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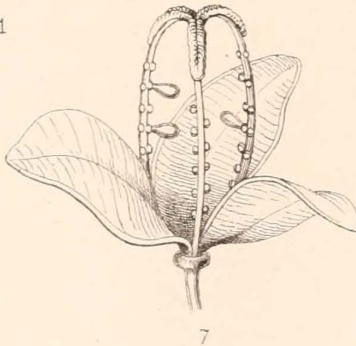
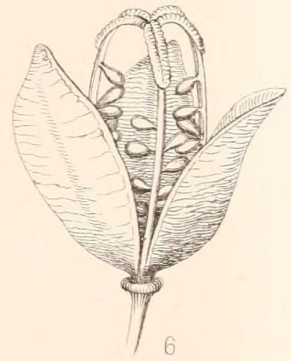
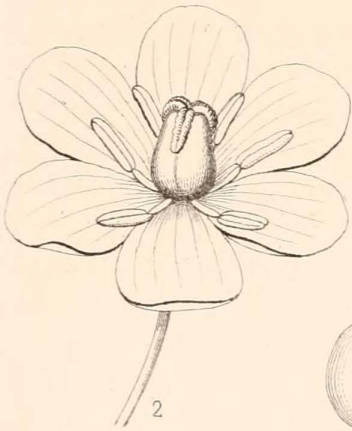
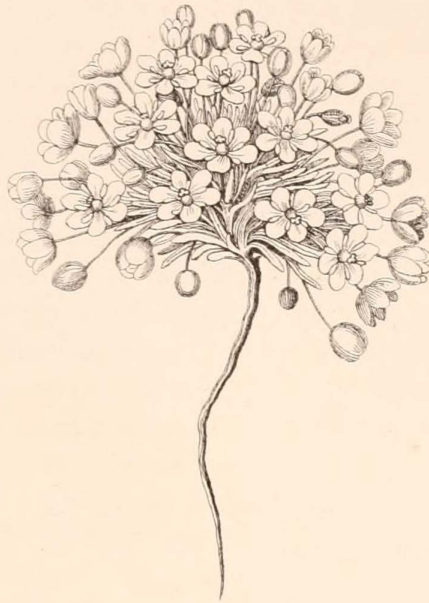
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1877.

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Sprague

Wm. S. Sear & Co. Lith. Phila.

Canbya Candida.



S. J. Gray

The Sinclair & Son. Lit. Phila.

Arctomecon Californicum.

V.

CONTRIBUTIONS TO THE BOTANY OF NORTH
AMERICA.

BY ASA GRAY.

Presented June 13, and October 11, 1876.

1. *Characters of Canbya (n. gen.) and Arctomecon.*

WITH TWO PLATES.

CANBYA, Parry, nov. gen. *Papaveracearum*.

Sepala 3, caduca. Petala 6, obovata, diu persistentia, demum scariosa, capsulam obvolvunt. Stamina 6-9: filamenta antheris oblongo-linearibus breviora. Ovarium subglobosum: placentæ 3, nerviformes, multiovulatæ: stylus nullus: stigmata 3, oblongo-linearia, reflexo-divaricata, ovario adpressa, *placentis superposita*, facie superiore (interiore) prorsus papillosa. Capsula ovoidea, membranacea, a vertice ad basim trivalvis, valvis placentas filiformes cum stigmatibus persistentes nudantibus. Semina plurima, elongato-oblonga, parum arcuata; testa lævissima nitida; rhaphe haud prominula nuda. Embryo prope basim albuminis minimus, cylindraceus. — Herbula annua, glabra, parum uncialis; foliis alternis linearibus integerrimis subcarnosis cum ramis brevissimis cæspitosis-confertissimis; scapis perplurimis filiformibus (semipollicaribus) unifloris; petalis læte albis.

CANBYA CANDIDA, Parry. South-eastern California, in sandy soil on the Upper Mohave River, Dr. E. Palmer, May 18, 1876 (in flower and fruit). — This charming little winter-annual is one of the discoveries made by the botanical party, consisting of Doctors Palmer and Parry and Mr. Lemmon, which passed last winter in S. E. California and adjacent districts. Dr. Parry, who immediately recognized its botanical interest, proposed to dedicate the plant to our common friend and worthy fellow botanist, William M. Canby, Esq., of Wilmington, Delaware; and I have peculiar pleasure in carrying this proposition into effect.

The plant is of most diminutive size, but of much botanical interest and no small beauty. From the *Sagina*-like tuft of foliage at the surface of the ground rises a multitude of tiny peduncles or scapes, each tipped with a bright white flower which lasts for many days; the petals (barely two lines long) opening at sunrise, and at sunset closing over the ovary, and at length permanently over the capsule, into a globular form, which the discoverer likens to a pearl. The most unexpected anomaly in this order of a persistent (instead of caducous) corolla is shared by *Arctomecon*, native of the same district, as Dr. Parry himself ascertained upon rediscovering that exceedingly rare plant in the spring of the preceding year. There are other Papaveraceous plants which hold their petals for a day or two, notably *Sanguinaria* in which they open and close for four or five days before falling; but in these two peculiar genera they become scarious, remaining permanently in *Arctomecon*, and up to the full maturity of the capsule in *Canbya*.

The two genera, although closely related, differ in some important points of floral structure as well as in aspect. The most marked difference is in the stigmas, which in *Canbya* are perfectly sessile, long, entire, and divergent to the utmost, so that their backs are closely applied to the surface of the rounded top of the ovary, directly over the placentæ, and the upper or ventral face papillose-stigmatic; while *Arctomecon* has a short style, the indistinct lobes of which bear extrorse and two-lobed stigmas, which are alternate with the placentæ, and are closely appressed or even partly united in a kind of head. The capsule of the one is membranaceous and dehiscent to the base; of the other, coriaceous and apparently dehiscent only to the middle. The seeds and the stamens are likewise different. The wretched figure of *Arctomecon* in Fremont's Report exhibits none of these characters, and it led Bentham and Hooker to conjecture that plant might be only a *Papaver*, allied to *P. nudicaule*. Dr. Parry's specimens were received in time for a partial reconstruction of the generic character in the Botany of California; but the position of the stigmas and the presence of a prominent crest of the seed have not before been noticed. A full character of that genus is therefore here given, along with that of *Canbya*.

ARCTOMECON, Torr.

Sepala 2, raro 3? Petala 4, latissime obovata, persistentia, demum tenuiter scariosa. Stamina indefinite plurima: filamenta sursum parum dilatata, antheris brevi-linearibus longiora. Ovarium obovoideum:

placentæ 3-6, nerviformes, pluriovulatæ : stylus brevissimus, sublobatus, lobis erectis pl. m. coadunatis stigmata *placentis alterna* cordato-biloba capitato-conferta extrorsum gerentibus. Capsula obovoidea, subangulata, apice breviter 3-6-valvis; valvis coriaceis a placentis filiformibus stylo brevissimo persistente connexis solutis. Semina pauciuscula, majuscula, oblonga, recta; rraphe cristata; testa tenuiter lineolata, crista ad hilum carunculato-dilatata sursum sensim angustiore. Embryo cylindræus, albumine $\frac{2}{3}$ brevior. — Herba nana, ut videtur biennis; foliis alternis (summisve nunc oppositis) cuneatis vel spathulato-lanceolatis apice 2-5-dentatis seu inciso lobatis barbato-setosis; pedunculis subumbellatis nunc scapiformibus unifloris; floribus majusculis albis.

ARCTOMECON CALIFORNICUM, Torr. in Frem. Rep. ed. 2, 312, t. 2; Parry in Am. Naturalist, ix. 139 & 268; Brewer & Watson, Bot. Calif. i. 21.

The accompanying plates illustrate the two genera:—

PLATE I. CANBYA CANDIDA. Plant of the natural size.

FIG. 1. Flower bud, enlarged.

2. Expanded flower, enlarged.

3. Stamen, more magnified, as are all the following details.

4. Base of ovary showing cross section, and upper part, with the stigmas.

5. Mature capsule with the investing persistent petals.

6. Dehiscent capsule, with seeds.

7. Same, the seeds fallen.

8. Seed, more magnified.

9. Embryo, on the same scale.

PLATE II. ARCTOMECON CALIFORNICUM. Natural size: the details variously magnified.

FIG. 1. A stamen.

