Pittonia i. 57 (1887). *Eremocarya* Greene, Pittonia i. 58 (1887). *Greeneocharis* Gürke & Harms in E. & P. Nat. Pflanzenf., Gesamtreg. 462 (1899). *Wheelerella* Grant, Bull. So. Calif. Acad. v. 28 (1906). *Johnstonella* Brand in Fedde, Repert. xxi. 249 (1925).

One of the largest and most perplexing genera of the *Boraginaceae*. It is exclusively American. About two-thirds of the approximately 150 species occur in western United States. In South America the genus is most abundant in Chile with outlying species in Peru, Bolivia and Argentina.

As here defined, the genus includes the North American group of coarse perennials current as *Oreocarya*. My study of the South American species of *Cryptantha* has convinced me that the recognition of *Oreocarya* has been most arbitrary. That group appears to consist merely of the more or less coarse persistent members of *Cryptantha* § *Krynitzkia*. I am convinced that the characters of the sections of *Cryptantha* defined below are much more fundamental than are such "generic" characters as coarseness of habit and persistence of root which must be stressed in justifying the continued maintenance of *Oreocarya*. I do not believe that *Oreocarya* should be recognized unless the primitive, coarse, persistent species and the more evolved, slender, annual ones in the three sections of *Cryptantha* each be given generic recognition. Personally I do not approve of, and certainly will not be responsible for the segregation of 5 weak genera from the currently accepted *Cryptantha* simply to give logical justification for the maintenance of any mere habit-genus as indefinite as *Oreocarya*.

Key to Sections.

Plants not producing cleistogamic flowers; North and South America.....I. § *Krynitzkia* (spp. 1–22).

Plants producing cleistogamic flowers; South America.

Cleistogamic flowers simple, borne in the middle and upper or frequently in all the leaf-axils, occasionally replacing the chasmogamic flowers in the inflorescence proper.
II. § *Eucryptantha* (spp. 23–30).

Cleistogamic flowers highly specialized, appearing as persistent ovoid or lenticular structures (cleistogenes) borne at the base of the plant below or just above the surface of the ground.....III. § *Geocarya* (spp. 31–40).

I. Section Krynitzkia.—This is the largest and most difficult section of *Cryptantha* and is distinguished from the other two sections

of the genus by the complete lack of cleistogamic flowers. It reaches its maximum development in North America, where it is represented by about 100 species. There can be little doubt that in the section are found the most primitive members of the genus. One species, *C. albida*, occurs in both North and South America. The only other approach to this condition is the case of *C. parviflora*. This species, while evidently separable, is very closely related to the North American *C. Grayi* and *C. angustifolia*. The species assembled in the series *Barbigerae* are as a group clearly related to those North American species I have collected under that heading, cf. Contr. Gray Herb. lxxiv. 60–69 (1925). It is interesting to note that whereas the short style overwhelmingly predominates among the North American species of the section, the long style is somewhat more common among the southern members. In North America there are numerous species with smooth polished nutlets; in South America there are only four, all closely related and quite different from the northern forms. *Cryptantha gnaphalioides* is a peculiar shrubby perennial, which would be refered to the genus *Oreocarya* if it grew in North America. In other than its habit, however, it is much like *C. dichita*, *C. hispida* and *C. phaceloides*, species which in some regards are reminiscent of the Californian *C. mohavensis*.

Key to Species.

Nutlets perfectly smooth and shiny, large, 2.8–3.3 mm. long. Chile.
- Plant perennial, shrubby at base. *Gnaphalioides*....1. *C. gnaphalioides.*
- Plant an annual herb. *Phaceloides.*
  - Corolla 7–10 mm. broad; leaves 7–13 mm. broad.....2. *C. dichita.*
  - Corolla 4–7 mm. broad; leaves 2–3 mm. broad.
    - Nutlets 2.....3. *C. hispida.*
    - Nutlets 4.....4. *C. phaceloides.*

