

is clearly *H. procumbens*, and I suspect that *H. rigidulum* will eventually drop into the synonymy of that species.

HELIOTROPIUM RIVINOIDES Hassler, Add. Pl. Hass. i. 17 (1917).—This nomen nudum is associated with *Fiebrig 1439* from Paraguay. I have not seen this collection.

HELIOTROPIUM ROTUNDIFOLIUM Sieb. ex Lehm. Icones 19, t. 30 (1821).—This is a species of the Levant. At the New York Botanical Garden, however, there is a plant evidently representing it which is associated with one of Linden's original labels indicating that the plant was collected in New Grenada in 1842-3. It bears Linden's number 1594. I suspect that there has been some confusion in labeling the collection.

Heliotropium scandens Vell. Fl. Flum. 69 (1825) and Icones ii. t. 41 (1827).—*TOURNEFORTIA* sp.

Heliotropium scorpioides Willd. ex Lehm. Nov. Act. Acad. Caes. Leop. Nat. Cur. ix. 140 (1818), nomen; R. & S. Syst. iv. 737 (1819); not HBK (1818).—*LITHOSPERMUM DISTICHUM* Ortega.

Heliotropium stylosum Ph. Bot. Zeit. xxviii. 500 (1870).—*NEOCARYUM STYLOSUM* (Ph.) Johnston.

HELIOTROPIUM THYMIFOLIUM Vahl. ex Lehm. Neue Schr. Naturf. Ges. Halle iii. pt. 2, 17 (1817); Asperif. i. 67 (1818); DC. Prodr. ix. 543 (1845).—The source of the type is unknown, but is probably West Indian.

Heliotropium tarmense Krause, Bot. Jahrb. xxxvii. 632 (1906).—*TOURNEFORTIA* sp.

SCHLEIDENIA DASYCARPA Fresen. in Mart. Fl. Bras. viii. pt. 1, 37 (1857). *Heliotropium Martii* Gürke in E. & P. Nat. Pflanzenf. iv. Abt. 3a, 97 (1893). *Heliotropium dasycarpum* Fresen. ex Gürke, l. c.—Rio San Francisco near Joazeiro, Bahia, *Martius*; state of Piauhy, *Gardner 2262*; state of Bahia, *Blanchet 3903*.—I have only seen *Gardner 2262*. This is a phase of *H. paradoxum*. I suspect that at least some of the other collections represent *H. polyphyllum* Lehm.

2. NOTES ON VARIOUS BORAGINOIDEAE.

Cryptantha Werdermanniana, sp. nov., annua 5-15 cm. alta hirsuta ascender ramosa robusta; foliis lineari-clavatis obtusis hirsutis minute pustulatis 1-3 cm. longis 2-4 mm. latis ascendentibus superioribus paullo reductis; spicis solitariis 2-8 cm. longis ebracteatis; calycibus fructiferis laxè dispositis ascendentibus 7-8 mm. longis basem versus ca. 3 mm. crassis paullo asymmetricis tarde deciduis, basi rotundis cum pedicellis 1-2 mm. longis, lobis linearibus vel lanceolato-linearibus conniventibus sed apicem versus recurvatis