2. Pistil transversely divided.

3. Dehiscent capsule.

4. Seed, lateral view.

5. Same, with crest anterior.

6. Embryo, equally magnified with the seed.

7. Portion of surface of seed, more magnified, to show the lineolation.

8. Portion of bristle from a leaf.

2. *Characters of New Species, &c.*

ISOPYRUM STIPITATUM. Perenne; radicibus fasciculatis; caulibus spithamæis versus apicem 1-2-foliatis 1-2-floris; foliis radicalibus tri-caulinis sæpius bi-ternatisectis, petiolulis primariis secundariisque elongatis, segmentis ultimis foliolisve sessilibus nunc confluentibus lineari-oblongis integris vel cuneatis trifidis; pedunculo sub flore parvo incrassato; sepalis 4-5 oblongis; petalis nullis; staminibus parum 10, filamentis subulato-complanatis: folliculis totidem oblongis utrinque obtusissimis vix venosis 3-4-spermis longiuscule stipitatis. — Northern California, near Yreka, Siskiyou Co., April, 1876, under *Ceanothus* and Oak bushes, Rev. E. L. Greene. A most distinct species; with flowers much smaller than those of *T. occidentale*, of which it has the habit, although larger than those of *T. fumarioides*. Stipe of the fruit nearly a line long.

NASTURTIUM TRACHYCARPUM. E radice annua? erectum, ramosum (pedale), fere glabrum; foliis lyrato-subpinnatifidis; racemis laxis; floribus albidis; petalis spathulatis sepala antherasque oblongo-sagittatas parum superantibus; siliquis oblongo-linearibus (lin. 4-5 longis) papilloso-asperatis in pedicello rigido mox recurvato curvato-adscendentibus stylo longo subulato superatis. — S. W. Colorado, on the San Juan, &c., T. S. Brandegee, in Hayden's Expedition, 1875. The rhachis of the raceme and the stout pedicels are more or less studded with the small rough papillæ which abound on the pod and suggest the name for the species, which is a very distinct one.

LEPIDIUM DICTYOTUM, Gray, var. ? **ACUTIDENS**, siliculis magis ovatis, dentibus longioribus deltoideo- immo subulato-triangularibus omnino acutis. — California at Yreka, E. L. Greene.

CLAYTONIA BULBIFERA. *C. Sibirica*, L. (*alsinodei*, Sims) similis, sed bulbillis radicalibus bulboso-confertis perennans; racemis elongandis folioso-bracteatis; bracteis spathulatis seu lineari-oblongis; sepalis latioribus, fructiferis dilatatis. — Scott Mountains, Siskiyou Co., California, E. L. Greene. Also received from some other Californian collectors, but without the bulbiferous base. To the acute observation of Mr. Greene we are also indebted for an indication of the characters which appear to demand the re-establishment of *C. parviflora*, Hook. and perhaps one or two other species.

ASTRAGALUS COLLINUS, Dougl., var. **CALIFORNICUS**, leguminibus cum stipite sesquipollicaribus purpureo-marmoratis. — Yreka, California, E. L. Greene.

ASTRAGALUS FLAVUS, Nutt., var. **CANDICANS**. Canescens; pedun-

culis subscapiformibus. — Near Richfield, Utah, at 5,900 feet, in loose ashy soil, Lester F. Ward, in Powell's Expedition. Apparently a form of Nuttall's species, but more condensed as well as hoary, and with somewhat the aspect of *Oxytropis*. The specimens supply mature fruit, which is wanting in Nuttall's specimens. The legume is one-celled, with little or no introflexion or thickening of the dorsal suture; while externally the ventral suture has a very salient ridge and a shallow and broad groove each side of it, somewhat in the manner of *A. bisulcatus*.

ASTRAGALUS WARDI. *Inflati*: perennis? viridis, undique fere glaber; caulibus erectis ultrapedalibus foliosis: stipulis triangularibus vel subulatis parvulis: foliolis multijugis angusto-oblongis obtusis retusisve (lin. 3-4 longis); pedunculis filiformibus folio brevioribus laxe racemoso-10-15-floris; floribus mox pendulis; calycis dentibus subulato-setaceis tubo breviter campanulato æquilongis; corolla alba nunc purpurascente lin. 2-3 longa; legumine vesiculoso ovato acuto recto subæquilatero haud stipitato glaberrimo purpureo-marmorato $\frac{3}{4}$ -pollicari. — Sevier Co., Utah, on the edge of Aquarin's Plateau, at 8,700 feet, Lester F. Ward, in Powell's Expedition.

ASTRAGALUS NEWBERRYI. *Scytocarp*i: subcaulescens; caudicibus in radice elongato profundo brevissimis confertis; foliis argenteo-sericeis; foliolis 3-7 nunc lato- nunc angusto-obovatis approximatis (lin. 4-6 longis); pedunculis brevibus vel brevissimis paucifloris; calyce cylindræo sericeo, dentibus tubo plus dimidio brevioribus; corolla ochroleuca $\frac{3}{4}$ -pollicari, unguibus elongatis; legumine chartaceo ovato inflato villosa pollicari uniloculari, acumine lato lateraliter compresso subincurvo, suturis haud incrassatis nec intus nec extus prominulis. — *A. Chamæleuce*, Gray in Bot. Ives Colorad. Exp. 10, quoad pl. Newberry. — On the frontiers of Utah and Arizona, Prof. Newberry. Cañon east of Glenwood, Sevier Co., Utah, at 7,000 feet, Lester F. Ward, in Powell's Expedition, 1875. Having now the fruit, it is clear that Newberry's plant, in flower only, is not the same as *Phaca pygmaea*, Nutt., which should retain the name of *A. Chamæleuce*, while this may take that of the original discoverer.

ASTRAGALUS PATTERSONI. *Scytocarp*i: robustus, 1-2-pedalis, adpresso-puberulus, nunc glabellus; foliolis 6-10-jugis oblongis crassiusculis (semipoll. ad pollicem longis): pedunculis racemoso-plurifloris folium æquantibus vel superantibus; floribus mox pendulis ultra-semipollicaribus; calycis dentibus setaceo-subulatis tubo cylindræo dimidio brevioribus; corolla alba; carina apice nunc purpurascente; legumine ovali crasso-coriaceo inflato glabro (sæpius pollicari) polyspermo, basi intra calycem abrupte contracta substipitiforimi, suturis nec intrusis nec

extus prominulis. — Foot-hills of Gore Mountains, Colorado, H. N. Patterson. Rio McElmo, Southwestern Colorado, T. S. Brandegee, in Hayden's Expedition, 1875. Utah on Dirty-Devil River, and near Richfield, L. F. Ward, in Powell's Expedition, 1875. The two last in fruit only; while the fruit of Mr. Patterson's plant (who alone has found the flowers) is decidedly smaller, sometimes little over half an inch long.

ASTRAGALUS SUBCOMPRESSUS. *A. racemoso* sect. *Galegiformium* admodum similis; dentibus calycis brevioribus; corolla ochroleuca; legumine falcato lateraliter compresso intus septo completo bilocellato, sulco dorsali angusto subclauso, stipite e calycis tubo haud exserto. — S. W. Colorado, common at the altitude of 7,000 feet, T. S. Brandegee, in Hayden's Exped. 1875. Legumes an inch and a quarter or only an inch long, $2\frac{1}{2}$ to nearly 3 lines wide, the well-developed ones decidedly falcate; the partition about twice the length of the depth of the groove, which in the cross-section of the well-grown pod before dehiscence is oval and almost closed.

ASTRAGALUS HAYDENIANUS. *A. bisulcato* affinis, minor; pube magis cinerea; spica elongata virgata; floribus multo minoribus (lin. 3-4 longis); calycis dentibus subulatis tubo multo brevioribus; corolla alba, carina apice purpureo tincta; legumine ovali utrinque obtusissimo venis transversis ruguloso 6-7-ovulato 2-4-spermo, facie ventrali late profundeque impressa sutura costæformi valde prominente percursa, stipite calycem haud superante. — Common in S. W. Colorado, at the altitude of 7,000 feet, T. S. Brandegee, in Hayden's Expedition, 1875. Also banks of Grand River in Middle Park, H. N. Patterson. "Plant 2 or 3 feet high." Dedicated to Dr. F. V. Hayden, the Director of the expedition in which it was collected, and the distinguished explorer and surveyor of our whole Rocky Mountain district.

ASTRAGALUS TRICARINATUS. *A. arrecto* subsimilis, 1-2-pedalis; foliolis plurimis parvis (lin. 3-4 longis) ovalibus obovatisve emarginatis crassiusculis supra glabellis subtus cano-puberulis secus rhachin elongatam sat rigidam sparsis vel remotiusculis; racemis sparsifloris longe pedunculatis; bracteis ovato-subulatis minimis; floribus subpatentibus; calycis nigro-hirsutuli tubo brevi-campanulato pedicello æquilongis dentibus subulatis parum longiore; corolla ochroleuca seu flavida (semipollicem longa); ovario glaberrimo; legumine lato-lineari, maturo arcuato ultrapollicari coriaceo bilocellato quasi tricarinato, nempe dorso inter carinas obtusas late sulcato, ventre acutissime carinato, faciebus concavis, sectione transversa late Y-formi, stipite calycis tubo brevioris. — White Water, San Bernardino Co., California, Parry, 1876.