Nutlets more or less roughened and dull.
- Nutlets thick with deep plane sides, not crowded, only impinging on one another close to the gynobase and hence separated by open re-entrant sinuses, anterior face occupied by a large triangular (apparently) excavated areola; gynobase narrowly pyramidal; northern Argentina. *Albidae*.....5. *C. albida.*
- Nutlets strongly compressed with angulate or rounded edges, crowded and closely juxtaposed, not separated by open broad sinuses, anterior face with a very small shallow areola; gynobase subulate.
  - Edges of nutlets sharp, with a definite thin margin; abaxial nutlet more or less emphasized, usually largest and most persistent. *Angustifoliae.*
    - Nutlet homomorphous, 1–1.5 mm. long; spikes bracted throughout; Argentina.....6. *C. diplotricha.*
    - Nutlets heteromorphous, 0.6–1 mm. long; spikes bractless or bracted at base only; Chile and Peru..7. *C. parviflora.*

Edges of nutlets merely angled or rounded, not sharp, mostly marginless but more or less thickly margined in a few species; axial nutlet more or less emphasized, usually the largest or most persistent. *Barbigerae.*
Corolla evident or conspicuous, 2–7 mm. broad.
Spikes bractless; Chilean.
Plant persistent, a perennial or long-lived annual; stems becoming prostrate or trailing.
Plant loosely branched, forming a loose broad open mat, pubescence canescent; corolla 5–6 mm. broad.....8. *C. subamplexicaulis.*
Plant densely branched, forming a dense cushion, pubescence silvery; corolla 2–4 mm. broad.9. *C. argentea.*
Plant a short-lived annual; branches short, erect or ascending.
Nutlets homomorphous, obscurely roughened 10. *C. chaetocalyx.*
Nutlets heteromorphous, definitely tuberculate or papillate.....11. *C. filiformis.*
Spikes bracted.
Corolla 2–4 mm. broad; nutlets homomorphous or heteromorphous, 1.3–1.8 mm. long.
Style much surpassing the 4 nutlets; Peru....12. *C. granulosa.*
Style shortly surpassing the 2–4 nutlets; Chile. 13. *C. taltalensis.*
Corolla 5–6 mm. broad; nutlets homomorphous, ca. 2 mm. long; Chile.....14. *C. Romani.*
Corolla inconspicuous or minute, 0.5–1.5(–2) mm. broad.
Spikes bracted; style noticeably surpassing the nutlets.
Fruiting calyx 3–4 mm. long, with narrow erect or slightly spreading lobe-tips; Chile and southern Peru.....15. *C. filaginea.*
Fruiting calyx 5–6 mm. long, with broad decidedly spreading lobe-tips; Peru.....16. *C. limensis.*
Spikes bractless; style equalling the nutlet or just surpassing them.
Nutlets obscurely tuberculate or almost smooth.
Fruiting calyx 8–11 mm. long; nutlets lanceolate, 2.8–3.2 mm. long; plant coarse shaggy-hirsute; Andes of northern Chile.....17. *C. calycina.*
Fruiting calyx 2–3 mm. long; nutlets lance-ovate, ca. 2 mm. long; plant finely strigose or appressed short-hispid; Patagonia.....18. *C. patagonica.*
Nutlets definitely tuberculate or wrinkled.
Back of nutlets tuberculate, coarsely if at all transversely grooved.
Fruiting calyx 2.5–3 mm. long, lobes lance-linear or narrowly lanceolate; Peru.....19. *C. peruviana.*
Fruiting calyx 3–4 mm. long, lobes linear or lance-linear; Chile and Argentina....20. *C. globulifera.*
Back of nutlets with transverse lineate grooves.
Spikes very tawny; fruiting calyx 3–4 mm. long; plant stiff; Chile and Argentina....21. *C. diffusa.*
Spikes green; fruiting calyx 2–2.5 mm. long; plant weak; Bolivia.....22. *C. debilis.*