costa cum setis fulvescentibus horridis et in marginibus hispido-villosis; corolla inconspicua ad 4 mm. longa alba, lobis elliptico-obovatis ascendentibus ad 1 mm. longis; ovulis 4; nuculis 4 homomorphis 2.7–3 mm. longis 1.2–1.5 mm. latis lanceolato-oblongis maturitate brunneis densissime tuberculatis basi truncatis vel obtusis apice hebetibus margine angulatis dorso obtusis et infra medium obscure carinatis ventre ca. $\frac{4}{5}$ longitudinis ad gynobasem quadrangularem columnarem ca. 2 mm. longam affixis, sulcis paullo asymmetricis apicem versus clausis basem versus divaricato-furcatis in areolam triangularem parvam abrupte ampliatis; stylo ca. 1 mm. longo quam nuculae conspicue longiori.—CHILE: Cerro de la Copa, Dept. Taltal, 2300 m., Nov. 1925, *Ilse Francke* in *Pl. Chile. Werdermann. no. 1043* (TYPE, Gray Herb.).—A remarkably distinct new species which keys out in my revision, *Contr. Gray Herb.* lxxviii. 33 (1927), with *C. globulifera* (Clos) Reiche and *C. peruviana* Johnston. It is probably most nearly related to *C. globulifera* from which it differs in the size, form and roughenings of the nutlets, long style, much larger calyx, generally more robust habit and very detached northern range. The back of the nutlet is tuberculate with the tubercles very crowded. There is no evident transverse arrangement of the roughenings as in *C. globulifera* or *C. diffusa*. The new species comes from the salitrepampa about 85 km. northeastward from the port of Taltal, in about lat. $25^{\circ} 4' S.$ and long. $69^{\circ} 50' W.$

CRYPTANTHA PONDII Greene. Erectly branched rather slender strigose herb 1–3 dm. tall; stems tan-colored, antrorsely strigose; leaves not numerous, linear, obtusish, 1–2(–5 acc. Greene) cm. long, 1–2.5 mm. broad, more or less pustulate and strigose; spikes geminate or ternate (or quadrate acc. Greene), 1–2 cm. long, rather crowded and frequently glomerate, irregularly inconspicuously and shortly leafy-bracted throughout; corolla evident, limb spreading, 2–3 mm. broad; fruiting calyx obovate-oblong in outline, ca. 3 mm. long, somewhat asymmetrical, sessile by an oblique pyramidal base, ascending, tardily deciduous, appressed silky-hirsute; mature calyx-lobes linear-lanceolate, connivent, midrib thickened, unarmed; ovules 4; nutlets 4 or not infrequently fewer, subhomomorphous with the axial (?) one obscurely surpassing the others, smooth or very obscurely and minutely tuberculate above the middle, dark at maturity, 1.2–1.7 mm. long, 0.5–0.7 mm. broad, ovate-lanceolate, back flattened, margins definitely angled; groove nearly closed, medial, abruptly but narrowly forked at base; gynobase subulate, $\frac{2}{3}$ – $\frac{3}{4}$ height of nutlets; style decidedly surpassing the nutlets.—*Pittonia* i. 291 (1889). *C. Bartolomaei* Greene, l. c. ii. 232 (1892); Johnston, *Contr. Gray*

Herb. lxxiv. 103 (1925).—LOWER CALIFORNIA: Bay of San Bartolomé, 1889, *Lieut. Pond 22* (Greene Herb., TYPE of *C. Pondii*; US, ISOTYPE); Bay of San Bartolomé, 1889, *Lieut. Pond* (Greene Herb., TYPE of *C. Bartolomaei*).—During the summer of 1925 I was able to visit the Greene Herbarium now at the University of Notre Dame and took the opportunity to examine the types of *C. Pondii* and *C. Bartolomaei*. These plants are obviously the same species. They were collected at the same locality, on the same date and by the same collector and probably represent different portions of one collection. In 1925, l. c. 62, I incorrectly cited *C. Pondii* as a synonym of *C. patula* Greene, since the plants in the Gray Herbarium, received from Greene and labeled by him as part of the type-collection of *C. Pondii*, are clearly representative of his other species, *C. patula*, and, as seems probable now, part of the type-collection from San Benito Island. The plant in the National Herbarium at Washington, labeled as *C. Pondii*, has not been subjected to mislabeling and clearly represents *C. Pondii* Greene. The species is a very distinct one of uncertain affinities. It is probably best placed in a special Series between *Graciles* and *Ramulosissimae*.

CRYPTANTHA MOHAVENSIS Greene, *Pittonia* i. 120 (1887). *C. fallax* Greene, l. c. v. 54 (1902); Johnston, *Contr. Gray Herb.* lxxiv. 104 (1925).—The type of *C. fallax* has been examined. The species is obviously a synonym of *C. mohavensis*.