ASTRAGALUS HUMILLIMUS. Cæspitoso-depressus, condensatus; caudice lignescens; caulibus vix pollicaribus stipulis scariosis coalitis imbricato-tectis petiolis persistentibus hystricosis; foliolis 3-5-jugis oblongis canescentibus margine revolutis lineam longis demum deciduis; pedunculis brevibus 1-3-floris; calycis dentibus subulatis tubo oblongo-campanulato dimidio brevioribus; corolla pallida: legumine ovato coriaceo albido-pubescente parvo (lin. 2 longo) uniloculari 9-ovulato fere monospermo, suturis extus prominulis. — Flat rocky grounds on the Mesa Verde, S. W. Colorado, T. S. Brandegee, in Hayden's Expedition, 1875. Habit of *A. jejunus*, Watson, but much more dwarf and condensed, not rising more than 2 or 3 inches above the ground, and often choked in drifting sand. Persistent petioles and rhachis only an inch long, more rigid and spinescent than those of *A. jejunus*, which are also persistent: the pod decidedly different.

LESPEDEZA LEPTOSTACHYA, Engelm. in herb. Gray. Pubes undique adpressa argenteo-canescens; petiolo petiolulo terminali longiore; foliolis linearibus; spicis paniculatis gracilibus sublaxifloris longiuscule pedunculatis; legumine calycem adæquante vel subsuperante. — Minnesota, T. J. Hale. Illinois, Bebb. Iowa, T. C. Arthur, Bessey. Has passed for *L. angustifolia*, from which its slender spikes and paniculate habit at once distinguish it. Our species of the group are difficult and need revision, with very ample materials to be studied with the attention which Maximowicz has bestowed upon the Asiatic species. *L. capitata*, Michx., should be known by its very short petioles, short-peduncled and globular heads of flowers, and legume much shorter than the calyx; *L. angustifolia*, Ell., by smaller and often oblong heads, on distinct and sometimes slender peduncles, and legumes hardly shorter than the calyx, the leaflets linear; *L. hirta*, by pubescence of stem perhaps always spreading, leaflets from orbicular to narrow oblong, petioles mostly slender, oblong spikes on elongated peduncles, and legume at maturity hardly shorter than the calyx.

EPILOBIUM JUCUNDUM. *E. paniculato* affine; floribus multo majoribus thyrsoideo-paniculatis; calycis tubo ultra ovarium longe producto tubuloso-infundibuliformi; petalis læte purpureis late obcordatis semipollicaribus; antheris fere linearibus; stylo prælongo. — Scott Valley, Siskiyou Co., California, E. L. Greene, Aug. 28, 1876. A showy species, well worthy of cultivation, having flowers almost as large as those of *E. obcordatum*, and very numerous in a rather crowded panicle. The calyx beyond the ovary is half an inch long, more narrowly funnel-form than in *E. paniculatum*, the tubular part about equalling

the ovary; the petals are much broader as well as larger, and the anthers (of short-linear outline) fully twice longer.

GALIUM BRANDEGEEI. Cæ-pitoso-depressum, parvum, glabrum, lævissimum; radicibus fibrosis; foliis quaternis obovatis vel spathulatis fere aveniis lin. 1-3 longis; pedunculis unifloris solitariis binisve nudis; flore albido semi-lineam longo; fructu lævi glabro.—Valley of the Rio Grande, New Mexico, on Los Pinos Trail, at 9,000 feet, Sept., 1875, T. S. Brandegee, in Hayden's Expedition. Spreading extensively over the barely moist ground, evidently perennial; the stems only 2 or 3 inches long. We have no other North American species much resembling this.

BRICKELLIA GREENEI. Subsesquipedalis, pube viscidissima; caulibus usque ad capitula solitaria ramos terminantia foliosis; foliis caulinis ovatis obtusis medium versus inæqualiter serratis basi subtruncatis brevissime petiolatis, ramealibus oblongis subintegerrimis, summis capitulum involuerantibus eoque brevioribus; involuero proprio multifloro, squamis linearibus acuminatis glabellis, extimis brevioribus tantum lanceolatis; acheniis ad angulos hirtellis.—Siskiyou Co., California, on the south fork of Scott River, E. L. Greene, Aug. 24, 1876. Cauline leaves an inch long, thinnish; those of the short and somewhat corymbose flowering branches barely half an inch long. Head three quarters of an inch long.

BIGELOVIA VASEYI. *Chrysothamnus*: depressa, glabra, lævis; caulibus e basi decumbente erectis spithamæis; foliis angustis spathulato-linearibus obtusis: capitulis corymboso-confertis plerumque sessilibus; involuero angusto oblongo subclavato 5-floro, squamis minus carinatis oblongis obtusissimis chartaceis, exterioribus apice crassiore viridulo; appendicibus styli obtusiusculis parte stigmatica lineari dimidio brevioribus; ovario glaberrimo.—Colorado, in Middle Park, Dr. Geo. Vasey, in Powell's Exped., 1868. Utah, on Aquarin's Plateau, at 9,000 feet, L. F. Ward, in Powell's Exped., 1875. Leaves an inch or less in length, a line or less wide. Heads in Vasey's specimens 4 lines long, in Ward's better developed ones are 5 or almost 6 lines long; the scales of the involucre less carinate and less prominently straight ranked than in the related species; the greenish tips also suggesting the *Aplodiscus* section.

SOLIDAGO SPARSIFLORA. *Virgaurea*, *Virgata*: scabrido-puberula; foliis inferioribus ignotis, superioribus floralibusque parvulis lanceolatis (lin. 6-12 longis); racemulis oligocephalis laxis laxèque thyrsoides; involucri squamis linearibus puberulis apice viridulis acutiusculis; floribus radii circiter 10 ligulis parvulis, disci 4-5; acheniis sericeo-pubes-

centibus. — Arizona, near Camp Lowell, Sept., 1874. Rothrock, in Wheeler Expedition, 1874.

GYMNOLOMIA (HELIOMERIS) PORTERI. Annuæ, ramosa; foliis lanceolatis linearibusque plerisque alternis integerrimis margine inferne parce hispidis; capitulis cymoso-paniculatis, pedunculo gracili; involucri laxo e squamis anguste linearibus subfoliaceis fere uniseriatis ligulas subæquantibus; receptaculo alte conico; corolla disci fauce latissime campanulata lobis æquilonga, tubo abrupto brevi basi incrassato; stylo basi bulboso, ramis hispidulis appendice tenuiter subulata hispida terminatis; acheniis turgidis hispidulis calvis, marginibus ad apicem latum truncatum in umbonem parvum productis, areola parva vix annulata. — *Rudbeckia?* *Porteri*, Gray, Pl. Fendl. 83. Stone Mountain, Upper Georgia, Porter, Hendee, Ravenel, and later Engelmann and Canby, August and September.

PALAFOXIA FEAYI. Scabra; foliis oblongis lanceolatisque basi vel utrinque obtusis (pollicaribus); capitulis subcymosis; involucri e squamis linearibus obtusis floribus 2–3-plo brevioribus pedunculisque eglandulosis; corollæ fauce cylindræca lobisque breviusculis *P. linearifoliæ*; pappi paleis oblongis obtusis basi incrassatis achenio multoties corollæ tubo dimidio brevioribus. — S. Florida, Dr. William T. Feay, Dr. Chapman.

HULSEA PARRYI. Humilis; foliis plerisque radicalibus confertis spathulatis inæqualiter argute dentatis primum albo-lanuginosis; caulibus floriferis plurimis scapiformibus (spithamæis) gracilibus glabellis simplicibus monocephalis vel basi divisis bracteis paucis linearibus subulatisve instructis; capitulo pro genere parvo (semipollicem alto); involucri viscoso-pubescente, squamis lato-linearibus flores disci ligulasque paucas inconspicuas subæquantibus; pappi paleis oblongis parum erosis subæqualibus. — S. E. California, in the Mohave district, Dr. Parry, 1876. The flowers appear to be yellow, with tips disposed to turn to purple.

GAILLARDIA SPATHULATA. *G. acaulis* spec. insigni peraffinis; caulibus spithamæis e caudice perenni multicipiti plurimis plerumque ramosis foliatis; foliis spathulatis integerrimis basi sensim attenuata sessilibus; pedunculo breviusculo, pappi paleis 9–11 oblongis longius aristatis, arista corollam disci mox superante. — S. Utah, in Rabbit Valley, at 7,000 feet, L. F. Ward, in Powell's Exped., 1875. Leaves, as in *G. acaulis*, thickish and firm; the larger a full inch long; the uppermost reduced to half or a third of an inch. Heads rather smaller than in *G. acaulis*, on a slender terminal peduncle of an inch or two in length. Disk-corollas 3 lines long.