1. **Cryptantha gnaphalioides** (A. DC.) Reiche. Perennial, 2–4 dm. tall, becoming much branched and shrubby, commonly decidedly

woody towards the base; stems erect, closely white-strigose and frequently sparsely hirsute also, cottony-strigose towards base, older parts with exfoliating bark; leaves linear to lance-linear, broadly attached, 1–4(–6) cm. long, 1.5–2.5(–3) mm. broad, obtusish or acutish, more or less strigose and frequently somewhat hirsute, usually canescent, spreading, abruptly reduced above, with leaf-buds or fasciculate leaves in the axils, bases more or less persistent; racemes unbracted, geminate, 1–4 cm. long, not loose, pedunculate; fruiting calyx tardily deciduous, oblong-ovate, 4.5–6 mm. long; mature calyx-lobes oblong-linear, obtusish, densely strigose or abundantly short-hirsute; pedicels 1–2 mm. long; corolla white, 5–9 mm. broad; ovules 4; nutlets 1–4, apparently with the axillary one always developing, ovate-oblong, smooth and shiny, light colored, frequently somewhat mottled with brown, 2.8–3.3 mm. long, 1.2–1.5 mm. broad, apex acute and slightly outcurved, base rounded, edges acute particularly above the middle; back of nutlet flattish or low convex, occasionally above the middle somewhat obtuse with a rather definite medial ridge; inner face of nutlet right-angled with the groove closed throughout; gynobase about $\frac{2}{3}$ height of nutlets; style usually very conspicuously surpassing the nutlets, more than twice the length of the gynobase.—Anal. Univ. Chile cxxi. 822 (1908) and Fl. Chile v. 227 (1910). *Eritrichium gnaphalioides* A. DC. Prodr. x. 131 (1846); Clos in Gay, Fl. Chile iv. 466 (1849); Ph. Fl. Atac. 39 (1860) and Viage Des. Atac. 213 (1860); Ph. Cat. Pl. Itin. Tarapaca 56 (1891). *E. fruticosum* Ph. Linnaea xxix. 15 (1857).

CHILE. Coquimbo: Baños del Toro, *no collector given* (MS); Pachuana, Oct. 1878, *Philippi* (MS); rocky place, Prov. Coquimbo, Sept. 1836, *Gay 1077* (MS, type of *E. fruticosum;* G, photo.); Prov. Coquimbo, 1839, *Gay* (G, photo. of type of *E. gnaphalioides*). Atacama: Rio Laguna Grande, 2300 m. alt., Jan. 1924, *Werdermann 238* (G, US, FM, IP); Potrero de Toledo, Rio Laguna Grande, 2660 m. alt., Jan. 1926, *Johnston 5895* (G); Yerba buena near Carrizal, Sept. 1885, *King* (MS); Yerba buena, Oct. 1871, *Reed* (G); Bandurrias, 1885, *Geisse* (MS); Desert of Atacama [Bandurrias] *Geisse 24* (NY); Copiapó, June 1841, *Gay 1074* (MS); Aguada del Tabaco, Sierra San Miguel, 3000 m. alt., Nov. 1925, *Johnston 4892* (G); Quebrada San Miguel above Los Marayes, Sierra San Miguel, Nov. 1925, *Johnston 4919* (G); Quebrada de Paipote, Jan. 1885, *F. Philippi* (MS); Potrerillos, 1920, *Harding 22848* (US, NY); vicinity of Potrerillos, 2500 m. alt., Oct. 1925, *Johnston 3696* (G); Quebrada de Doña Ines Chica, Jan. 1886, *Gigoux* (G). Indefinite: no locality given, *Gay* (G, NY).

A common and very characteristic undershrub of gravelly slopes and plains between 2000 and 3000 m. alt. in the arid mountains of the Province of Atacama. Frequently the dominant perennial over large areas. The greatest abundance of the plant noted was on the barren llano near the highest point on the railroad between Copiapó

and Pueblo Hundido, where at about 2000 m. alt. the plants of this species were extremely common and apparently the only kind of vegetation over many square kilometers. The plant is well known to the natives frequenting the mountains as "Té burro," "Té del campo" or "Té blanco." An infusion of the leaves is used as a beverage. Generally, however, this *Cryptantha* is used in tea-making only when the more generally favored "Té colorado" or *Vivania rosea* is unobtainable.

