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xvii. 225, I had too confidently guessed this little plant to be the *Cynoglossum ciliatum* of Douglas, which is possibly a congener, but for the present is taken for an *Echinosperrum*. But Mr. Canby, by collecting the fruit, has made it clear that the present plant is, as its habit would denote, a congener of *O. nana*. As far as known, the present species has the edentate nutlets of *O. rupestris*, especially of the form which Maximowicz named *Eritrichium Maackii*; but from its analogy with that species we may expect varieties with more or less pectinate teeth on the angled border.*

KRYNITZKIA, Fisch. & Meyer, ampliata.

Corolla rotata vel hypocraterimorpha, tubo brevi calycem (fructiferum erectum vel vix patentem) rarissime superante. Stamina inclusa. Nuculæ erectæ et rectæ, nudæ, rarove angulis lateralibus patenti-alatis, intus basi tantum vel altius vel ad apicem usque gynobasi nunc parum nunc longe elevatæ adfixæ; areola pl. m. impressa vel sulco insertionis prorsus nuda. — Herbæ annuæ vel paucæ perennes, plerumque Occidentali-Americanæ, floribus albis sæpissime parvis. — *Krynitzkia*, Fisch. & Meyer, Ind. Sem. Hort. Petrop. vii. (1841) 52. *Krynitzkia* & *Eritrichium* sect. v.–vii., A. DC. Prodr. x. 128–134. *Eritrichium* § *Krynitzkia*, § *Eueritrichium Myosotideæ*, & *Antiphytum*, Gray, Proc. Amer. Acad. x. 55, & Syn. Fl. ii. 191–197, 199.

§ 1. AMBLYNOTUS. Nuculæ (lithospermoideæ) *cartilagineæ* vel *crustaceæ*, ovatæ, dorso (una excepta) rotundatæ, intus basi aliquandoque paullo altiore gynobasi convexæ vel depresso-pyramidatæ adfixæ.

* *O. RUPESTRIS* (*Myosotis rupestris*, Pall., *Eritrichium rupestre*, DC.) would be the proper name of this N. Asiatic species, which, according to Maximowicz (Diagn. Dec. xi. 546), includes also *E. pectinatum*, DC., as a form with pectinately fringed border to the nutlets. Herder keeps up two species, but apparently refers too many Himalayan forms to the latter.

O. VILLOSA. *Eritrichium villosum*, A. DC. Prodr. x. 126, cum syn. *E. latifolium*, Ruprecht? Herder's reference to this as found on our Rocky Mountains was caused by taking the name from S. Watson, who (in Bot. King, 240) followed Hook. f. in his Memoir on Arctic Plants. Some forms of *O. nana* do indeed much resemble *O. villosa*.

O. SCHRENKII = *Echinosperrum rupestre*, Schrenk in "Bull. Acad. Petrop. ii. 194," & DC. Prodr. x. 140. This has the habit of *O. rupestris*, and, although anomalous, should go with it rather than into *Echinosperrum*. The nutlets are quite erect, indeed, but their narrow wing is strictly turned over upon the back, and the few and short teeth which it bears are not at all glochidiolate.

* Species Boreali-Asiatica, facie *Omphalodium* § *Eritrichii* regionis, perennis: nuculæ læves, dorso rotundato carina obsoleta, ventre carina acuta instructa, areola insertionis rotundata. — *Eritrichium* § *Amblynotus*, A. DC. Prodr. x. 128.

K. OBOVATA. *Myosotis obovata*, Ledeb. *Eritrichium obovatum*, A. DC. l. c.

** Species Californica, annua, *Krynitzkiis typicis* facie referens: nuculæ lævissimæ, nitidæ, dorso carina prominula ventre sulco angustissimo percursæ, areola insertionis brevi-lineari sulciformi a basi ad quartem partem attingente.

K. LITHOCARYA, Greene, ined. — Lakeport, Lake Co., California, 1884, *Mrs. Layne-Curran*.

*** Species Texano-Mexicanæ, anomalæ, ramosæ, caulibus basi pl. m. indurata diu persistente vix perennantes: nuculæ turgide ovatæ, dorso latæ omnino rotundatæ, papulis undique asperatæ, intus acute carinatæ, basi parum protuberante areola rotundata adfixæ. — *Antiphytum*, A. DC. pro parte; Gray, Proc. Am. Acad. x. 54, & Syn. Fl. ii. 199.

Antiphytum, as founded by De Candolle upon Mocino's drawing of a Mexican species, is utterly obscure; as propounded by him in Meissner's work it is apparently a good genus for Brazilian species with opposite leaves, for which Bentham re-establishes it. But the following species, as Bentham indicated, must be allowed to fall into the present genus. Although somewhat peculiar in habit, it comes well into the present section as now extended.

+ Sat elatæ, paniculatæ.

K. HELIOTROPIOIDES. *Antiphytum heliotropioides*, A. DC. Prodr. x. 122; Gray, l. c. *Eritrichium heliotropioides*, Torr. Bot. Mex. Bound. 140.

K. FLORIBUNDA. *Eritrichium floribundum*, Torr. l. c. *Antiphytum floribundum*, Gray, l. c. — Corolla fauce nuda.

+ + Humilis, condensata; foliis parvis.

K. PARRYI. *Antiphytum Parryi*, Watson, in Proc. Am. Acad. xviii. 122. — Between San Antonio, Texas, and San Luis Potosi, Mexico, coll. *Parry*, no. 618, in part.

§ 2. MYOSOTIDEA. Nuculæ basi intus areola brevissima vel brevi gynobasi depressæ vel parum elevatæ adfixæ, pl. m. ovatæ, rugosæ, opacæ, parum induratæ, ventre sæpius dorso quandoque carinatæ. Herbæ humiles, sæpius tenellæ. — *Eritrichium* § *Eueritrichium Myosotidea*, Gray, l. c.

* Annua.

+ Sæpius diffusæ, parvifloræ; corolla calycem parum superante, limbo vix ultra lineam lato; sepalis quandoque post anthesin foliosampliatis.

K. PLEBEIA. *Lithospermum plebeium*, Cham. & Schlecht. *Eritrichium* (*Rutidicaryum*) *plebeium*, A. DC. Prodr. — Aleutensis: caules laxi ad apicem usque foliati.