TETRADYMIA COMOSA. *Lagothamnus*: lana gnaphaloidea dealbata, 3-4-pedalis; ramis ramulisque erectis; foliis sparsis linearibus planis (sæpe ultra-pollicaribus) cuspidato-mucronatis aut deciduis aut nonnullis in spinam modice induratum persistentem mutatis; fasciculis axillaribus nullis; capitulis ad apicem ramosum corymboso-cymulosis; cæterum fere *T. spinosæ*. — W. Nevada, Lemmon. S. E. borders of California, E. Palmer. Potrero, San Diego Co., D. Cleveland.

NEMACLADUS LONGIFLORUS. Foliis radicalibus magis cano-hirtis; corolla tubulosa sepalis æqualibus a basi fere discretis sublinearibus 3-4-plo longioribus, tubo fere integro; filamentis longius monadelphis; ovario fusiformi; capsula oblonga septo contrario subcompressa calyce libero plus duplo longiore; seminibus turgide ovalibus. — S. E. California, Wallace, Lemmon. A specimen of this, collected by Mr. Wallace (probably between Los Angeles and San Bernardino), has long been in our herbarium, but the characters have been noticed only now upon the coming of fine specimens collected recently by Mr. Lemmon. The flowers and fruit differ strikingly from those of *N. ramosissimus*, and call for emendation of the generic character. In the new species the calyx is actually free from the ovary and capsule, and 5-parted to the base, and the long and narrow capsule is 2-valved from top to bottom. It is very interesting to have a second species of this remarkable genus; but it throws no additional light upon its affinities.

LOBELIA LUDOVICIANA. Inter *L. paludosam* et *L. appendiculatam* quasi media, glabra, caule 2-3-pedali gracili folioso; foliis crassiusculis basi angustatis, superioribus lanceolatis acutis, inferioribus petiolatis, imis spathulatis obtusis; racemo nudo laxo 5-20-floro; floribus secundis horizontalibus puberulis; corolla cærulea semipollicari; calycis tubo fere hemisphærico, lobis ovato- seu (auriculis brevibus integris reflexis) cordato-lanceolatis tubo corollæ dimidio brevioribus capsula parum longioribus margine sæpius integerrimis; antheris majoribus superne hirsutis, apice imberbi. — In wet prairies, Western Louisiana, J. Hale; Texas, near Houston, Lindheimer.

LOBELIA FEAYANA. *L. Cliffortianæ* et *L. Berlandieri* affinis, glabra, annua; caulibus spithamæis ramosis diffusis tenellis; foliis ($\frac{1}{4}$ - $\frac{1}{2}$ -pollicaribus) obovatis vel rotundatis petiolatis repando-denticulatis, summisve spathulatis seu lanceolatis sessilibus; racemis nudis pedunculatis laxo 4-10-floris; pedicellis (lin. 2-4 longis) flori æquilongis bractea subulata 2-3-plo longioribus; calycis tubo capsulaque ($\frac{2}{3}$ infra) lato-obconicis, sinibus nudis, lobis subulatis tubo corollæ læte cæruleæ (parum lin. 2 longæ) dimidio brevioribus apicem liberum capsulæ vix superantibus; antheris glabris, brevioribus apice barbularis; seminibus

oblongis, testa cellulosa. — Eastern and Southern Florida, Dr. Feay, Dr. E. Palmer, Mrs. Treat, &c.

ARCTOSTAPHYLOS CLEVELANDI. *A. bicoloris* quoad folia et tomentum sat similis, bipedalis; ramis longe crebreque foliosis; foliis subsessilibus oblongis sublanceolatis cuspidato-acuminatis supra mox glabratis nitidulis subtus albido-tomentulosis; racemis folioso-bracteatis; pedicellis bractea brevioribus flore duplo longioribus supra medium folioso-bibracteolatis; sepalis ovatis imbricatis tomentosis; corolla brevi-oblonga sub-urceolata (lin. 4 longa) albida multinervulosa; filamentis subulatis villosis; stigmatibus capitato; disco hypogyno ovarii glabri dimidium æquante: drupa ignota. — Potrero, San Diego Co., California, D. Cleveland, 1876. In flower Sept. 20.

RHODODENDRON CHAPMANII. *R. punctato* perquam similis; ramis rigidioribus erectis; foliis crassioribus minus petiolatis; floribus præcioribus; corollæ infundibuliformis lobis ovatis tubo staminibus styloque brevioribus; seminibus anguste oblongis. — *R. punctatum* var. Chapm. Fl. 266. — Sandy pine barrens of W. Florida, Dr. Chapman.

CLETHRA, PYROLA, etc. The early view that the anthers of *Pyroleæ* are in normal position in the bud (in other words, that they are extrorse and the foramina basal), to which I reverted in the later editions of the Manual of Bot. N. U. States, upon some observations by the late Prof. H. J. Clark, must be adhered to. Baillon, indeed (in *Adansonia*, i. 194), states the contrary with much particularity, apparently from direct observation: "Chaque loge se termine en un tube à pore de dehiscence apical. L'anthere est introrse quand le pore est en haut; elle est, par conséquent, extrorse quand le pore regarde en bas. Le filet est dans son jeune âge rectiligne et dressé. Plus tard il s'allonge beaucoup et s'infléchit en se moulant sur la convexité de l'anthere. Lors de l'épanouissement complet, il se redresse une seconde fois en totalité." I can affirm, on the contrary, that the anthers are developed from the first in this extrorse position, and undergo no inversion in the bud; indeed, the anther is well formed and the basal horns plainly recognizable before the filament has an appreciable length, at least such as would allow the former to execute the supposed "mouvement de bascule."

Clethra agrees with the *Pyroleæ* in having primarily extrorse anthers, as well as in the simple pollen and completely polypetalous corolla. These characters are fully equal in value to those upon which De Candolle and others break up the original *Ericaceæ* into separate orders, and, if apprehended by Bentham and Hooker, might have led them to give ordinal rank to the *Pyroleæ*, appending *Clethra*, which they

almost exclude from *Ericaceæ*. Much preferring to retain the order as a great whole, I would combine *Clethra* and the tribe *Pyroleæ* into the third suborder, *Fyrolineæ*.

GALAX APHYLLA, Linn. The name first appears in the first edition of the *Species Plantarum*, p. 200, in 1753. Neither generic nor specific name has any fitness; the herb is not milky, nor is it leafless, except as to the scape. The plant in view, the *Anonymos s. Belvedere*, of Clayton, is recognizable by the good generic character in the first edition of the *Flora Virginica*, and from Clayton's herbarium. The generic character of *Galax* first appears a year later, in the 5th edition of the *Genera Plantarum*, and it is, as has been noted, utterly incongruous with Clayton's plant, to which Linnæus meant to apply it. This generic character Linnæus copied from Mitchell's *Nova Plantarum Genera*, viz., from his *Viticella*, merely substituting the name of *Galax*. Consequently not a word of the Linnæan generic character is applicable to *Galax aphylla*, Linnæus's only species; wherefore it is not surprising that Andrews, Richard, and Ventenat should have respectively described that plant under other generic names. Although the contradiction was long ago pointed out, still most authors, down to Endlicher, De Candolle, and later, have followed Linnæus in citing *Viticella* as a synonym of *Galax*. Gronovius, in the second edition of the *Flora Virginica*, was evidently struck by this total discrepancy; and he covered it in a curious way, by omitting altogether the correct character of Clayton's plant, as printed in the original edition. It was reserved for Mr. Bentham to divine what Mitchell's *Viticella* really is, viz., *Hydrophyllum appendiculatum*, to which the name of *Galax* etymologically is equally inapplicable. See Benth. & Hook. Gen. ii. 827.

STEIRONEMA, Raf. in Ann. Gen. Phys. Brux. vii. 192 (1820). Genus between *Trientalis* and *Lysimachia*, distinguished from both by the presence of staminodia (the rudiments of the other series of stamens) between the fertile filaments, and by the æstivation of the corolla, in which each division is separately involute around, or even convolutely enwraps the stamen before it. The latter character, which I have recently ascertained, is not alluded to by Baudo in his index of the caulescent *Anagallideæ* (Ann. Sci. Nat. ser. 2, xx.), nor by Bentham and Hooker in the second volume of the *Genera Plantarum*, in which the æstivation of the corolla is first systematically employed in the arrangement of this order.* Following Bigelow (§ *Seleucia*) I had

* The tribe *Lysimachieæ* is characterized as having convolute (or "contorted") æstivation of the corolla; the *Primuleæ*, by quincuncially imbricated. This

long ago marked out *Steironema* as a subgenus; but this new particular warrants the complete separation.