2. **C. dichita** (Ph.), comb. nov. Very coarse annual, 1–3 dm. tall; stems erect or ascending, one to several, subsimple or with a few short ascending branches, short-hispid and (especially above) coarsely pungent tawny-hirsute, 2–4 mm. thick; leaves broad and coarse, obtuse, hirsute and short-hispid, at least the under surface conspicuously pustulate, the lower leaves 7–11 mm. broad and 5–7 cm. long; middle and upper cauline leaves oblong or lanceolate, 3–5 cm. long, 8–13 mm. broad; spikes coarse, dense, 1–2 cm. long, bractless or with a leafy bract at base; fruiting calyx ovate-oblong, coarse, ca. 5 mm. long, short pedicellate; fruiting calyx-lobes linear or spathulate-linear, erect, hirsute and hispid, midrib not prominent; corolla large, 7–10 mm. broad, white with a yellow throat; fruit 4-ovulate; nutlets 2, oblong-lanceolate, 3–3.3 mm. long, smooth and shiny, apex acute, back flat or low convex, sides angled, groove very narrow; gynobase $\frac{1}{2}$–$\frac{2}{3}$ height of nutlets; style very much surpassing nutlets, about twice length of gynobase.—*Eritrichium dichita* Ph. in Villanueva, Anal. Univ. Chile liii. 444 (1878), nomen; Ph. Anal. Univ. Chile xc. 516 (1895); Reiche, Anal, Univ. Chile cxxi. 831 (1908) and Fl. Chile v. 236 (1910).

CHILE. ATACAMA: "Desierto de Atacama," 1877, *Villanueva* (MS, TYPE; G, photo.); Potrerillos, 1920, *Harding 22849* (US); near Los Alamos, Quebrada de Potrerillos, 2400 m. alt., *Johnston 3695* (G).

The two collections with precise locality-data both come from about Potrerillos in the Department of Chañaral. Since Villanueva, who collected the type, mentions visiting the Quebrada Salado and such other localities in the Potrerillos region as Pedernales Lake, Doña Ines Chica, etc., it is not improbable that the type of the species actually came from that general region. According to him the plant was called "dichita" and was eaten by animals.

3. **C. hispida** (Ph.) Reiche. Annual, 1–2 dm. tall, coarsely hirsute, stiffly erect with a few short strictly ascending floriferous branches above; leaves linear, strictly ascending, 1–4 cm. long, 2–3 mm. broad, coarsely hirsute; spikes dense, bractless, ca. 1 cm. long;

fruiting calyx ovate-oblong, 4–5 mm. long, short-pedicellate; mature calyx-lobes linear, erect, commonly hirsute, midrib not very prominent; corolla 5–7 mm. broad, white; fruit 4-ovulate; nutlets 1–2, smooth and shiny, pale, oblong-lanceolate, 3–3.3 mm. long, ca. 1.4 mm. broad, apex acute, base rounded, edges angled, back flat or broadly obtuse with a weak but definite medial ridge, ventrally right-angled, groove closed to base and unforked; gynobase $\frac{1}{2}-\frac{2}{3}$ height of nutlets; style very long, much surpassing the nutlets, about twice the length of gynobase.—Anal. Univ. Chile cxxi. 831 (1908) and Fl. Chile v. 236 (1910). *Eritrichum hispidum* Fl. Atac. 38 (1860) and Viage Des. Atac. 44 and 212 (1860).

CHILE. ATACAMA: Quebrada de Doña Ines Chica, Dept. Chañaral, Jan. 1886, *Gigoux* (G). ANTOFAGASTA: Alto de Varas, Dept. Taltal, 3700 m. alt., 1854, *Philippi* (MS, TYPE; G, photo.).

After *C. phaceloides*, from which species it is scarcely separable, the closest relative of this species is *C. dichita*. It differs from that species in its very much more slender habit and smaller flowers and leaves. Although all the material I have seen falls readily and definitely into one or the other of these two species, I should not be surprised if future collecting gave reason for treating *C. dichita* and *C. hispida* as subordinate to *C. phaceloides*.