CRYPTANTHA CIRCUMSCISSA (H. & A.) Johnston, *Contr. Gray Herb.* lxxviii. 55 (1923). *Piptocalyx circumscissus* Torr. in *Wats. Bot. King Exped.* 240 (1871).—ARGENTINA: annual with white flowers, in sand near Me chat cheel, Neuquen, Nov. 11, 1925, *H. F. Comber 135* (G, K).—This very distinctive and unmistakable species can now be reported from Argentina since the material obtained by Mr. Comber matches in habit as well as structural details the common plant of western United States. The list of indigenous borages which occur in Argentina and Chile and reappear in United States now consists of *Pectocarya linearis* (R. & P.) DC., *Pectocarya pusilla* (A. DC.) Gray, *Cryptantha albida* (HBK.) Johnston, *C. circumscissa* (H. & A.) Johnston, *Plagiobothrys fulvus* (H. & A.) Johnston, *Lappula Redowskii* (Hornem.) Greene, *Lappula texana* (Scheele) Britt., *Myosotis virginica* (L.) BSP. and *Coldenia Nuttallii* Hook.

Plagiobothrys (§ ? *Allocarya*) **plurisepalus** (F. v. Muell.), comb. nov. Annual; stems prostrate or ascending, 3–15(–20) cm. long, simple or with a few long simple ascending branches, strigose or somewhat hispid-villous, floriferous to the base; leaves sublinear, very gradually tapered towards the base, 1–3 cm. long, 1–2.5 mm. broad,

obtuse, strigose or appressed hispid-villous; occasionally somewhat pustulate, lowest ones crowded into an evanescent rosette; flowers numerous, loosely racemose; bracts linear, foliaceous, remote, extra-axillary or even oppositiflorous; calyx ca. 2 mm. long in flower, more or less villous, divided into 5-8(-9 fide Muell.) linear lobes; fruiting calyces strongly accrescent and asymmetrical, 5-9 mm. long, their lobes conspicuously indurated and thickened at the base and closely investing the fruit, upper parts curved or much contorted; mature pedicels ascending, 1-2 mm. long, coarse; corolla inconspicuous, white but drying brownish, ca. 2 mm. long, subtubular; corolla-lobes 4-6, ovate-orbicular, ascending, small; corolla-throat with weakly intruded puberulent areas alternating with the lobes; stamens 2-5, inserted just below the middle of the tube; ovules 2 or less commonly 4; nutlets 2 or less commonly 4, oblong-ovate, heteromorphic, frequently asymmetrical, pale or somewhat fuscous, the back and sides rounded and roughened with a system of more or less transverse loosely reticulate (frequently high narrow) ridges which anastomose with the medial dorsal keel and below the middle frequently develop at the expense of it, apex frequently cornute, ventral surface keeled prominently to just below the middle; areola cuneate in outline, submedial, sunken below the crest of the keel; axial nutlet usually slightly smaller and broader, dulled with very minute papillae or spicules, most persistent; style reaching to about $\frac{1}{2}$ - $\frac{2}{3}$ height of nutlets.—*Maccoya plurisepalea* F. v. Muell. Frag. Aust. i. 127 (1859). *Rochelia plurisepalea* Druce, Rep. Bot. Exch. Cl. Brit. Isles iv. 644 (1917). *R. Maccoya* F. v. Muell ex Benth. Fl. Aust. iv. 408 (1869).—NEW SOUTH WALES: Bulloo River, 1887, L. Morton; Taretta, Aug. 1887, W. Bauerlen 102; Broken Hill, Oct. 1917, A. B. Black; Murray River, Mueller. SOUTH AUSTRALIA: Arkaringa Creek, May 1891, R. Helms; Mt. Lyndhurst, Sept. 1898, M. Koch 266; Quorn, Oct. 1916, J. M. Black; Hawker, Oct. 1916, J. M. Black; Lake Weatherstone, Flinders Range near Lake Torrens, Nov. 1882, R. Tate; Murray Plains, Aug. 1881, R. Tate; Carrieton, Sept. 1916, J. M. Black.—Because of a superficial resemblance in the calyx and a coincidental development of biovulate flowers this remarkable species since its initial publication has been confused with *Rochelia*. *Rochelia*, however, is only a distant relative being most closely related to *Lappula*, having the nutlet-attachment of that genus and in addition nutlets that are roughened by tuberculations which are crowned by stellate trichomes. The immediate relatives of our plant are found in *Plagiobothrys*, particularly in the section *Allocarya*. In habit, the general characters of the flower and especially in the attachment, form, and markings of the