K. CALIFORNICA. *Myosotis Californica*, Fisch. & Meyer. *Eritrichium Californicum*, DC. Nuculæ ovato-oblongæ, rugis obtusis parvis notatæ, læves vel scabriusculæ. — In the alkaline wet soil which this species affects, the herbage is apt to become succulent and the calyx accrescent. Such forms especially pass into the notable

Var. SUBGLOCHIDIATA. Nuculis scabridis vel subtuberculatis aut parce aut insigniter hirtellis, setulis sæpe fasciculatis (nunc basi in fasciculum coalitis) apice vel simplicibus vel furcatis vel penicillatis etiam subglochidiatis. — *Eritrichium Californicum*, var. *subglochidiatum*, Gray, Syn. Fl. ii. 191. The specimens of Watson and others from the Great Basin and eastward are mostly of this variety; but it also occurs in the valley of the Sacramento, &c., both in succulent and unaltered forms.

+ + Laxæ, corollæ limbo lin. 1–2 lato, nuculis asperato-rugosis.

K. TRACHYCARPA. Erecta vel diffusa, facie præcedentis; foliis inferioribus sæpe oppositis; nuculis late ovato-trigonis rugis crebris reticulatis acutis hinc inde muricatis pl. m. asperatis nunc inter rugas sæpius granulatis; areola insertionis oblonga. — California in Sonoma Co., Brewer, and San Joaquin Valley, Greene. I have this in a depauperate form from a Chilian collection made near Valparaiso in 1856 by Dr. Harvey, and in a tall form with opposite leaves, quite to the inflorescence in Reed's Chilian collection, named at Kew *Eritrichium uliginosum*, Philippi. Wherefore it may be suspected to be the *Lithospermum muricatum* of Ruiz & Pavon (*Eritrichium?* *muricatum*, A. DC.), and probably it may have other specific names; none of them, however, can be safely adopted. It is one of the species which connect the present section with *Eukrymitzkia*.*

* The South American species of this section seem to be few, but under several names. They should be worked up by a botanist having access to most of the originals.

K. LINIFOLIA (*Anchusa linifolia*, Lehm., *A. oppositifolia*, HBK. in the same year, *Antiphytum linifolium*, DC., and *Eritrichium linifolium*, Weddell) is the Andean species with wholly or chiefly opposite leaves and radican bases of the tufted

+ + + Floridæ, corollæ limbo ratione calycis majusculo valde rotato-explanato, fornicibus conspicuis; nuculis rugosulis.

K. CHORISIANA. *Myosotis Chorisiana*, Cham. & Schlecht. *Eritrichium Chorisianum*, DC., Gray, Syn. Fl. ii. 191, cum syn. — Pube parca sæpius adpressa; floribus laxè pedicellatis.

K. SCOULERI. *Myosotis Scouleri*, Hook. & Arn. *Eritrichium Scouleri*, A. DC. l. c.; Gray, l. c., cum syn. — Faciè præcedentis, floribus in spicis strictis subsessilibus.

K. COOPERI. *Eritrichium Cooperi*, Gray, Proc. Am. Acad. xix. 89. — Faciè *K. Scouleri*, magis diffusa vel decumbens, setis patentibus hispida. — In the Mohave district, *Cooper, Parish*.

* * Perennans, caulibus decumbentibus basi repentibus radicantibus; pube villosa sat molli; corollæ limbo rotato-patente lin. 3-4 lato; nuculis fere *K. Californicæ*, sed areola insertionis prorsus introrsa ovato-lanceolata gynobasi oblongo-pyramidatæ adfixæ.

K. MOLLIS. *Eritrichium molle*, Gray, Proc. Am. Acad. xix. 89. — Wet borders of ponds, Sierra Valley, California, *Lemmon*. A rougher form from near Visalia, *Congdon*. A transition from the present section to *Eukrynitzkia*. The scar usually extends up to nearly one third the length of the ventral face, and the gynobase is correspondingly high; but this varies somewhat, and in *Congdon's* specimen it is shorter.

§ 3. EUKRYNITZKIA. Nuculæ (nunquam rugosæ) angulo vel sulco ventrali ab ima basi nunc fere ad medium nunc apicem usque gynobasi elevatæ adfixæ, dorso convexo nec carinato nec angulato, lateribus obtusis rarove angulato-acutis nunquam marginatis: calyx fructifer erectus vel clausus: corolla parva, tubo brevi calycem haud superante, basi exannulato, fauce aut nuda aut fornicibus haud exsertis instructa. — Herbæ annuæ, floribus plerumque sessilibus scorpioideo-spicatis. — *Eritrichium* § *Krynitzkia*, div. *Eukrynitzkia*, Gray, l. c.

stems. It must include *Eritrichium pygmæum*, Weddell (*Anchusa*, HBK.), and apparently a part of his *E. humile*, such as the var. *congestum*, Mandon's no. 381, to which Weddell's figure answers, except as to the fruit, and which is certainly not Brotero's no. 445, of Chili. The nutlets of *K. linifolia* are attached by an oval or barely oblong scar, and the back is coarsely reticulate-rugose, not at all "granulate-tuberculate."

K. TENUIFOLIA, the "*Eritrichium tenuifolium*, Schlecht." of Lechler's Pl. Chilenses, no. 255, which has nutlets strictly of this group, must, from habitat and character, be the *Eritrichium humile*, var. *capillatum* (misprinted "*capitatum*") of Gay, Fl. Chil., which Weddell refers to as different from *E. humile*. It is quite uncertain what *Myosotis humilis*, Ruiz & Pav., an annual, can be, and what is Lehmann's, described as with a perennial and fusiform fibrillose root.

* HOLOCALYX, i. e. calyx fructifer non circumscissus, basi ipsa vel pedicello brevissimo intermediente rhachi pl. m. articulatus, haud raro cum fructu incluso secedens.

+ *Costatae, Cismontanæ*: sepala nunquam angustissima, costa valida rigida, fructifera in prioribus insigniter incrassata percursa: nuculae sæpissime opacæ, areola intrabasali (*K. Texana* excepta) manifesta: herbæ diffuso-ramosæ, hispidæ, sæpius asperæ.

+ *Hetero- vel Monocaryæ*: calyx fructifer inferne arcte clausus, costis insigniter cartilagineo-incrassatis.