4. **C. phaceloides** (Clos) Reiche. Annual, 1.5–3 dm. tall, hirsute, stiffly erect, loosely branched; leaves linear, rather few, 1–2 cm. long, 2–3 mm. broad, ascending, hirsute and pustulate; spikes geminate or ternate, spreading, 6–12 mm. long, bractless, densely flowered; fruiting calyx ovate, ca. 4 mm. long, with a short coarse pedicel; mature calyx-lobes lanceolate to linear, erect, appressed hispid and hirsute along the weakly prominent midrib; corolla 4–5 mm. broad, white; fruit 4-ovulate; nutlets 4, slightly heteromorphous with the axial one a trifle the largest, brown and somewhat mottled, oblong-lanceolate, 3.5–3.8 mm. long, ca. 1.5 mm. broad, apex acute, base obtuse, edges acute, back low-convex, groove closed with a small areola at the acute basal forking; gynobase $\frac{2}{3}-\frac{3}{4}$ height of nutlets; style shortly surpassing the odd nutlet.—Anal. Univ. Chile cxxi. 813 (1908) and Fl. Chile v. 218 (1910). *Eritrichium phaceloides* Clos in Gay, Fl. Chile iv. 468 (1849), not tab. 52 bis! *Krynitzkia phacelioides* F. & M. acc. F. Ph. Cat. Pl. Chile 211 (1881); Gray, Proc. Am. Acad. xx. 280 (1885).

CHILE: no locality given, *Gay* (G, frag. of the TYPE).

I know this species only from the original description and from some fragments (a leaf and a spike with mature fruit and flowers),

apparently from the type, sent me through the courtesy of Professor H. Lecomte. The material is without precise locality-data. When the species was published, however, it was said to grow "en Copiapo." The region immediately about Copiapó and especially that just to the south and west has been quite well explored botanically, yet the species does not appear to have been rediscovered. It is not improbable that Gay got the specimens on his journey through the cordilleras southeast of Copiapó. The species is extremely close to *C. hispida* which grows in the cordilleras in the northern part of the Province of Atacama. The plant described above is not that illustrated by Gay. A comparison of the original description of *C. phaceloides* with the plant subsequently illustrated as that species is sufficient to demonstrate that two species are concerned. The plant illustrated as *E. phaceloides* is obviously a member of the section *Geocarya* and is apparently that which I have described as *C. Gayi*.

5. **C. albida** (HBK.) Johnston. Annual, 1–3 dm. tall; stems erect or loosely ascending, solitary or several, subsimple or paniculately branched above, very leafy, finely ashy-hispid; pubescence usually appressed below and spreading above; leaves narrowly oblanceolate or spathulate to linear, obtuse, appressed-hispid and somewhat pustulate, reduced up the stem but extending through the inflorescence as linear bracts; lower and middle cauline leaves 2–7 cm. long, 1.5–4 mm. broad; spikes solitary, numerous, loosely bracted, 1–7 cm. long, becoming remotely flowered; fruiting calyx ovate, 2–3 mm. long, subsessile, tardily deciduous; mature calyx-lobes ovate-oblong to narrowly lanceolate, acute, loosely connivent, margins appressed-hispid, midrib somewhat prominent and short-hirsute; corolla white, inconspicuous, ca. 2.5 mm. broad; fruit 4-ovulate; nutlets usually 4, homomorphous with the abaxial one subpersistent, triangular-ovate, 1–1.5 mm. long, broadly tuberculate and usually somewhat granulate, rather thick, not crowded, touching one another only close to the gynobase and hence individually separated by an obvious sinus, apex acute, base truncate or obtuse, back convex, sides straight and deep, ventrally with a large open triangular areola which appears to be excavated at maturity through the breaking away of the attachment-surface from the nutlet-walls; gynobase narrowly pyramidal, a little shorter than the nutlets; style much surpassing the nutlets.—Contr. Gray Herb. lxviii. 53 (1923); Johnston, Contr. Gray Herb. lxxiv. 42 (1925). *Myosotis albida* HBK. Nov. Gen. et Sp. iii. 91 (1818). *Lithospermum ramosum* Lehm. Asperif. ii. 328 (1818). *Eritrichium ramosum* A. DC. Prodr. x. 132 (1846). *Krynitzkia ramosa* Gray, Proc. Am. Acad. xx. 274 (1885). *C. ramosa* Greene, Pittonia i. 115

(1887). *E. hispidum* Buckley, Proc. Acad. Philad. 1861, pg. 462 (1861). *E. falcatum* Hieron. [Sertum Sanjuan.] Bol. Acad. Nac. Cient. Cordoba iv. 64 (1882). *C. falcata* Johnston, Contr. Gray Herb. lxviii. 54 (1923). *K. mexicana* Brandg. Zoe v. 182 (1904). *C. argentinica* Brand in Fedde, Repert. xx. 318 (1924).