The species are not easy to define, as they incline to run into each other. But they are on the whole tolerably well distinguished in the later editions of the Manual of the Botany of the N. United States. They are:—

S. CILIATUM. (*S. ciliata*, Raf. l. c.)

S. RADICANS. *Lysimachia radicans*, Hook. Companion to Bot. Mag. i. 177.

S. LANCEOLATUM. (*S. heterophylla*, Raf. & *S. florida*, Baudo, mainly.) *Lysimachia lanceolata*, Walt. Var. HYBRIDUM, the *L. hybrida*, Michx. Var. ANGUSTIFOLIUM, the *L. angustifolia*, Lam., and *L. heterophylla*, Michx.

S. LONGIFOLIUM. (*S. longifolia?* & *S. revoluta*, Raf.) The oldest specific name is *Lysimachia quadriflora*, Sims, Bot. Mag. t. 660, but that name is an inappropriate and deceptive one. *L. longifolia*, Pursh, is only a little later, and is unobjectionable.

FRAXINUS GREGGII. *Ornus*: fruticosa, glabra; ramis gracilibus teretibus; foliis 3–7 angusto-spathulatis seu oblongo-obovatis obtusis obtuse paucidentatis vel integerrimis planis coriaceis fere aveniis sessilibus parvis, petiolo inter foliola alato-marginato; samara oblongo-lineari apice retusa stylo brevissimo apiculata. — *F. Schiedeana* var. *parvifolia*, Torr. Bot. Mex. Bound. 166. — S. W. Texas, and adjacent parts of Mexico, Gregg, Schott, Bigelow, Parry.

FORESTIERA NEO-MEXICANA. *F. acuminata* proxima; foliis minoribus (pollicaribus) spathulato-oblongis apice obtusis vel obtuse subacuminatis brevi-petiolatis; floribus fœmineis fasciculatis (haud paniculatis); calyce minuto subpersistente; drupis brevi-oblongis vel ovoideis obtusis. — *F. acuminata* var. *parvifolia*, Gray, Proc. Am. Acad. iv. 364. — New Mexico, Fendler, C. Wright, Palmer, Brandegee.

holds well, the anomalous case of *Steironema* excepted, yet with somewhat of the gradations which are almost everywhere apt to occur between these two modes. On the one hand some *Primulæ* (notably *P. Boveana*) will occasionally have three of the lobes in the "contorted" fashion, and only two wholly covered; on the other, species of *Lysimachia*, such as *L. clethroides*, not rarely present flowers with one lobe wholly exterior and one wholly interior. By suppressing the tribe *Lysimachieæ*, *Cyclamen* and *Dodecatheon* are brought into juxtaposition, and the four tribes are made to rest on stable characters, — *Hottoniæ* on the anatropous ovules, *Corideæ* on the irregular flowers, and *Samoleæ* on the adnation of the base of calyx and ovary.

The authors of the Genera Plantarum have overlooked the heterogone dimorphism of the flowers of *Hottonia*.

AMSONIA BREVIFOLIA. Glabra; foliis ovatis vel superioribus lanceolatis crassiusculis basi angustata subsessilibus; corollæ lobis ovatis oblongisve tubo subclavato dimidio brevioribus, fauce sub ore tantum barbato: stigmatе subtrochleari apice bilobato; folliculis moniliformitosis in articulis turgidis facile secedentibus. — S. Utah and W. Arizona, to the border of California, Mrs. Thompson, Dr. Parry, Dr. Palmer. There are four western species, forming a section, characterized by having a bilobed tip to the stigma, and the more or less clavate tube to the corolla always longer than the lobes; the calyx deeply parted into attenuate-subulate divisions (2 or 3 lines long); the stems lower, more branched, and bearing smaller or simpler flower-clusters than the eastern species. Of these the present and the nearly related *A. tomentosa*, Torr., have very torose follicles, disposed when dry to break up into joints. *A. longiflora*, Torr., and the following appear always to produce slender and continuous follicles, and have a tube to the corolla four or five times the length of the lobes.

AMSONIA PALMERI. Glabra; foliis angusto-lanceolatis linearibusque sessilibus; corollæ albæ lobis ovatis (lin. $1\frac{1}{2}$ –2 longis) tubo clavato intus longe barbato 3–4-plo brevioribus; stigmatе didymo hirtello; folliculis gracilibus continuis. — Arizona, Dr. Palmer. Described from specimens raised from seed collected by Dr. Palmer. Intermediate in appearance between *A. tomentosa*, which is sometimes glabrous, and *A. longiflora*. The stigma consists of two thick lobes, which are distinct almost down to the reflexed ring or collar. The eastern species, reducible to two, have a depressed-capitate stigma, truncate and entire at the apex.

PHILIBERTIA TORREYI. Velutino-pubescent; foliis cordato-lanceolatis vel sagittatis acuminatis; pedunculis folia æquantibus 10–15-floris; corollæ ut videtur albæ (lin. 8–9 diametro) lobis late ovatis obtusis extus puberulis villosissimo-ciliatis pedicello parum brevioribus; columna filamentorum vix ulla. — *Sarcostemma elegans?* Torr. Bot. Mex. Bound. 162, non Decaisne. — S. W. Texas, Parry, Bigelow. *P. elegans* is less pubescent, has smoother corolla variegated with purple within, narrower lobes, and a manifest column. *P. cynanchoides* (*Sarcostemma cynanchoides*, Decaisne in DC.) is a variable species, with smaller and more numerous flowers, on longer filiform pedicels, the smoothish corolla barely ciliate. *P. linearis* is a variable low species, of which *Sarcostemma heterophyllum*, Engelm., appears to be a form approaching the narrowest-leaved *P. cynanchoides*; and var. *hirtella* (*Sarcostemma*, Bot. Calif.), a narrow-leaved and pubescent form, the leaves rarely auriculate or cordate at base. *P. viminalis*

(*Asclepias viminalis*, Swartz) appears to be the most proper name for the *Sarcostemma Brownii* (not *Brownei*) of Meyer and Grisebach, *S. clausum* of Decaisne, mainly, and *S. crassifolium* of Chapman. *P. undulata* (*Sarcostemma undulatum*, Torr. l. c.) is our only species with a conspicuous column, somewhat longer than the tumid scales of the staminal corona.

ASCLEPIAS, &c. In elaborating this genus and its allies for the North American Flora, the limitation of the genera has to be considered. More than thirty years ago this work was done by the excellent Decaisne for De Candolle's Prodrômus, evidently in a hurried way; Dr. Engelmann and the late Dr. Torrey have published important details; and the former has supplied me with full notes and many sketches of his elaborate studies, which, unfortunately, have for a long time remained unpublished. For his recent elaboration of the whole order in the new Genera Plantarum, Mr. Bentham could not critically examine all the species. Had he done so, he would probably have either re-established Nuttall's *Anantherix* (as Dr. Engelmann in his notes long ago proposed), or he would have remanded it to *Asclepias*. The process of the hood, specially characteristic of this last genus, although generally corniform, not very rarely takes the form of a pointless crest or plate, like that which in *Anantherix* divides at least the upper part of the cavity. Then *Acerates angustifolia* (*Polyotus*, Nutt.), as Nuttall intimated, has the technical character of *Asclepias* in a reduced form. I think I have found a character in the anthers, which may be turned to useful account; and it may be of no disadvantage that, while distinguishing *Acerates* from *Gomphocarpus* (the latter sufficiently heterogeneous without the addition of the former), it helps to separate Nuttall's original *Anantherix* (the anomalous *Asclepias connivens* of Baldwin) from the two more common species which Nuttall long afterwards added to it, along even with *Podostigma*, his *Stylandra*.

I venture to rearrange the genera in question, in the manner proposed in the foot-note.*

* SYNOPSIS.

A. Cuculli coronæ basilares intus nudi, ab antheras longe remoti.

PODOSTIGMA, Ell. Corollæ lobi campanulato-erecti. Columna staminea prælonga. Antherarum alæ triangulares basi lata truncata.

B. Cuculli (aut basilares aut in columna brevi pl. m. elevati) antheris proximæ: corolla rotato-patens vel reflexa.

* Cuculli intus processu dorsali vel subbasilari corniformi seu cristæformi aucti.