K. CRASSISEPALA. *Eritrichium crassisepalum*, Torr. & Gray, Pacif. R. Rep. ii. 171. — Spicæ inter flores bracteatae. Calyx fructifer in pedicello brevissimo etiam indurato diu persistens. Nuculae ovatae, acutæ, vix ultra medium gynobasi angusto-pyramidatæ adfixæ, tres dorso papilloso-muriculatæ et areola oblongo-lanceolata excavata insertæ; una major, lævis, diu persistens. — This species extends from the Saskatchewan to New Mexico.

K. TEXANA. *Eritrichium Texanum*, A. DC. Prodr. x. 130. — Elatior, spicis demum laxis plerumque ebracteatis. Calyx fructifer angustus costis angustioribus, subsessilia, maturitate fructu incluso secedens. Nucula solitaria (3 abortientibus), sat magna, parum meniscoidea, creberrime minutimque puncticulata, cæterum lævis, ventre a basi fere ad medium carina tenui gynobasi adfixa, diu persistens, delapsa basi lacera.

+ + *Homocaryæ*: nuculae 4 fertiles conformes, gynobasi angustiori adfixæ, læves, ovato-acuminatæ, vix lineam longæ, sulco ventrali ima basi in areolam paullo excavatam subtriangularem repente dilatato: calyx fructifer (lin. 2 longus) minus clausus, setis pungentibus hispidus, costis prominentibus sed minus crassis: spicæ basi tantum bracteatae vel ebracteatae.

K. PATTERSONI. Humilis, a basi diffusa; foliis angusto-spathulatis seu linearibus; sepalis lineari-lanceolatis costa demum prominente: nuculis a basi ad medium (vel paullo ultra) gynobasi subulato-pyramidatæ adfixis, una quandoque magis persistente. — At the base of the Rocky Mountains in Colorado; coll. *H. N. Patterson*, 1875, *J. D. Hooker* and *A. Gray*, 1877. A species till now overlooked, connecting the following with the preceding group.

K. FENDLERI. Erectus, subpedalis, paniculato-ramosus, rigidulus; foliis linearibus; sepalis fructiferis angusto-linearibus; nuculis sursum magis attenuatis fere ad apicem usque gynobasi angusto-subulatæ adfixis. — Along the eastern base of the Rocky Mountains, from the

Saskatchewan district (Hand Hills, *Macoun*) to Colorado, Northern New Mexico, and apparently in Arizona; coll. *Fender, Hall, Parry, Vasey, Porter, Rusby, &c.* It has been unwarrantably confounded with *K. leiocarpa, &c.*

← + *Typicæ, Transmontanæ, Leiocaryæ*: nuculæ lævissimæ, nitidæ, acutæ vel acumiuatæ, pericarpio sat tenui, sulco ventrali tenui percursæ, basi haud vel minime areolatæ, gynobasi angustæ adfixæ: sepala angusta, costa nunc prominula nec incrassata instructa: herbæ diffusæ vel erectæ, graciles, calycibus setoso-hispidis.

↔ *Eremocaryæ*: nucula solitaria (rarissime 2, cæteris abortientibus), angusta, acuminata, inferne triente parte tantum gynobasi brevi angustæ adfixa, itaque sursum longius libera (*Amblynoti* modo), areola intrabasali vix ulla: herbæ graciles, erectæ; spicis sæpius conjugatis ternisve ebracteatis, calycibus fructiferis arcte sessilibus rhachi plerumque adpressis.

K. OXYCARYA. *K. leiocarpa*, Benth. Pl. Hartw. 326, non Fisch. & Meyer. *Eritrichium oxycaryum*, Gray, Proc. Am. Acad. x. 58, & Syn. Fl. ii. 193. *Myosotis flaccida*, Dougl. in Lehm. Pugill. ii. 22, & Hook. Fl. ii. 82; Hook. & Arn. Bot. Beech. 369. Pube brevi strigulosa arcte adpressa subcinerea; caule sæpius stricto ultrapedali; foliis linearibus vel lineari-spathulatis; calyce fructifero (circa lin. 2 longo) segmentis lineari-filiformibus crassiusculis, versus basim setis crebris *deflexis* (validis hæud pungentibus, apice attenuato debili nunc incurvo) hispidissimis, superne nudiusculis vel setis brevioribus instructis; nucula majuscula subtereti ex ovata longius acuminata quasi rostellata. — Not rare from S. California to Washington Territory. When we did not possess specimens north of California, I referred the original *Myosotis flaccida*, described by Lehmann, to *K. leiocarpa*, partly because of the “nucis 4” in the description. But I now learn that original specimens from “barren grounds in the interior of the Columbia” have solitary nutlets, and are of this well-marked species.

K. MICROSTACHYS, Greene in herb. Setis breviusculis patentibus pl. m. hirsuto-hispida; caule ramoso semipedali ad bipedalem; foliis aut angusto- aut lato-linearibus; calyce fructifero lineam ad sesquilineam longo setis subpungentibus longis patentissimis (nec *deflexis*) hispido vel hispidissimo, segmentis minus attenuatis; nucula ovato-lanceolata sensim acuminata ventre parum complanata sulco manifesto ima basi subfurcato percursa. — California, near Tejon, *Xantus*, no. 84, 86 (*K. leiocarpa, & Eritrichium?* spec., Gray, Jour. Bost. Nat. Hist. Soc. vii. 147); Los Angeles, *Nevin*; San Diego, *Pringle* (the

least hispid and narrowest-leaved form, nearly approaching the preceding species, and distributed as *Eritrichium oxycaryum*, coll. April 6, 1882); Colusa Co., 1884, *Mrs. Layne-Curran*, a depauperate and very slender form. The spreading bristly hairs sometimes abound on the stems as well as the leaves.

++ ++ *Eutypica*: nuculæ sæpius 4 fertiles, gynobasi angustæ elevatæ adfixæ, haud areolatæ,

= Intus tota longitudine sulco tenui basi nec furcato nec in areolam explanato percursæ: herbæ humiles, laxæ vel diffusæ, pilosohispidæ; foliis lineari- vel oblongo-spathulatis; spicis cymæ simplicis vel bipartitæ laxifloris vel interruptis basi sæpius foliatis, vel floribus primariis alaribus et pseudo-axillaribus; calycibus fructiferis lin. 2 longis; corollis minimis.