ARGENTINA. CATAMARCA: sand, El Suncho, Dec. 26, 1916, *Jörgensen 1810* (G). LA RIOJA: Cuesta de la Puerta de Piedra, Sierra Velasco, Jan. 8–11, 1879, *Hieronymus & Niederlein 16* (G, fragment of TYPES of *E. falcatum* and *C. argentinica*). JUJUY: La Guiaca, Feb. 1916, *Hauman* (G).

I have been quite unable to separate the Argentine plant from the better known one of Mexico. The matter of leaf-breadth which Brand gives as separating them is hopelessly inadequate. The habit, flowers and the fruiting structures agree surprisingly and I doubt if there are characters that will separate the Mexican from the Argentine material.

It seems that *C. argentinica* Brand and *E. falcatum* Hieron. are clearly synonymous. The first collection cited by Brand and apparently that which he considers the type of his *C. argentinica* is *Hieronymus & Niederlein 16* from the Sierra Velasco in La Rioja. The type is in the Berlin herbarium. The specimen of this same collection in the herbarium of the University of Cordoba, Argentina, must be considered the type of *E. falcatum*, for as Dr. C. C. Hosseus, *in lit.*, has emphasized to me Hieronymus definitely stated in publishing his species that he had used the material from the Sierra Velasco in drawing up his description since the other collection (that made by Echegaray at Leoncito in San Juan), which he referred to the species, was imperfect. Brand used the name *C. falcata*, apparently for a different species, but for which one I do not know.

6. **C. diplotricha** (Ph.) Reiche. Annual, 1–1.5 dm. tall; stems several, erect, frequently somewhat decumbent at base, appressed-hispid and sparsely hirsute with short pallid hairs; leaves linear or spathulate-linear, 1–2 cm. long, 1.5–3 mm. broad, appressed short-hispid, somewhat pustulate, reduced up the stem but extending through the inflorescence as bracts; spikes solitary or rarely geminate, bracted, 1–4 cm. long, very numerous, congested; fruiting calyx ovate, ca. 2.5 mm. long, very hispid, subsessile; mature calyx-lobes lanceolate, erect or loosely connivent; corolla white, inconspicuous, tubular, ca. 0.8 mm. broad; fruit 4-ovulate; nutlets usually 4, homomorphous with apparently a slight emphasis on the abaxial one, lucid, triangular, dark with light-colored tuberculations or wrinkles, 1–1.5 mm. long, readily deciduous, crowded and closely juxtaposed with no open sinus between the individual nutlets, apex acute and slightly recurving, base trun-

cate, sides sharply margined, back usually convex; groove open or closed above but below expanded broadly into a shallow open triangular areola; gynobase subulate, about equalling length of nutlets; style clearly surpassing the nutlets.—Anal. Univ. Chile cxxi. 821 (1908) and Fl. Chile v. 226 (1910). *Eritrichium diplotrichum* Pl. Cat. Pl. Itin. Tarapaca 57 (1891). *E. diplotrichum*, var. *humilis* Ph. l. c. *C. diplotricha*, var. *humilis* Reiche, l. c. *E. axillare* Ph. l. c. *C. axillaris* Reiche, l. c. *C. modesta* Brand in Fedde, Repert. xx. 48 (1924).

ARGENTINA. Los Andes: between Antofagasta and Calalaste, 3600 m. alt., Jan. 1885, *F. Philippi* (MS, type of *E. diplotrichum;* G, photo); Breas, Jan. 1885, *F. Philippi* (MS, type of *E. diplotrichum*, var. *humilis;* G, photo.); between Breas and Salar, Jan. 1885, *F. Philippi* (MS, type of *E. axillare;* G, photo.). La Rioja: Tambillos, 1600 m. alt., *Hosseus 1711* (G, part of type of *C. modesta*).

Most related to *C. albida* but clearly different, particularly as to fruit. Both Brand and Reiche have placed the species in the section *Eucryptantha*, accrediting it with cleistogamic flowers. I have searched for closed-flowers but have been quite unable to find any. The corollas are small and tubular, however, and perhaps might be mistaken for cleistogamic ones if not examined under high magnification.