To obviate confusion or mistake which may arise as to the priority of Elliott's names over those of Nuttall, it should be recorded that, al-

ANANTHERIX, Nutt. (Gen.) Corolla sub anthesi reflexa. Columna sub cucullis brevissima. Cuculli adsurgentes, corollæ æquilongi, antheras longe superantes, oblongo-clavati apice incurvo, a latere compressi, præter marginem ventralem anguste apiceque dilatato-bilamellatum solidi, crista obtusissima inclusa. Antherarum alæ membranaceæ, deorsum valde dilatatæ, latissimæ, basi horizontaliter truncatæ. Caudiculæ capillares polliniis oblongis 2-3 plo longiores! Folia opposita.—A. CONNIVENS. *A. viridis*, Nutt. Gen. excl. syn. *Asclepias viridis*, Walt.

ASCLEPIODORA. Corolla rotato-patens. Cuculli basillares columnæ brevissimæ totæ inserti, patenti-adsurgentes, calceoliformes, prorsus cavi, versus apicem crista lamelliformi quasi bilocellati. Antherarum alæ corneæ basi pl. m. angustatæ. Caudiculæ polliniis pyriformibus breviores. Folia sæpius alterna.—A. VIRIDIS. *Asclepias viridis*, Walt. *Anantherix paniculatus*, Nutt. Trans. Am. Phil. Soc. v. 202. *Acerates paniculata*, Decaisne.—A. DECUMBENS. *Anantherix decumbens*, Nutt. l. c.

ASCLEPIAS, L. Corolla sub anthesi fere semper reflexa. Cuculli intus processu corniformi vel cristæformi aucti. Antherarum alæ corneæ deorsum usque ad basim truncatam seu late rotundatam dilatatæ. Folia sæpius opposita.

* * Cuculli intus prorsus inappendiculati: corolla sub anthesi reflexa.

ACERATES, Ell. Cuculli involuto-concavi, intus aperti. Antherarum alæ medio vel supra medium (nec basi) dilatatæ vel angulatæ. Folia sæpius alterna vel subalterna. Cæt. *Asclepiadis*.

SCHIZONOTUS. Cuculli saccati, ovales, intus toto longitudine columnæ adnati, extus longitudinaliter bivalves. Antheræ, etc., *Aceratis*. Folia opposita.—S. PURPURASCENS. *Gomphocarpus purpurascens*, Gray, Bot. Calif. i. 477.

GOMPHOCARPUS, R. Br. Cuculli intus vel apice aperti. Antheræ, etc., *Asclepiadis*.

ASCLEPIAS, L.

An American genus except for two African species, mainly North American. I do not see the way to a really natural arrangement of our species; but the following may serve as a key to them.

§ 1. Cuculli sessiles, nec basi attenuati: antherarum alæ basi late angulato-truncatæ vel auriculato-deflexæ, rarius rotundatæ.

* Corolla cum corona aurantiaca: folliculi nudi in pedicello decurvo arrecti: folia pleraque alterna vel sparsa: herba non lactescens!

A. TUBEROSA, L., et var. DECUMBENS.

* * Corolla læte rubra vel purpurea: folliculi nudi, in pedicello decurvo arrecti, *A. Curassavica* & *A. incarnata* exceptæ.

+ Cuculli aurantiaci: columna sat longa: herbæ glabræ.

A. CURASSAVICA, L. Naturalized if not native in Florida, &c.; now widely dispersed over the tropical coasts.

A. PAUPERCUA, Michx. *A. lanceolata*, Walt., a name which might be restored.

though the first volume of Elliott's work bears the date of 1821 upon the title-page, the first fasciculus was issued in the year 1816, and re-

+ + Cuculli purpurei vel purpurascens : umbellæ multifloræ.

A. RUBRA, L., which is founded on Clayton's no. 263 in Gronov. Fl. Virg., with uppermost leaves accidentally alternate.

A. PURPURASCENS, L., founded on Dill. Elth. t. 28, and Herm. Parad. Bot. 33. A. *amœna*, L., founded on Dill. Elth. t. 27, not of herb. L., which is *A. variegata*.

A. INCARNATA, L., with var. PULCHRA, Pers., and var. LONGIFOLIA, the latter a Texan and New Mexican narrow-leaved form.

* * * Corolla et corona viridulæ, flavescens, albæ, nunc sordide vel pallide purpurascens.

+ Folliculi processibus mollibus echinati, crebre tomentosi, turgidi, in pedicellis deflexis arrecti : plantæ tomentosæ.

A. SPECIOSA, Torr. A. *Douglasii*, Hook.

A. CORNUTI, Decaisne. A. *Syriaca*, L.

+ + Folliculi rostro tantum parce verrucoso-echinulato : herba glabra.

A. SULLIVANTII, Engelm.

+ + + Folliculi læves, aut glabri aut tomentulosi,

+ + In pedicellis deflexis vel decurvis arrecti.

= Umbella in pedunculo elongato caulem simplicem terminante solitaria : folia arcte sessilia seu amplexicaulia : plantæ glaberrimæ glaucescentes.

A. OBTUSIFOLIA, L. A. *purpurascens*, Walt. Car. 103.

A. MEADII, Torr. in Gray, Man. ed. 2, addend. ; ed. 5, 397.

= = Umbellæ in caule elato 2-4 ; pedunculis folia lata oblonga æquantibus vel superantibus : herba præter inflorescentiam glabra.

A. GLAUDESCENS, HBK. Specimens of this Mexican species were collected in S. W. Texas, and referred in the Botany of the Mexican Boundary Survey to *A. Sullivanii*.

= = = Umbellæ pedunculo caulibus abbreviatis foliisque orbicularibus longiore.

A. NUMMULARIA, Torr. Bot. Mex. Bound. 163, t. 45.

= = = = Umbellæ 2-3 vel plures, raro solitariæ ; pedunculis (*A. cinerea* excepta) folia haud superantibus.

a. Folia lata seu latiuscula, sat magna : cuculli lati antheras vix parumve superantes : caules dodrantaes ad 4-pedales.

1. Herbæ glabræ vel primum puberulæ, nunquam floccosæ.

A. CRYPTOCERAS, Watson, Bot. King, 283, t. 28. Sat humilis, decumbens, rotundifolia ; cucullis saccato-ovatis apice bi-acuminatis cornu includentibus.

A. AMPLEXICAULIS, Michx. Decumbens ; foliis carnosulis cordatis amplexantibus ; cucullis obovato-truncatis, cornu fere incluso. — *A. humistrata*, Walt., " floribus rubris " exceptis.

issued, with the second fasciculus, before the close of that year; and the third and fourth appeared before November, 1817,—the latter

A. JAMESII, Torr. Adscendens, subpedalis, primum farinoso-pubera; foliis orbiculatis seu late ovalibus crassis; cucullis latis apice truncatis, cornu cristæ-formi falcato parum exserto.

A. PHYTOLACCOIDES, Pursh. Glabra, 4-5-pedalis; umbellæ laxæ pedicellis filiformibus elongatis; corolla viridula; cucullis albis vel subroseis eroso-truncatis angulis internis in dentem longe productis, cornu erecto tenui-subulato exserto. — *A. nivea*, Bot. Mag. t. 481, non L.

A. VARIEGATA, L. Glabra vel glabrata, 1-2-pedalis; umbellis compactis brevi-pedunculatis; corolla alba basi cucullisque ventricosis purpureo tinctis; cornu falcato-subulato brevi-exserto. — Founded wholly on syn. Dill. & Pluk. *A. nivea*, L. in part, as to syn. Gronov. & herb.

2. Tomentosa vel pubescens: umbellæ laterales brevi-pedunculatæ: flores viriduli: cuculli truncati: folliculi tomentosi vel canescens. Cismontanæ.

A. TOMENTOSA, Ell. Cuculli in columna brevissima antheris breviores, processu vix exserto.

A. ARENARIA, Torr. Bot. Mex. Bound. 162. Cuculli antheras superantes, processu horizontaliter exserto.

3. Floccoso-lanuginosæ vel canescentes, demum nunc glabratae; caules robusti: folliculi ovati. Ultramontanæ.

o Cuculli erecti apice horizontaliter truncati: herbæ pube brevi seu lana adpressa primum dealbata: umbellæ pedunculatæ, pedicellis lanuginosis.

A. FREMONTI, Torr. Pacif. R. Rep. vi. 87, sine char. Canescenti-tomentosa vel pubera; foliis ovalibus vel oblongis obtusis retusive nunc subcordatis petiolatis, margine lævi; corollæ albidæ lobis oblongo-ovatis; columna brevissima; cucullis antheris æquilongis marginibus antice in dentem productis, processu lato apice subulato inflexo parum exserto. — Northern California, Fremont, Newberry. Not since met with.

A. EROSA, Torr. Bot. Mex. Bound. 162. *A. leucophylla*, Engelm. in Am. Nat. ix. 349; Gray, Bot. Calif. i. 476. — This species proves to have been first described by Dr. Torrey, on a glabrate state of the plant which, in the younger and white-lanuginous condition, appropriately received from Dr. Engelmann the name of *A. leucophylla*. Completely glabrate specimens have since come in. The rough erosion of the edges of the leaves, to which the original name refers, is evident in all the specimens.

o o Cuculli ventricosi, processu lato incluso: herbæ lana longiore floccosa vestitæ. Californicæ.