K. LEOCARPA, Fisch. & Meyer, Ind. Sem. 1841, 52; A. DC. Prodr. x. 134. *Echinosperrum leiocarpum*, Fisch. & Meyer, op. cit. 1835, 36. — Nuculæ parvæ (vix ultra semilineam longæ) ovatæ, acutæ, paullo obcompressæ, fere tota longitudine sulci recti gynobasi subulatæ adfixæ. — Western California, from Monterey (where Dr. Parry collected a low and rather stout form, with oblong leaves) northward, probably to Oregon and Washington Territory. But the only determinable specimens in our herbarium, except early cultivated ones, directly or indirectly from the originals raised at St. Petersburg, were collected by Dr. Kellogg on the Californian coast, either near San Francisco or farther northward. Under the name of *Eritrichium leiocarpum*, first used by S. Watson in Bot. King Exped. 244 (who, however, did not collect the genuine plant), three or four smooth-fruited species have been confounded. These may now, upon the re-establishment and extension of the genus *Krynitzkia*, be distinguished mainly by characters of the fruit, which seem to be good, although rather fine. In the present and the following species the slender ventral groove by which the nutlet is attached runs to its very base, without the furcation of the next succeeding species, and without any expansion into a scar.

K. AFFINIS. Nuculæ lineam vel ultralineam longæ, turgidæ, subtriculatæ (pericarpio tenuiori), ad medium usque gynobasi tenuiter pyramidatæ adfixæ, sepalis lineari-lanceolatis aut paullo aut dimidio breviores. — On the eastern side of the Sierra Nevada, California to Washington Terr. and Idaho. The specimens now in hand are: E. side of the Cascades near lat. 49°, *Ljall*, 1860. Beaver Cañon, Idaho, *Watson*, 1880. Falcon Valley, Washington Terr., *Suksdorf*,

1880. Oregon, without locality, *Howell*. Near Donner Lake, *Torrey*, 1865. Strong's Cañon, near Truckee, *Mrs. Layne-Curran*, 1884. It has, with others, passed under the name of *Eritrichium leiocarpum*, and in appearance is most like the original *Krynitzkia*.

— = Nuculæ faciebus interioribus fere planis exteriori convexiuscula pl. m. trigonæ, angulo interiori sulco tenui juxta basim divaricato-furcato sed clauso: herbæ erectæ, sæpe pedales; spiciis cymæ bene evolutæ (simplicis vel conjugatæ) ebracteatis.

K. TORREYANA. *K. leiocarpa*, Torr. Bot. Mex. Bound. 142, at least in part. *Eritrichium leiocarpum*, Watson, Bot. King Exped. 244, in large part; Gray, Proc. Am. Acad., & Syn. Fl. ii. 194, in large part and by char., excl. syn. Fisch. & Meyer and Dougl. — Hirsutohispida; calyce (præter pubem villosam) setis pungentibus patentissimis hispido, fructifero sepalis sursum attenuatis; corollæ pl. m. exsertæ limbo lin. 1–2 lato; nuculis (lineam longis) ovatis acutis usque ad medium tantum gynobasi subulato-pyramidatæ adfixæ. — Nearly throughout California, and east to Nevada and southwestern parts of Idaho. This species, now distinguished from its allies, may well bear the name of Dr. Torrey, who was an early investigator of this group, and who himself more than once collected it, whether or not it be the one he had mainly in view as *K. leiocarpa* in his references in Bot. Mex. Boundary, &c. But what he so called in Pacif. R. Rep. iv. 124 is *K. ozycarpa*. The calyx varies in length, &c., evidently passing into

Var. CALYCOSA. Forma sæpius robusta, congestiflora; sepalis calycis fructiferi pl. m. elongato-attenuatis lin. 2–3 longis rigidulis, costa validiori. *Eritrichium leiocarpum*, Watson, Bot. King Exped. l. c., quoad "calyx-lobes linear, becoming much elongated." — E. Humboldt Mountains, Nevada, *Watson*, and a form approaching it, coll. in Nevada by *J. D. Hooker* and *A. Gray*, 1872. Lake Co., California, *V. Rattan*, 1884, a form seemingly abnormal by the capitate-congested inflorescence and much prolonged sepals.

K. WATSONI. Minus hispidula, gracilis; sepalis calycis fructiferi vix lin. 2 longi parce setoso-hispidi lanceolatis parum attenuatis; corolla parva; nuculis (lineam longis) angustis subtriquetris circumscriptione fere oblongo-lanceolatis tota fere longitudine gynobasi filiformi-subulatæ adfixis. — Wahsatch Mountains, Utah, at 6,000 feet, *S. Watson*, 1869, a part of *Eritrichium leiocarpum*, Bot. King Exped. l. c.

↔ ↔ ↔ *Asperulæ Anisocaryæ*: nuculæ sat angustæ, punctis creberrimis scabræ, sæpius heteromorphæ, ventre sulco inferne ampliatio

fere tota longitudine gynobasi subulatæ adfixæ: herbæ diffusæ, parvifloræ; spicis bene evolutis ebracteatis; calycibus fructiferis (haud ultra semilineam longis) setis validis divaricatis pungentibus armatis.

K. ANGUSTIFOLIA. *Eritrichium angustifolium*, Torr. Pacif. R. Rep. v. 363 & Bot. Mex. Bound. 141. Humilis, demum ramosissima diffusa; foliis linearibus; setis calycis fructiferi eo vix brevioribus; nuculis scabridis subtrigonis, sulco infra medium vel juxta basim subdeltoideo-ampliato, aut fere homomorphis aut sæpius 2 vel 3 triangulari-ovatis et 1 vel 2 longioribus angustioribus circumscriptione ovato-lanceolatis, brevioribus quandoque abortivis. — This species is characteristic of the Mohave Desert, but it extends into Arizona as far as to Tucson. And from insufficient specimens sent in 1884 by Suksdorf, from Morgan's Ferry, Yakima River, it would appear to have made its way northward even to Washington Territory.

K. DUMETORUM, Greene in litt. Laxe ramosa, in dumetis quasi scandens; foliis ramealibus oblongis seu lanceolatis papilloso-hispidis; sepalis fructiferis lanceolatis; nuculis angustis acuminatis hirtello-scabris heteromorphis, 3 oblongo-lanceolatis subteretibus ventre sulco aperto infra medium latiore, una multo majore ovato-lanceolata in gynobasi subulata persistente calycis segmentis 2 ultra medium in unicum coalitis arcte fulcrata! — Southern California, at the Tehachapi Pass, *Mrs. Layne-Curran*, coll. 1884. The examination of the single fruiting branch received shows this to be a peculiar species, of evident relationship to the foregoing. The fruiting calyx is distorted or made gibbous at base by the enlargement of the persistent akene (of fully a line in length), round which the two united subtending sepals are half wrapped. More specimens are desirable for ascertaining if these peculiarities are constant.