nutlets our plant agrees perfectly with the section *Allocarya*. In fact as a member of *Plagiobothrys* the species is striking only because of the erratic variation in the number of its floral parts. This remarkable variation, while perhaps characteristic for the species, yields no generic characters, inasmuch as the range of variation exhibited includes that which is normal for *Plagiobothrys*. This may be appreciated by a study of the tabulation given below. The collections dissected are indicated by the letter on the left. The collections cited above have been lettered in the order that they are arranged, thus, for example, "G" refers to Mr. Black's collection from Quorn. The material studied is scanty, but opportunity was usually found for making at least three dissections of each collection.

Collection	Ovules	Anthers	Corolla-lobes	Calyx-lobes
A	2	4	4	5
B	2	2	4	5
C	2	3-5	5	5
D	2	4	4? or 5?	7
E	4	3	5	5
F	4	3	5	5
G	2	4-5	5	7
H	2	3-4	5-6	7-8
I	4	4	5	5
J	2	3	5	7
K	2	4-5	6	7
	2 or 4	2-5	4-6	5-8

The number of floral parts furnishing no differentiae it is evident that the plant must be distinguished by structural differences. The most important of these is the thickened and indurated calyx-lobes which much suggest those of *Cryptantha texana* (DC.) Greene and relatives and to a less extent *P. glaber* (Gray) Johnston and its relatives.

In *P. plurisepalus* the great bulk of the plant is inflorescence, consisting of elongate loosely flowered false racemes (helicoid uniparous cymes). The plant is floriferous almost to the very base, and the stem proper very much reduced. The cauline leaves are hence crowded into a loose rosette. I am unable to state definitely that the lowest leaves are opposite, though I have some indication that they are so. My material is not copious and in most cases is too mature for the settling of this point. As all the species of *Plagiobothrys* have opposite lower leaves, though the pairing of these is sometimes obscured by the shortening of the stem and the consequent crowding into a rosette, it is of particular interest that the presence or absence of them be ascertained in the present species. This is most readily accomplished by some one who has access to plentiful fresh material.

Some of the collections I have cited have been determined as *Eritrichium australasicum*, apparently because they matured 4 nutlets. As here defined the species is taken as characterized by its thickened calyx-lobes and elongate somewhat heteromorphous nutlets. With the calyx-lobes, corolla-lobes and stamens showing erratic departures from the normal number in the group, it is not at all surprising to find the ovules behaving in a similar though less extreme manner. Personally I am surprised that they do not vary more, and that plants with 3 ovules or merely a single one have not been found. In any event the number of nutlets is at best a poor character since even in forms normally producing 4 ovules one to several are frequently aborted and a reduced number of nutlets matured.

For the opportunity of examining a series of specimens representing this and the following species I am particularly indebted to Mr. J. M. Black of North Adelaide, South Australia, who not only shared his specimens with me, but also won the interest of Mr. J. W. Audas of Victoria, who also generously provided me with material. To both of these gentlemen I would here express my cordial thanks for their important assistance without which the notes on these Australian species could not have been prepared.