7. **C. parviflora** (Ph.) Reiche. Slender annual, 3–20 cm. tall; stems commonly one, usually loosely branched from near base, very leafy, more or less abundantly appressed chalky-hispid and frequently also somewhat spreading short-hirsute; leaves linear, 5–40(–50) mm. long, 1–2 mm. broad, appressed-hispid or spreading short-hirsute, somewhat pustulate beneath, weakly reduced up the stem and in plants beginning to fruit somewhat obscuring the spikes; spikes solitary or geminate, 1–5(–7) cm. long, numerous, bractless except for a leafy bract at base; fruiting calyx ovate or oblong-ovate, 1.5–2 mm. long, sessile, readily deciduous; mature calyx-lobes lanceolate or lance-oblong, connivent, densely short-hirsute; corolla minute, subtubular, 0.3–0.5 mm. broad, white; fruit 4-ovulate; nutlets usually 4, heteromorphous, ovate or triangular-ovate, dark with pale tuberculations or broad murications, apex acute, base rounded, back convex, edges sharply margined, groove usually closed above but below dilated into a shallow triangular areola; odd-nutlet abaxial, largest and most persistent, ca. 1 mm. long; consimilar nutlets 0.6–0.8 mm. long, readily deciduous; gynobase ca. $\frac{2}{3}$ height of odd-nutlet; style much surpassing odd nutlet, a little shorter than the gynobase.—Anal. Univ. Chile cxxi. 821 (1908) and Fl. Chile v. 226 (1910). *Eritrichum parviflorum* Ph. Fl. Atac. 39 (1860) and Viage Des. Atac. 10 and 213 (1860). *E. microphyllum* Ph. Cat. Pl. Itin. Tarapaca 57 (1891). *C. micro-*

phylla Reiche, l. c. 828 and l. c. 233. *C. piscoensis* Brand in Fedde, Repert. xx. 49 (1924). *C. umbelliformis* Brand, l. c. 317. *C. Seleri* Brand, l. c. 317.

CHILE. ATACAMA: Chañarcillo, Sept. 1876, *no collector given* (MS; G, photo.); Bandurrias, *Geisse* (MS); Desert of Atacama [? *Bandurrias*], *Geisse 58B* (NY); Atacama Desert, 1884, *San Roman* (MS; G, photo.); gravel, hills north of Copiapó, 800 m. alt., *Johnston 5026* (G); Caldera, Dec. 1853, *Philippi* (MS, TYPE of *E. parviflorum;* G, photo.); coastal dunes, Caldera, *Johnston 5059* (G); gravelly bench near Caleta Pan de Azucar, *Johnston 5837* (G). ANTOFAGASTA: dry slope, Sierra Esmeralda, *Johnston 5681* (G). TARAPACÁ: Chismisia, March, 1885, *Rahmer* (MS, TYPE of *E. microphyllum;* G, photo.).

PERU. MOQUEGUA: hills southeast of Moquegua, 1500–1600 m. alt., *Weberbauer 7398A* (G, FM). AREQUIPA: open sandy and rocky slopes, Tingo, 2100–2300 m. alt., *Pennell 13112* (G, FM); open gravelly slope above Arequipa, 2500 m. alt., *Pennell 13177* (G, FM); Yura, 1884, *Borm* (G). ICA: slopes above Pisco, 1200–1300 m. alt., *Weberbauer 5375* (G, part of TYPE of *C. piscoensis*). LIMA: open rocky slope, Quive, 800–1000 m. alt., *Pennell 14300* (G); mountains near Chosica, 1500 m. alt., *Weberbauer 5337* (FM, ISOTYPE of *C. umbelliformis*).

This species, while evidently distinct, is very closely related to the North American *C. angustifolia* (Torr.) Greene and *C. Grayi* (V. & R.) Macbr., cf. Contr. Gray Herb. lxxiv. 31 and 38–40 (1925). All the material cited above has heteromorphous nutlets with the abaxial one evidently the largest and most persistent. In this fact as well as in general form and appearance of the nutlets, the present species agrees closely with *C. angustifolia*, though in size of parts and general aspect it is much nearer *C. Grayi*.