++ ++ ++ ++ *Trachycaryæ Ebracteate*: nuculæ homomorphæ, ovato-trigonæ, dorso præsertim papillis acutis muricatæ vel scabratæ, ad apicem vel subapicem usque sulco longo basi aut furcato clauso aut in areolam pl. m. dilatato gynobasi subulatæ adfixæ; herbæ plerumque erectæ, hispidæ; spicis fructiferis rite evolutis ebracteatis; calycibus setis pungentibus patentissimis hispidis.

= Calycis fructiferi sepala 4-2 lin. longa, attenuato-lineararia, costa prominula percursa, nuculas acutas vel acuminatas longe superantia.

a. Herbæ insigniter villosa-hispidæ, id est setis pilisque gracillimis plerumque albis barbata.

K. BARBIGERA. *Eritrichium barbigerum*, Gray, Syn. Fl. 194. Sat robusta, a basi ramosa; spicis elongatis. Calyces fructiferi majusculi, lin. 3-4 longi, subpedicellati, sepalis haud raro apice parum dilatatis. Corolla limbo lin. 1 vel 2 diametro. Nuculæ (1-2 vel 2-3 rarissime 4 fertiles) ovatæ, apice subacuminatæ, scabro-muricatæ, griseæ, sulco basi in areolam parvam triangularem desinente nec in furcam producto. — We have it only from the southern parts of California and the adjacent western part of Arizona. This and the two following species are either confluent or hard to define.

b. Sepala fructifera minora (lin. 2-3 longa), setis rigidis albidis seu flavescensibus hispida, cum vel sine pube brevi: corolla limbo lin. 1-3 lato: caulis passim 1-2-pedalis.

K. INTERMEDIA. *Eritrichium intermedium*, Gray, Proc. Am. Acad. xvii. 225. Nuculæ oblongo-ovatæ, pl. m. acuminatæ, crebre asperato-muricatæ, sulco latusculo nunc fere ad apicem aperto. — Only in the southern part of California, from Los Angeles and San Diego to the Mohave district. There is a small-flowered and a larger-flowered form.

K. AMBIGUA. *Eritrichium muriculatum*, Torr. in Wilkes Exped. xvii. t. 13. *E. angustifolium*, Watson, Bot. King Exped. 241, non Torr. *E. muriculatum*, var. *ambiguum*, Gray, Syn. Fl. ii. 194. Nuculæ deltoideo-ovatæ, pl. m. acuminatæ, scabrido-muricatæ, sulco sæpius inferne aperto basi divaricatim furcato. — Not uncommon from Southern California to Oregon, the interior of Washington Territory, Nevada, and apparently N. Arizona.

— = Calycis fructiferi ovalis vel oblongi sepala lanceolata, sesquilineam vel haud ultra lin. 2 longa, nuculus minus superantia; costa obscura, setis fulvis.

K. MURICULATA. *Myosotis muricata*, Hook. & Arn. Bot. Beech. 369. *Eritrichium muriculatum*, A. DC. Prodr. x. 132; Gray, l. c. Sat robusta, 1-2-pedalis, vel minor gracilior; cymis rite evolutis sæpius 2-3-radiatis, spicis densifloris; corollæ limbo lin. 1-2 lato; nuculis lineam longis circumscriptione deltoideo-ovatis obtusis vel acutiusculis scabro-muricatis, sulco tenui basi divaricato-furcato plerumque clauso. — Nearly throughout California, extending to Washington Territory. The plant of Douglas, on which the species was founded by Hooker and Arnott, is one of the stouter forms, too young for well making out the fruit. In Proc. Am. Acad. x. 59, I inadvertently took it to belong to *Plagiobothrys canescens*.

K. JONESII. *Pedalis, gracilis*; caule stricto cum ramulis brevibus spicigeris sæpius plurimis lateralibus racemoso-paniculatis; foliis parvis angusto-linearibus; calycibus fructiferis haud ultra sesquilineam longis setis paullo brevioribus armatis; nuculis ovato-trigonis obtusis (semilineam longis) aspero-muriculatis, sulco ventrali basi furcato clauso; stylo crassiusculo breviter exserto. — Bay of Monterey, California, at Soledad and at Santa Cruz, *Marcus E. Jones*, 1882. Lower California near the U. S. boundary, *C. R. Orcutt*, no. 1022, 1884. — Differs from the preceding, not only in the smaller size of the parts, but in the usual character of the inflorescence. Resembles rather Bertero's no. 1157 of Chili, *K. clandestina* (*Eritrichium clandestinum*, A. DC., &c.); but it has different nutlets and no cleistogamous flowers.

— — — Calyx fructifer vix lineam et nuculae $\frac{1}{2}$ -lineam longæ.

K. MICROMERES. *Eritrichium micromeres*, Gray, Proc. Am. Acad. xix. 90. *E. angustifolium*, Gray, Proc. Am. Acad. v. 165, non Torr., &c. Subpedalis, hispidula, erecta, diffuso-ramosa; foliis parvis; spicis filiformibus; floribus minimis; sepalis lanceolatis obtusiusculis; nuculis ovato-trigonis acutiusculis acutangulis nitidulis dorso muriculatis, faciebus internis sæpius concavis lævibus, sulco ventrali basi subito dilatato. — California, at Santa Cruz, *Marcus E. Jones*, 1881. Lower California at Cape San Lucas, *Xantus*, 1860.

++ ++ ++ ++ ++ *Trachycaryæ Sparsibracteata*: nuculae breves, lato-trigonæ, dorso papillis sparsis muricatae, intus areola sat magna triangulari gynobasi pyramidatae acutæ adfixæ, supra medium liberæ, carina parum sulcata: stylus vix exsertus: spicæ pl. m. bracteatae: calyx fructifer vix ultra-lineam longus, setis haud pungentibus breviusculis hispidus; sepalis lanceolatis, costa obscura: corolla minima: herbæ diffuso-ramosæ, humiles, Texano-Mexicanæ; foliis parvulis plerumque linearibus.