Plagiobothrys (§ *Allocarya*) **elachanthus** (F. v. Muell.), comb. nov. Annual; stems one to several, erect or prostrate, (including the inflorescence) 5-15 cm. long, simple or with a very few long simple strict branches, usually appressed-villous or hispid-villous; leaves linear, 1-2.5 cm. long, 1-2 mm. broad, obtuse, spreading, sparsely villous or hispid with usually appressed hairs, occasionally pustulate, lower ones opposite, the others alternate; racemes 2-10 cm. long, simple, loosely flowered, interruptedly bracted; calyx ca. 1 or rarely 2 mm. long in flower, divided into 5 erect lance-oblong or rarely linear villous lobes; fruiting calyx 2-3(-5) mm. long, lobes herbaceous, linear; pedicels thickened, ca. 0.5 mm. long, ascending; corolla inconspicuous, white but drying brownish, 1.8-2 mm. long, only shortly surpassing the calyx; limb narrow, 0.8-1 mm. broad, with 5 ascending obovate lobes; throat bearing 5 weakly intruded puberulent areas; stamens 5, borne below the middle of the tube; ovules 4; nutlets 4, lustrous and somewhat glassy, pale or rarely fuscous, angulate, the body ovoid but puckered just above the base ventrally and bearing there the small plane oblong or narrowly triangular slightly oblique attachment scar, almost completely encircled medio-longitudinally with a strong keel which is conspicuously developed above the middle, back and sides coarsely reticulate with prominent ridges which anas-

tomose with the keel particularly below the middle; gynobase pyramidal; style reaching to $\frac{3}{5}$ – $\frac{4}{5}$ height of nutlets.—*Heliotropium elachanthum* F. v. Muell. *Linnaea* xxv. 424 (1852).—VICTORIA: Wattville near Dookie, Oct. 1922, A. B. O'Dowd; Wimmera, 1890, Mueller; Wimmera, Dallachy; Lara, 1923, A. F. Gates; Dimboola, F. Reader. SOUTH AUSTRALIA: Pt. Lincoln, Oct. 1909, H. Griffith; Rocky Creek, Oct. 1851, Mueller.—A well marked species previously confused with *P. australasicus* from which it is readily separated by the characters of the nutlets. The body of the nutlet above the base is somewhat drawn out obliquely downward. On the crest of this puckering is found the areola. In this character the plant suggests relationships with the section *Echidiocarya*, as does also the non-compressed body of the nutlet, its reticulate ridging and somewhat vitreous pericarp. The fruit, however, is by no means so definitely stiped as in *Echidiocarya*.

Thanks to the courtesy and interest of Mr. J. F. Rae of the National Herbarium of Victoria, I have had the privilege of examining a portion of the type of *H. elechanthum*. Like the other collection from South Australia, i. e. Griffith's from Pt. Lincoln, Baron Mueller's type is coarser in habit and has slightly larger fruit than the plants I have seen from Victoria.

PLAGIOBOTHRYIS (§ *Allocarya*) AUSTRALASICUS (A. DC.) Johnston. Annual; stems one to several, erect or prostrate, (including the inflorescence) 5–12 cm. long, usually with several strictly ascending simple laterals from below the middle, sparsely strigose; leaves linear, 1–3 cm. long, 1–2(–2.8) mm. broad, obtuse, spreading, glabrous or sparsely appressed short-hispid, lower ones opposite, margins ciliate and frequently pustulate; racemes 3–8 cm. long, remotely flowered, interruptedly bracted, simple; calyx in flower ca. 1.5 mm. long, appressed villous-hispid, divided into 5 erect lance-oblong lobes; fruiting calyx 2–2.5 mm. long, the lobes lanceolate, herbaceous and ascending; pedicels thickened, ca. 0.5 mm. long, ascending; corolla inconspicuous, white but drying brownish, ca. 1.8 mm. long, shortly surpassing the calyx; limb 0.7–1 mm. broad, with 5 ascending obovate lobes; stamens borne just below middle of tube; corolla-throat with 5 weakly intruded puberulent spots; ovules 4; nutlets 4, pale or fuscous, opaque, ca. 1.3 mm. long, compressed-ovoid, angulate, roughened on the back and sides with loosely reticulate ridges that anastomose with the well developed medio-dorsal keel, ventral face with a large areola sunken below the crest of the keel, ventral keel extending down to about middle of the nutlet and paralleled and crowded on either side by wrinkles in the pericarp; areola inframedial, triangular, more