A. ERIOCARPA, Benth. Umbellæ pedunculatæ.

A. VESTITA, Hook. & Arn. Umbellæ laterales sessiles.

b. Folia angusta, glabra; caules humiles ramosi: cuculli obtusi antheris breviores vel paullo longiores: folliculi ovati: umbellæ paucifloræ.

A. BRACHYSTEPHANA, Engelm. in Torr. Bot. Mex. Bound. 163. Cuculli brevissimi.

containing the genera in question. Nuttall's Genera of North American Plants appeared as a whole in the year 1818, the copyright bearing the date of April 3 of that year.

A. INVOLUCRATA, Engelm. l. c. Umbella foliis quasi involucrata.

c. Folia angustissima: caules humiles insigniter ramosi: cuculli lanceolato-subulati longissimi, basi concavi.

A. MACROTIS, Torr. Bot. Mex. Bound. 164, t. 45. A peculiar species.

d. Folia ovata seu oblonga, pubescentia vel glabella: caules erecti 1-2-pedales: cuculli oblongi, antheris 2-3-plo longiores, apice integerrimo rotundato.

1. Cuculli involuto-concavi, supra medium a processu corniformi apice incurvo vel inflexo exserto liberi: folliculi tomentosi vel pubescentes.

A. OVALIFOLIA, Decaisne in DC. *A. variegata* var., Hook. Fl. Bor.-Am. ii. 252, t. 141. *A. Nuttalliana*, Gray, Man. ed. 2, non Torr. — The habitat, "California," assigned to this species by Decaisne, stood in the way of its identification. The following, from a more south-westerly district, which I confounded with it, appears to be quite distinct.

A. HALLII. Puberula, mox glabrata: foliis crassiusculis ovato-seu oblongo-lanceolatis subacutis basi rotundatis brevi-petiolatis, costa valida, venis leviter adscendentibus rectis subtus prominulis: umbellis multifloris paucis corymbosis pedunculatis; corollæ viridulo-albæ purpurascentis lobis oblongis: cucullis elongato-oblongis integerrimis basi hastato-bigibbosis cornu sicæforme parum superantibus. — *A. ovalifolia*, Gray in Proc. Acad. Philad. 1863, 75. — Colorado; near Denver, E. Hall, no. 480. Upper Arkansas River, T. C. Porter. In aspect this most resembles *A. Sullivantii*. The follicles are not known; but the anther-wings are destitute of the corniculations at the basal angle which are conspicuous in the latter species.

A. OBOVATA, Ell. Sk. i. 321. A well-marked species, with somewhat the aspect of *Acerates viridiflora*. The anther-wings are manifestly bicorniculate at the salient basal angle. The hoods are dorsally somewhat hastately bigibbous above the short contracted base, and from the gibbosity are narrowly wing-appendaged upward and inward for some distance: the inner margins of the hood entire, straight, and so involute as to meet vertically for almost the whole length: at the very base inside is a pair of short and roundish fleshy internal auricles. The abruptly inflexed apex of the horn is subulate and traversed with a dorsal groove or channel.

2. Cuculli a latere complanati, solidi, margine ventrali petaloideo-bilamellato, lamellis semi-obovatis, parte dilatata cristam subconformem eroso-truncatam includente, angulo interno processu subulato breviter exserto apiculato.

A. NYCTAGINIFOLIA. Scabrido-puberula; caule ut videtur pedali adsurgente: foliis ovatis subrhombis basi in petiolum sat longum contractis, venis adscendentibus: umbellis axillaribus 4-8-floris brevissime pedunculatis; pedicellis petiolo æquilongis; corolla viridula semipollicari, lobis oblongis; cucullis erectis antheris subtriplo longioribus: columna sub corona vix ulla: antherarum alis

MELINIA ANGUSTIFOLIA. Fere glabra, subvolubilis; caulibus filiformibus; foliis angustissime linearibus petiolatis; pedunculis brevibus

basi rotundatis. — Rock Spring, Providence Mountains, S. E. California, Palmer, 1876. — Belongs, with the preceding and the following, to the *Otaria* section of Kunth and Decaisne; but with a peculiar hood, not unlike that of *A. Coulteri* (infra) and certainly much like that of the original *Anantherix*. The crest is produced at its internal angle into the horn which is the distinguishing mark of *Asclepias*.

++ ++ Folliculi in pedicellis recurvis patulisve penduli vel patentes: caules elati junciformes, foliis subulato-filiformibus delapsis nudi: cucullis panduratis erectis antheras longius superantibus: processu cristæformi adnato intus brevissime cornuto.

A. SUBULATA, Decaisne in DC. l. c.; Torr. in Pacif. R. Rep. v. 362, t. 7. — This remarkable *Asclepias* of the S. Californian and Arizonian desert appears to be the Mexican species briefly described by Decaisne; but a comparison of specimens should be made.

++ ++ ++ Folliculi (tamquam noti) in pedicellis adscendentibus erecti, sæpius fusiformes.

= Folia lata plerumque quaterna: flores roseo-albi.

A. QUADRIFOLIA, L. A pretty species, with the middle leaves almost always in whorls of four.

= = Folia lata vel latiuscula opposita, nec verticillata: flores parvi albi.

A. PERENNIS, Walt. *A. parviflora*, Ait., published one year later. *A. debilis*, Michx., partly confused with *A. quadrifolia*, to which the "Obs." relates. Towards its northern limits this species commonly wants the coma to the seeds. — Var. **PARVULA** is a low and remarkably small-leaved form of the species, from W. Texas, mentioned by Torrey in Bot. Mex. Bound. 164. — The two following related species are not known to occur within the United States; and the last by its narrow leaves would belong to the next division. They are introduced in reference to the synonymy.

A. NIVEA, L. (non herb., but the *Apocynum Persicariæ mitis*, etc., Dill. Elth. t. 29, and *A. Americanum*, etc., Plum. t. 30, on which the species was founded), Griseb. Fl. W. Ind. 419, excl. syn. Bot. Mag. (which belongs to *A. phytolaccoides*), is West Indian, and probably not in Louisiana, to which Grisebach credits it. It is distinguished from *A. perennis* by the greenish-white corolla, longer hoods with shorter horn, and an undulation near the base of the anther-wings, at least when dry.

A. VIRGATA, Lagasca, Gen. & Spec. 14, is Mexican, and resembles the preceding in the flowers; but the petals are white, or sometimes rose-tinted (as in Brit. Fl. Gard. ser. 2, t. 85), the anther-wings plane, and the leaves linear or linear-lanceolate and less petioled. From Kunth's character (but not that of Decaisne) it may be the *A. linifolia*, HBK. I have seen only cultivated specimens, under the name of *A. angustifolia* and of *A. linearis*.

= = = Folia angusta seu angustissima (elongato-lanceolata ad lineari-filiformia), in sp. nonnullis verticillata, in unica alterna.

bibracteolatis plerumque unifloris nunc geminis; corolla campanulata fere 5-partita sepalis lanceolatis acuminatis parum longiore, lobis

a. Corolla reflexa generis: cuculli cornu subulato exserto instructi.

1. Columna sub cucullis conspicua, antheris parum dimidio brevior.

A. MEXICANA, Cav. Ic. i. 42, t. 58. *A. fascicularis*, Decaisne in DC. *A. macrophylla*, Nutt. Pl. Gamb. 180. This species, which is common from Oregon to the borders of Mexico, appears to be identical with specimens collected in the valley of Mexico by Bourgeau (no. 63), and by Ghiesbreght still farther south. The figure in the Icones of Cavanilles very well represents it.

A. VERTICILLATA, L. A widely distributed species, including *A. galioides*, HBK., of Mexico. Var. PUMILA is a singularly dwarf or depauperate form, of the western dry plains, from Nebraska to New Mexico. Var. SUBVERTICILLATA (*A. verticillata* var. *galioides*, Torr. Bot. Mex. Bound. 164, chiefly), is a marked form, with single stems, simple or branched, the leaves mostly in pairs and threes, and their margins little revolute, the horns of the hoods rather less exserted. Decaisne's *A. verticillata* var. *linifolia* may include this; but it is evidently a mixture of *A. verticillata* (to which the specimens from "Florida and Georgia" may belong); of *A. virgata*, Lag. (*A. angustifolia*, Roem. & Schult. &c.), which, from Kunth's character of opposite leaves and little exserted horn, may be *A. linifolia*, HBK.; and of *A. Mexicana*, Cav. (from which may come the character of leaves 4-6-nate), which must be identical with *A. fascicularis* of Decaisne. Here also *A. linearis*, Scheele in Linnæa, xxi.