K. PUSILLA. *Eritrichium pusillum*, Torr. & Gray, Pacif. R. Rep. ii. 171. Hispidula, parvula, a basi diffusa; spicis elongatis densifloris bracteis minimis hinc inde instructis; nuculis nitidulis haud semilineam longis, dorso papilloso convexo, angulis lateralibus acutis, faciebus internis arcte concavis lævissimis, areola intrabasali deltoidea parum excavata. — Fine specimens of this well-marked species have been recently collected at Fort Davis, S. W. Texas, by *Dr. Girard*.

K. RAMOSA. *Lithospermum ramosum*, Lehm. Asperif. 328. *Myosotis alba*, HBK. Nov. Gen. & Spec. iii. 91. *Eritrichium ramosum*, A. DC. Prodr. x. 132. *E. hispidum*, Buckley in Proc. Acad. Philad.

1861, 492; Gray, Proc. Am. Acad. x. 59, & Syn. Fl. ii. 195. *E. heliotropioides*, Torr. Bot. Mex. Bound. 140, pro parte, excl. syn. *Amsinckia* spec., Benth. Pl. Hartw. no. 157. — Hispida, e caule sæpius erecto solute ramosa; spicis folioso-bracteatis, fructiferis laxifloris; nuculis ($\frac{3}{4}$ lin. longis) opacis obtuse papillatis lateribus rotundatis, areola insertionis triangulari ampla excavata. — As this species extends well into Mexico, and accords with both Lehmann's and Kunth's accounts (published in the same year), the specific name under which the former found it in Willdenow's herbarium is here restored. [This identification is confirmed by Dr. Eichler, through a reference to the original specimens of Humboldt in the Berlin herbarium.]

++ ++ ++ ++ ++ ++ *Crebribracteata*, parvulæ, pube tenui: nuculæ ovato-lanceolatæ, acuminatæ (semilineam longæ), haud angulatæ, aut læves nitidulæ, aut minutim papilloso-scabræ et opacæ, sulco angustissimo inferne parum latiori tota longitudine gynobasi filiformi seu tenuiter columnari adfixæ: stylus sæpius incrassatus: sepala lato-lanceolata, fructifera lineam longa, haud setosa, costa obscura: spicæ breves, condensatæ, congestæ, bracteis foliosis flores superantibus.

K. MICRANTHA. *Eritrichium micranthum*, Torr. Bot. Mex. Bound. 141. Pube brevi griseo-hirsuta, limbo corollæ vix lineam lato.

Var. LEPIDA. *Eritrichium micranthum*, var. *lepidum*, Gray, Syn. Fl. ii. 193. Magis hispidula, limbo corollæ ad lin. $2\frac{1}{2}$ diametro. — The two forms are confluent. The nutlets of both at full maturity are more commonly covered with minute papillæ, but sometimes they retain their smoothness.

* * PIPTOCALYX, i. e. calyx (5-fidus, villosa-hispida) supra basim fructum fulcrantem demum circumscissus et secedens: antheræ mucronulatæ: fructus *Eutypicarum*, nuculis ovato-acuminatis lævibus vel puncticulatis angulis lateralibus acutis sulco ventrali tenui basi divaricato-furcato tota fere longitudine gynobasi subulatæ adfixis: herba depresso-ramosissima, condensata; foliis brevibus linearibus; spicis etiam fructiferis brevibus glomeratis crebre folioso-bracteatis; corollis parvis. — *Piptocalyx*, Torr.

K. CIRCUMSCISSA. *Lithospermum circumscissum*, Hook. & Arn. Bot. Beech. 370. *Piptocalyx circumscissus*, Torr. in Wilkes Exped. xvii. 414, t. 12, B. *Eritrichium circumscissum*, Gray, Proc. Am. Acad. x. 58, Bot. Calif. i. 572, Syn. Fl. ii. 193. — Extends through the arid districts from Wyoming to Washington Territory, and south to Arizona.

§ 4. PTERYGIUM. Nuculæ *Eukrynitzkiæ* vel *Pseudokrynitzkiæ*, sed ala scariosa cinctæ, sive una exalata, gynobasi subulatæ usque ad apicem adfixæ, dorso granulato-scabræ vel muriculatæ: herbæ annuæ vel biennes, erectæ; corollæ tubo calyce haud longiore; spicis ebracteatis.

• Ala nucularum crenulata vel dentata nunc laciniata, lata, circumscriptione ovato-rotunda; vel nucula una quandoque exalata marginibus aut rotundatis aut acutiusculis: sepala ovato-lanceolata obtusiuscula.

K. PTEROCARYA. *Eritrichium pterocaryum*, Torr. in Wilkes Exped. xvii. 415, t. 13, B; Watson, Bot. King Exped. 245; Gray, Syn. Fl. ii. 195, cum var. PECTINATUM, forma ala nucularum pectinato-laciniata.

* * Ala integerrima, nucula haud latior, circumscriptione ovata: herbæ proceriores, rudes, aspero-hispidæ.

K. HOLOPTERA. *Eritrichium holopteron*, Gray, Proc. Am. Acad. xii. 81, & Syn. Fl. ii. 196. Pedalis et ultrapedalis, paniculato-ramosa, parviflora; foliis parum sesquipollicaribus linearibus. — Collected only by Dr. Palmer, in 1876, near Ehrenberg in Arizona, without mature fruit. A plant coll. by Dr. Palmer in 1877, at St. George, S. Utah, is in appearance between this and *K. oxygona*, with calyx silky-villous and apparently not bristly, the quite immature nutlets ovate-acute and narrowly winged.

K. SETOSISSIMA. *Eritrichium setosissimum*, Gray, l. c. Procera, bipedalis e radice bienni vel forte perenni, setis longis gracilibus hispidissima, sed foliis radicalibus (lanceolato-spathulatis cum petiolo nunc semipedalibus) pube molli canescentibus, setis fere nullis. Folia caulina lanceolata ad linearia, poll. 2-4 longa. Inflorescentia primum thyrsoido-spicata, demum in spicis plurimis rigidis poll. 3-4 longis strictis racemoso-dispositis evoluta. Corolla limbo lin. 3 lato. Calyx fructifer lin. 4 longus, sepalis lanceolato-oblongis. Nuculæ homomorphæ, cum ala (utrinque ultra semilineam lata) ovales, lenticulares, sulco aperto insertæ. — Collected in Southern Utah and Northern Arizona, by Ward, Palmer, and Rusby. A remarkable and very coarse species, with much the habit of *K. glomerata*.