or less excavated, about $\frac{2}{5}$ length of nutlet, not oblique; gynobase pyramidal; style reaching to about $\frac{4}{5}$ height of nutlets.—Contr. Gray Herb. lxxviii. 75 (1923). *Eritrichium australasicum* A. DC. Prodr. x. 134 (1846). *Allocarya australasica* Greene, Erythea iii. 57 (1895).—WESTERN AUSTRALIA: Swan River, 1839, Drummond.—This species is apparently restricted to Western Australia, the forms from eastern Australia passing as this species being in large part at least *P. elachanthus*. It is evidently quite distinct from that species differing in its opaque, more compressed nutlets and very different nutlet-attachment. The areola is decidedly triangular and somewhat excavated and is located on the lower half of the nutlet evidently sunken below the level of the ventral keel. It appears to be rather closely related to *P. procumbens* (Colla) Gray of Chile.

Plagiobothrys orientalis (L.), comb. nov. *Heliotropium orientale* L. Sp. Pl. 131 (1753); Houttuyn, Linn. Pflanzensyst. v. 402 (1779); Lehm. Asperif. i. 73 (1818). *Lithospermum javanicum* Steud. Syst. i. 547 (1825). *Eritrichium plebejum*, var. *tenue* Herder, Act. Hort. Petrop. i. 542 (1872), excl. pl. amer. *Allocarya asiatica* Kom. in Fedde, Repert. xiii. 236 (1914). *P. asiaticus* Johnston, Contr. Gray Herb. lxxiii. 68 (1924).—The type of *Heliotropium orientale* L., since its publication unidentified, is clearly the Kamtchatkan species of *Plagiobothrys*. I compared a collection of Rieder, isotypic of *E. plebejum*, var. *tenue*, and a Kamtchatkan collection made by Kamarov (on Aug. 19, 1908) directly with the type at the Linnean Society and found them remarkably similar and evidently conspecific. The collections of Kamarov and Rieder were from the herbarium at Kew. The type of *Heliotropium orientale* in the Linnean Herbarium lacks detailed data. However the cabalistic symbol associated with the plant was examined by the late B. Daydon Jackson, who informed me that the plant was presumably collected by Steller in Kamtchatka. This would agree with what we know of the distribution of the species represented. More authentic material of the species appears to be preserved at Stockholm. Lindman, Ark. Bot. ix. no. 6, pg. 3 (1909), gives the source of this material as "leg. König in Asia." The accuracy of this I doubt. According to Jackson, Index Linn. Herb. 14 (1912), Linnaeus had collections by König only from Iceland and southern India, in neither of which regions *Plagiobothrys* is known to grow or to be even expected. Hultén, K. Sv. Vet. Akad. Handl. ser. 3, v. no. 1, 5-12 (1927), who gives a very detailed account of botanical exploration in Kamtchatka, does not list König as a collector in Kamtchatka, the only region in which the species represented by the Linnean type is known to grow.

Various authors after Linneus considered the plant to have come from Java. Steudel even went so far as to rename it *Lithospermum javanicum*. I can find no mention of the plant in any of the literature on the flora of Java. The basis for attributing the plant to Java appears to be the statement, "Diese ist . . . in Ostindien, vornämlich in Java zu Hause," which is found in the German edition of the Systema commonly attributed to Houttuyn (for complete citation see Willd. Sp. Pl. i. pg. xxv).