I have been quite unable to separate specifically the Chilean and Peruvian plants. In a very general way it can be said that the Peruvian specimens are somewhat more strictly branched and more leafy particularly above. These, however, are but vague differences and, perhaps, hardly more than an impression. The type and only known collection of *E. microphyllum* unquestionably belongs here. The specimen is a poor one, with numerous simple flagellate branches and linear leaves ca. 6 mm. long. In habit it very much suggests *C. pusilla* (T. & G.) Greene, of North America. The nutlets are clearly heteromorphous. I have seen no authentic material of *C. Seleri* but assume it to be the hispid plant collected by Pennell and Borm in the vicinity of Arequipa. *Cryptantha umbelliformis* I believe to be merely a young state of the same form. *Cryptantha piscoensis* has an appressed pubescence and is a somewhat coarser form. It has been collected at Quiva by Pennell.

Possibly representing a distinct species in my own collection, no. 6281, from a dryish bench just below the fertile belt in the hills back

of Mollendo, Peru. This plant definitely has homomorphous nutlets. Though the nutlets are all consimilar, the abaxial one is more firmly attached to the gynobase than are the others. In other than the homomorphy of its nutlets the plant is quite like the Peruvian forms of *C. parviflora.* It has the appressed pubescence and the slightly coarse habit of the type of *C. piscoensis.*

8. **C. subamplexicaulis** (Ph.) Reiche. Perennial or persistent annual with a firm branching root, erect and subsimple at first but later with several or many trailing branches from a loose fruticulose caudex and forming a loose prostrate mat 3–12 dm. broad and 1–2 dm. tall, hispid or hispid-villous and usually appressedly so and canescent; leaves linear to linear-lanceolate or oblong-lanceolate, 1–4 (–5) cm. long, 2–4(–5) mm. broad, acutish, sessile by a broad usually cordulate or rounded base, more or less pustulate; spikes solitary or geminate, bractless, 3–12 cm. long, becoming remotely flowered; fruiting calyx ovate or ovate-oblong, 3–5 mm. long, contracted below into a short stout and angled pedicellate base; mature calyx-lobes lanceolate or linear, erect with tips more or less spreading, densely or at times sparsely appressed hispid-villous, the midrib prominent below middle and more or less hirsute; corolla evident, 5–6 mm. broad, white; fruit 4-ovulate; nutlets 4, homomorphous or somewhat heteromorphous with the axial nutlet (always the most persistent) slightly the largest and dullest, 1.5–1.9 mm. long, tuberculate or papillate, obscurely granulate, sometimes sparsely stipitate-glandular, apex acute, base truncate or obtuse, sides angled, back convex or obscurely obtuse; groove narrow or closed, usually with a small areola at the broad basal fork; gynobase $\frac{2}{3}$–$\frac{3}{4}$ height of nutlets; style very much surpassing the nutlets and about twice length of gynobase.—Anal. Univ. Chile cxxi. 826 (1908) and Fl. Chile v. 231 (1910). *Eritrichum subamplexicaule* Ph. Fl. Atac. 39 (1860) and Viage Des. Atac. 25 and 213 (1860).

CHILE. ANTOFAGASTA: dry shrubby hillside, Cerro Perales near Taltal, *Johnston 5633* (G); Paposo, Dec. 1853, *Philippi* (MS, TYPE; G, photo.); fertile belt on west slope of Cerro Yumbes, Paposo, *Johnston 5562* (G); slopes in fertile belt, El Rincon just north of Paposo, *Johnston 5543* (G); grassy slope in fertile belt above Aguada Panulcito, *Johnston 5475* (G); sheltered places, Aguada Panul, *Johnston 5448* (G); moist bench in quebrada, Aguada de Miguel Diaz, *Johnston 5416* (G); dune slope just southwest of Aguada de Miguel Diaz, *Johnston 5412* (G); dune slope just back of Punta Reyes below Aguada de Miguel Diaz, *Johnston 5411* (G).

A well marked species in its typical form, characterized by its very remarkable habit. The plant grows on the fog-bathed middle slopes of the hills fronting the sea. The long branches trail through the