§ 5. PSEUDOKRYNITZKIA. Nuculæ triquetra vel trigonæ angulis lateralibus acutatis, gynobasi plerumque subulatæ adfixæ: herbæ biennes vel perennes, pauca annuæ; corolla fornicibus faucialibus prominulis vel exsertis et annulo 10-squamellato vel glanduloso supra basim tubi sæpius instructæ. — *Eritrichium*, § *Krynitzkia*, subsect. *Pseudo-Myosotis*, Gray, l. c., excl. spec. nuculis alatis.

* *Intermediæ*, ramosæ, parvifloræ, foliis parvis linearibus, *Eukrynitziis* nimis affines.

+ Annua, cymis pedunculatis sæpius bi-tri-radiatis, spicis confertifloris brevibus ebracteatis.

K. OXYGONA. *Eritrichium oxigonum*, Gray, Proc. Am. Acad. xix. 89. Facie et calyce *K. pterocaryæ* sat similis, nuculis nisi acutangulis *Typicarum*. Nuculæ paullo ultra lineam longæ, dorso parce minute-que muriculatæ, nunc fere læves nitidulæ, circumscriptione angustodeltoideæ, sensim acutæ, angulis lateralibus acutatis, ventrali obtuso, sulco angusto basi furcato clauso tota longitudine gynobasi gracili adfixæ. Corolla limbo lin. 2 lato. — Collected by *Mr. Pringle* on the borders of the Mohave Desert in 1882, and again by *Mrs. Layne-Curran* in 1884.

+ + Basi demum lignescente perennans, paniculato-ramosissima, floribus parvis sparsis sæpe foliis fulcratis.

K. RAMOSISSIMA. *Eritrichium racemosum*, Watson in herb. Gray, Proc. Am. Acad. xvii. 226. Folia parva, cum calycibus angustis setis rigidis asperata. Nucula plerumque solitaria, tenuis, oblongo-lanceolata, scabrella, nitida. — This proves to be a rather widely spread species on the southern borders of California. It was described from a specimen collected by the Brothers *Parish* in San Bernardino Co.; has now been found in the Mohave Desert by *Mrs. Layne-Curran*, and at Point Loma and the Cantilas range on the borders of Lower California by *Mr. Orcutt*; also on Santa Catalina Island by *W. S. Lyon*. Moreover, it may now be identified with incomplete specimens collected on Cedros Island by the late *Dr. Veatch*, and on Guadalupe Island by *Dr. Palmer*; the latter wrongly referred to *Eritrichium angustifolium*. The specific name which it bore under *Eritrichium* I have replaced by a much fitter one. It was not very appropriate for the described specimen, and is still less so for those which have quite sessile or scattered flowers.

* * *Glomeratæ*, sat robustæ, e radice valida perenni vel bienni; foliis plerumque latiusculis; floribus thyrsoido-congestis mediocribus (corolla limbo lin. 3-4 lato) hinc inde bracteatis. (Flores in nonnullis heterogono-dimorphi: stylus crassiusculus.)

The final species of this division are too widely different from true *Krynitzia*. It might be more satisfactory to found a genus for all the following, along with *K. setosissima* (referred elsewhere on account of its decidedly winged nutlets); but the various intermediate forms forbid the taking of that course. Some tendency to heterogone dimor-

phism in the whole group is to be suspected, at least in the length of the style. For the last two species this is manifest, but sometimes low stamens are accompanied by a still lower style.*

+ Fructus (e nuculis 4 acutangulis dorso rotundatis arcte conniventibus) depresso-globosus : perennes, multicaules.

K. JAMESII. *Myosotis suffruticosa*, Torr. in Ann. Lyc. N. Y. ii. 225. *Eritrichium Jamesii* & *E. multicaule*, Torr. Bot. Mex. Bound. 140, & Marcy Rep. 294. Canescens pube adpressa molli, denique pl. m. hirsuta vel molliter hispida; caulibus brevibus decumbentibus nunc demum erectis subpedalibus; foliis obtusis oblanceolatis ad fere lineares; glomerulis demum in spicas evolutis; sepalis lanceolatis; corolla subrotata, tubo calycem haud superante lobis parum longiore, fornicibus exsertis oblongis; antheris oblongis fauci insertis; nuculis lævissimis, singulis $\frac{1}{4}$ globi depressi. — Sometimes decidedly hispid in age, sometimes canescent only with a soft and close pubescence. In the latter form it extends westward into San Bernardino Co., California, coll. *Parish*.

K. PALMERI. *Eritrichium fulvocanescens*, Watson, Proc. Am. Acad. xviii. 121, non Gray. Humilis; foliis angusto-linearibus pube strigoso-hirsuta canescentibus; caulibus calycibusque pilis patentibus hirsutissimis; corolla angusta, tubo sepala lineari-lanceolata vix superante lobis (parvulis) plus duplo longiore, fornicibus subglobosis; antheris fere linearibus; nuculis opacis rugosiusculis. — Coahuila, Mexico, forty miles south of Saltillo, *Dr. Palmer*, March, 1880, no. 895 of the distribution.

+ + Fructus pl. m. pyramidatus; nuculis dorso convexiusculis vel planis.

++ *Breviflora*, i. e. corolla tubo calycem haud superante limbo suo (diametro lin. 2-3 $\frac{1}{2}$ lato) breviora, fornicibus faucialibus semiglobosis paullo exsertis: antheræ oblongæ: sepala lanceolata: nuculæ ovatæ pl. m. obcompressæ, dorso saltem scabro vel tuberculato, angulis lateralibus marginato-acute acutissimis, ventre parum elevato sulco tenui basi in areolam desinente percurso.

= Setis longis patentissimis hispidissimæ, semipedales ad 2-3-pedales e radice bienni.

* *Myosotis grandiflora*, HBK., would seem from the figure to be of this group, if it came from Mexico ("in monte Orizaba, Sch. & Depe," ex DC. Prodr.), and not from the Quitensian Andes. May not the latter habitat come from a transposition of the two species of *Myosotis* in the Nov. Gen. & Spec. ?