Plagiobothrys gracilis (R. & P.), comb. nov. *Myosotis gracilis* R. & P. Fl. Peruv. ii. 5 (1799). *Echinosperrum gracile* Lehm. Asperif. i. 129 (1818). *Rochelia gracilis* R. & S. Syst. iv. 111 (1819). *Pectocarya gracilis* Johnston, Contr. Gray Herb. lxx. 36 (1924).—The type of *Myosotis gracilis* is not a *Pectocarya*, which all authors for almost a century have assumed, but is instead definitely a species of *Plagiobothrys* of the section *Allocarya*. The original collection is said to have come from Concepcion, Chile. The specimen from Ruiz preserved at Berlin shows the plant to have fruit similar to *P. Greenei* of California. The only Chilean material, seen by me, which has similar fruit and habit is a collection made by Baeza in 1917 at Cerrillos in the province of Coquimbo. This plant I recently referred to *P. procumbens*, Contr. Gray Herb. lxxviii. 89–90 (1927). Provisionally, however, I am recognizing both *P. gracilis* and *P. procumbens*, distinguishing the former from *P. procumbens* by the presence of four consimilar nutlets all armed with evident glochidiate subulate appendages. In *P. procumbens* the nutlets are all unarmed or only the axial nutlet is armed with short glochidiate appendages. Just how *P. gracilis* is to be distinguished from *P. Greenei*, if indeed it can be distinguished, has not been determined.

Pectocarya platycarpa Munz & Johnston, comb. nov. *P. gracilis*, var. *platycarpa* Munz & Johnston, Contr. Gray Herb. lxx. 36 (1924).—It having been found that the name *Pectocarya gracilis* (R. & P.) Johnston belongs in the synonymy of a species of *Plagiobothrys*, the occasion is taken for giving specific recognition to the present plant. This plant of the deserts of California, Arizona and Utah is clearly distinct from *Pectocarya linearis* (R. & P.) DC. in its very broad thick nutlet-margins, stiffer habit and different range.

Trigonotis minutus (Wernh.), comb. nov. *Lithospermum minutum* Wernh. Trans. Linn. Soc. ser. 2, Bot. ix. 118 (1916). *Plagiobothrys minutus* Johnston, Contr. Gray Herb. lxxiii. 68 (1924).—I have examined the type of this species at the British Museum. The material is scant but seems clearly to represent a species of *Trigonotis*. It is most certainly not a *Plagiobothrys*.

HAVILANDIA BORNEENSIS Stapf, Trans. Linn. Soc. ser. 2, Bot. iv. 209, t. 16a (1894). *Lithospermum borneensis* Boerl. Handl. Fl. Nederl. Ind. ii. pt. 2, 488 (1899). *Plagiobothrys borneensis* Johnston, Contr. Gray Herb. lxxiii. 68 (1924).

HAVILANDIA PAPUANA Hemsl. Kew Bull. 1899: 107 (1899).—The genus *Havilandia* was incorrectly referred to *Plagiobothrys*, its relations, rather, appear to be with *Trigonotis*, a genus which has a number of species in the temperate areas of the larger islands of the East Indies. The gross habit, texture of the herbage, pubescence and corolla structures are characteristic of that genus. It differs, however, in having nutlets with a definitely basal or very slightly supra-basal attachment. The individual nutlets suggest those of *Zoelleria*.

ZOELLERIA PROCUMBENS Warb. Bot. Jahrb. xvi. 28 (1893).—I have been able to study the type of this monotypic genus at Berlin. I entirely agree with Warburg, who stated that *Zoelleria* was aberrant only as to the number of nutlets. The genus is related to *Trigonotis* and *Havilandia*, which it closely resembles in habit and vegetative as well as floral characters. The nutlets are smooth and obscurely tetrahedral. I do not believe that it merits the recognition as a distinct tribe of the *Boraginoideae* accorded it by Gürke, E. & P. Nat. Pflanzenf. iv. Abt. 3a, 131 (1893). It is simply an aberrant relative of *Havilandia* and *Trigonotis* and like them evidently belonging to the tribe *Eritrichieae*.

Microula Rockii, sp. nov., perennis; caulibus erectis vel decumbentibus 5–20 cm. longis gracilibus herbaceis sparse adpresseque villosis basem versus longe ramosis e radice erecta profunda gracile orientibus; foliis herbaceis obtusis costatis sed enervatis subtus glabris supra sparse adpresseque villosis, inferioribus oblanceolatis vel oblongo-oblanceolatis 2–3 cm. longis 0.7–1 cm. latis basem versus gradatim attenuatis, caulinis 5–18 mm. longis ellipticis vel obovato-ellipticis distantibus ascendentibus; floribus in glomerulos 5–8-floros collectis ad apices ramulorum gracilium paucifoliorum dispositis et a foliis suffultis; calycibus 5-lobatis nigrescentibus herbaceis villosociliatis extus glabris, lobis lanceolatis ascendentibus acutis ecostatis ca. 1 mm. longis, maturitate paulo accrescentibus ovato-lanceolatis ad 2 mm. longis; pedicellis brevibus 1–6 mm. longis gracilibus erectis vel ascendentibus; corolla dilutissime caerulea conspicua 6–10 mm. diametro, lobis obovato-orbicularibus rotundatis patentibus, tubo subcylindrico apicem versus paulo gradatim ampliato 2–2.5 mm. longo 1.5–2.2 mm. crasso fusco calycem paulo superanti, fornicibus 5 trapeziformibus ca. 0.5 mm. altis latere exteriori dense breviterque villosis latere interiori glaberrimis; staminibus inclusis medio tubo

affixis; antheris oblongis ca. 0.7 mm. longis quam filamentis subulatis 2-3-plo longioribus; ovario glaberrimo 4-ovulato; stigmatibus capitato; nuculis 1-4 horizontalibus vel ascendentibus pallidis plus minusve spiculiferis 2.5-3.5 mm. longis basem versus sparse rugosis vel cristatis dorso medio-longitudinali cum areola 2-3 mm. longa angusta prominenti ornatis (marginis areolae obtuse dentatis) ventre per areolam medialem vel paullo submedialem parvam ad gynobasem convexam adfixis.—TIBET: moist meadows of Wanchen nira, between Labrang and Yellow River, alt. 3300 m., July 29, 1926, *J. F. Rock 14511* (TYPE, Gray Herb.); wet meadows of Dzomo la, in alpine region between Radja and Jupar range, alt. 3300 m., July 1926, *Rock 14384* (G). KANSU: alpine meadows in mountains west of Adjüan, east end of Minshan, T'ao River Basin, alt. 3750 m. and lower, July 5, 1925, *Rock 12605* (G).—An extremely well marked species characterized by its large very pale-blue corollas, very fine appressed and inconspicuous pubescence, glabrate lower leaf-faces and very elongate dorsal areola of the nutlets. In lateral view the nutlets much suggest those of a true *Eritrichium*, but the surface of the nutlets and the nature of the dorsal areola point unmistakably to *Microula*. The species is known only from eastern Tibet and southwestern Kansu.

Microula trichocarpa (Maxim.), comb. nov. *Omphalodes trichocarpa* Maxim. Bull. Acad. St. Petersb. xxvi. 500 (1880) and Mém. Biol. x. 681 (1880); Brand, Pflanzenr. iv. Fam. 252, 105 (1921).—I have had the opportunity to study isotypic material of this species at Kew. It is obviously a *Microula* and appears to be most related to *M. myosotidea*. A collection from Gargannar in southwestern Kansu collected by R. C. Ching, no. 919, is referable to the species.

Microula Forrestii (Diels), comb. nov. *Omphalodes Forrestii* Diels, Notes Royal Bot. Gard. Edinburgh v. 169 (1912); Brand, Pflanzenr. iv. Fam. 252, 105 (1921). *M. hirsuta* Johnston, Contr. Gray Herb. lxxv. 48 (1925).—The type of *M. Forrestii* and *M. hirsuta* came from the same mountain-mass and are obviously synonymous.