K. VIRGATA. *Eritrichium virgatum*, Porter in Hayden Geol. Rep. 1870, 479. *E. glomeratum*, Gray, Am. Jour. Sci. ser. 2, xxxv. 225, non DC. *E. glomeratum*, var. *virgatum*, Porter & Coulter, Fl. Colorad. 102. Hispida, haud canescens; caule simplicissimo cum thyrso angustissimo stricto (sæpius ultrapedali) foliato demum 2-3-pedali; cymulia etiam fructiferis perbrevibus foliis fulcrantibus angusto-linearibus brevioribus; foliis caulinis inferioribus radicalibusque angustissime spathulatis; corollæ limbo lin. 2 lato, fornicibus lætioribus quam longis; nuculis vix ultra sequilineam longis lato-ovatis obtusis sæpe nitidulis dorso parce papillosis cæterum lævibus. — This we have only from the eastern slopes of the Rocky Mountains in Colorado, and it does appear to be a distinct species. The slender leaves subtending the cymes of the virgate thyrsus are an inch or two long, all but the uppermost several times longer than the flower-clusters.

K. GLOMERATA. *Cynoglossum glomeratum*, Pursh, Fl. ii. 729. *Myosotis glomerata*, Nutt. Gen. i. 112; Hook. Fl. Bor.-Am. ii. t. 162. *Rochelia glomerata*, Torr. Ann. Lyc. N. Y. ii. 225. *Eritrichium glomeratum*, DC. Prodr. x. 131; Porter & Coulter, Fl. Colorad. 102. *E. glomeratum*, var. *hispidissimum*, Torr. Bot. Mex. Bound. 140. Valde hispida; caule (cum thyrso oblongo interrupto demum aperto et in spicis fructiferis folia multo superantibus evoluto) semipedali ad sesquipedalem; foliis plerisque spathulatis, radicalibus saltem pube minuta inter setas basi demum papillosas pl. m. canescentibus; corolla limbo 2-3½ lin. lato, fornicibus æquilongis ac latis; nuculis crassioribus 1½-2 lin. longis ovatis versus apicem obtusiusculum angustatis, dorso pl. m. corrugato. — This belongs rather to the plains along the eastern base of the Rocky Mountains, from Saskatchewan to New Mexico, but extends westward to the interior of Washington Territory, and to northern parts of Arizona. It occurs both with short and with longer style.

= = Minus hispida, nana, multicaulis e caudice perenni; foliis saltem radicalibus pube molli strigoso-sericea incanis cum setis parum rigidis breviusculis plerumque incumbentibus: thyrsus etiam fructifer spiciformis: corolla lin. 2-3 lata.

K. SERICEA. *Eritrichium glomeratum*, var. *humile*, Gray, Proc. Am. Acad. x. 61, & Fl. l. c., magna parte. Nuculæ oblongo-ovatæ, obtusæ, obcompressæ, dorso subrugoso-tuberculatæ. — Alpine and sub-alpine, on mountains from Colorado and Utah to Oregon and Montana, and probably in the British Possessions. There are less canescent specimens from the Saskatchewan region and also from the higher Sierra Nevada (and uncertain as to the duration of the root) which

may belong either to this species or to dwarfed forms of the foregoing. I have adopted one of the two specific names under which this species occurs in Nuttall's collections.

++ ++ *Longifloræ*, i. e. corolla tubo (lin. 4-6 longo) calycem pl. m. superante limbo suo 2-4-plo longiore, fornicibus erectis elongatis (oblongis seu lanceolatis): antheræ sublineares: sepala mox elongato-lineararia: styli elongati: nuculæ intus pl. m. carinatæ, a basi ultra medium usque gynobasi subulatæ adfixæ: herbæ perennes, erectæ, multicaules; caulibus superne cum thyrso spiciformi interrupto tantum villosulo-hispidis; foliis præsertim radicalibus pube adpressa pl. m. incanis. Flores heterogono-dimorphi.

K. FULVOCANESCENS. *Eritrichium fulvocanescens*, Gray, Syn. Fl. ii. 197. *E. glomeratum*, pro parte, and var.? *fulvocanescens*, Watson, Bot. King Exped. 243. Spithamæa ad semipedalem, cæspitosa; foliis spathulatis nunc fere linearibus; corollæ tubo lin. 4 longo; nuculis ovatis acutiusculis opacis dorso pl. m. papillois vel tuberculato-rugosis. — Mountains of New Mexico and adjacent borders of Texas to those of Nevada, Wyoming, &c.

K. LEUCOPHÆA. *Myosotis leucophæa*, Dougl. in Lehm. Pugill. & Hook. Fl. Bor.-Am. ii. 82, t. 163. *Eritrichium (Pseudo-Myosotis) leucophæum*, A. DC. Prodr. x. 129. Pedalis et ultra; foliis lanceolato-spathulatis nunc fere linearibus; corollæ tubo lin. 5-6 longo intus parum annulato; nuculis triquetris circumscriptione ovatis lævissimis nitidis. — Dry interior region, from Brit. Columbia to S. Utah and S. E. California. Probably the corollas are never yellow. The only indication of it is on a ticket of specimens gathered by Prof. Brewer near Lake Mono, about which there may be a mistake. The older corollas of it appear to have turned brownish, as they are said to do in the preceding species.*

* KRYNITZKIA PHACELIOIDES, Fisch. & Meyer, is cited by Philippi, Cat. Pl. Chil. 211, as a synonym of *Eritrichium phacelioides*, Clos in Gay, Fl. Chil. iv. 468, t. 52 bis. By the figure the plant seems to have an annual root and marginless nutlets; so that it is probably a *Eukrynitzkia*, but with the habit of

K. ALYSSEOIDES, *E. alyssoides*, DC. Prodr. x. 131, which would seem to include *E. gnaphalioides*, A. DC. l. c., a suffrutescent perennial, perhaps also *E. Gilliesii*, Phil., at least Reed's plant so named, and to be referred to *Pseudokrynitzkia*.

K. CLANDESTINA (*Eritrichium*, A. DC.) has already been referred to (p. 274), and it may have some earlier and better specific name. This may also be the case with *E. cryptanthum*, A. DC.

K. LINEARIS, *Myosotis linearis*, Colla, Act. Taur. xxxviii. 126, t. 42 (*Eritrichium*, DC.), an annual, has acute-edged nutlets which may refer it to the neighborhood of *K. oxygona*.

These are Chilian species, and there are many more in the books.