(A. LINARIA, Cav., a Mexican species which has been associated with *A. verticillata*, differs much in the very short staminal column, short and almost included horns, and in the ovate follicles becoming erect on the decurved pedicel, which is not known to occur in any species of this section.)

2. Columna brevis crassior.

A. QUINQUEDENTATA. Facie fere *A. verticillatæ* var. *subverticillatæ*; foliis omnibus oppositis angusto-linearibus elongatis; umbellis paucifloris longiusculo pedunculatis; corollæ virescenti-albæ lobis ovalibus (lin. $2\frac{1}{2}$ -3 longis); cucullis antheris æquilongis columna triplo longioribus complicatis, dorso subcarinato, apice truncato grosse argute 5-dentato; processu falcato ad apicem cuculli usque adnato ibique bifido, lobo dorsali minimo dentiformi, ventrali in cornu subulatum inflexum breviter exsertum producto. — W. Texas, on or near the San Pedro River, C. Wright, no. 1689, referred in Torr. Bot. Mex. Bound. 164, to a variety of *A. verticillata*. It is much more related to the appended Mexican species.

(A. COULTERI. Præcedenti affinis; foliis oppositis filiformibus; umbellis 3-6-floris; pedicellis filiformibus pedunculo subæquilongis; corollæ albæ lobis oblongis (lin. 3-4 longis); cucullis columna crassa triplo longioribus antheras æquantibus complicato-compressis subquadratis dorso carinatis centro solidis apice truncatis subintegris; processu lato-subulato falcato infra apicem cuculli libero integerrimo longius exserto. — Mexico, Coulter, coll. no. 983. Single specimen, in flower: fruit not seen. The horn of the hood springs from a solid central portion, which is winged dorsally by a keel; the ventral part and top bilamellar and open.)

lanceolatis apice crassiusculo recurvo intus puberulis basim versus penicillato-barbulatis: coronæ phyllis spathulato-oblongis planis crassi-

A. ANGUSTIFOLIA, Ell. Sk. i. 325, 1817. *A. tuberosa?* Walt. Car. fide Eil. *A. Michauxii*, Decaisne, l. c.: so named because a specimen in Michaux's herbarium is mixed with his *A. longifolia*; but Elliott's specific name has priority of all homonyms. The narrow and elongated thickish leaves are mainly alternate, which marks the species.

A. VIRIDULA, Chapm. Fl. 362. A well-marked species, with opposite and very narrow leaves, most resembling the following; but with smaller yellowish-green flowers, and hoods considerably exceeding the anthers and the horn.—Found only in the vicinity of Apalachicola, Florida.

3. Columna sub cucullis nulla: folia opposita.

A. CINEREA, Walt. Well distinguished by the few-flowered lax umbels, and short very obliquely dorsally truncate hoods, the ventral cusps of which surpass the broad-triangular horn.

δ. Corolla cum calyce rotato-patens, nunquam reflexa: crista mutica adnata in cucullo.

A. FEAYI, Chapman in litt. *A. cinereæ* subsimilis; foliis fere filiformibus longis patentissimis; umbellis terminalibus et subterminalibus brevi-pedunculatis paucifloris; corolla alba majuscula explanata; cucullis etiam albis præter costam petaloideis oblongis integris involuto-concavis antheris æquilongis sed patentibus intus dorso medio lamella semiovali integerrima instructis.—Tampa, Florida, Dr. Leavenworth (a single specimen in herb. Torr., collected 40 years ago), Dr. Wm. T. Feay, Dr. A. P. Garber. Dr. Chapman proposed to call this an *Acerates*, but in my view it is clearly an *Asclepias*.

§ 2. PODOSTEMMA. Cuculli stipitati, erecti, stipitibus antheras longe superantibus basibus columnæ adnatis, lamina spathulata intus cristata, crista inæqualiter bicorniculata: antherarum alæ medio latiores et subangulatæ.

A. LONGICORNU, Benth. *A. Lindheimeri*, Engelm. & Gray.—Ranges from Texas to Nicaragua. Follicles arrect on the deflexed pedicels.

§ 3. NOTHACERATES. Cuculli sessiles, oblongi, apice bidentati, intus crista angusta prorsus adnata e sinu corniculato-excurrente: antherarum alæ deorsum dilatatæ, supra basim late rotundatam auriculato-emarginatæ: polinia arcuato-obovata. Habitus *Aceratis auriculatæ*.

A. STENOPHYLLA. *Polyotus angustifolius*, Nutt. in Trans. Amer. Phil. Soc. v. 201. *Acerates angustifolia*, Decaisne in DC. l. c. Nuttall noted the clear transition to *Asclepias*.

ACERATES, EIL.

* Gynostemium subglobosum: columna sub cucullis brevibus manifesta: folia pleraque alterna.

A. AURICULATA, Engelm. in Bot. Mex. Bound. 160. Foliis prælongis angustissimis umbellis *Asclepiadi stenophyllæ* simillima; cucullis basi late auriculatis; antherarum alis angustis utrinque æquilatis.

usculis inappendiculatis basi corollæ et columnæ longiusculæ insertis corolla dimidio brevioribus; rostro stigmatis gracili integerrimo membranam antherarum erectam paullo superante. — *Metastelma? angustifolium*, Torr. Bot. Mex. Bound. 159. Ravine at Santa Cruz, Sonora, Mexico, very near the southern boundary of Arizona. Instead of constituting a new genus for this species, it is here referred to the extra-tropical South American genus *Melinia*, on account of the long and slender beak to the stigma, corolla-lobes distinctly but narrowly dextrorse-convolute, narrow sepals, &c. It is excluded from *Oxypetalum* by the absence of any tooth or appendage to the caudicles of the pollinia. The corona is attached rather more distinctly to the corolla than to the column, and the pieces are wholly distinct and rather widely separate; but a slight ridge at the base of each is decurrent into a slightly salient line on the column. The latter is about the length of the body of the anthers, which, again, bear a still longer erect membrane, ovate-oblong in form.

METASTELMA BLODGETTI. *Eumetastelma*: caulibus filiformibus; foliis parvis anguste lanceolatis; pedunculis 3-6-floris pedicellis (lineam longis) et petiolo brevioribus vel nullis; corollæ 5-partitæ lobis oblongo-lanceolatis intus sub apice penicillato-barbatis: coronæ

A. LONGIFOLIA, Ell. Columna paullo longiore; cucullis ovalibus integerrimis inappendiculatis marginibus ventralibus medio columnæ adnatis antheris dimidio brevioribus; antherarum alis semi-rhombeis basi magis attenuatis.

* * Gynostemium longius quam latum: cuculli oblongi parum breviores, basi bus columnam brevissimam tota longitudine obtegentibus: folia latiora sæpe opposita.

A. LANUGINOSA, Decaisne. Alæ antherarum paullo infra medium latiores subangulatæ.

A. VIRIDIFLORA, Ell. Alæ antherarum versus apicem latiores subangulatæ, basi longius angustatæ.

GOMPHOCARPUS, R. Br.

This genus is briefly defined as *Asclepias* without any crest or horn in the hoods. Except for two appended Californian species, which technically belong to it, it would be restricted to the Old World, mainly to Africa.

G. TOMENTOSUS, Gray, Bot. Calif. i. 477 (*Acerates tomentosa*, Torr.), has wholly the aspect and the structure of *Asclepias vestita*, of the same region, except as to the hoods, which are spreading or even depending, so that the quasi-bivalvular opening is superior or in appearance dorsal, giving a resemblance to the structure in the plant which I named *G. purpurascens*, but am now obliged to separate generically.

G. CORDIFOLIUS, Benth., except for the want of horn, would be an *Asclepias*, related to *A. phytolaccoides*.

squamis tenui-subulatis imæ basi corollæ insertis antheris cum columna brevioribus (sed manifesta) adæquantibus. — *M. parviflorum*, Chapm. Fl. 367, non R. Br. — Pine Key, S. Florida, Blodgett.

GONOLOBUS and LACHNOSTOMA. Later authors generally appear to have taken their idea of *Gonolobus* from those numerous tropical species which differ considerably from the typical ones of the Southern Atlantic States. The latter have not the colored-reticulated corolla of most of the tropical species, nor the broad and rounded lobes of many of them, nor the strongly salient-angled stigma, which has been made a part of the generic character, nor is the corona borne on the corolla, but either distinctly on the short staminal column or at its very base at the junction with the corolla. *Lachnostoma*, HBK., was founded on a single and peculiar species, with "corolla subhypocrateriformis," or at least with tube as long as the limb, and with "corona pentaphylla, fauci corollæ inserta, foliolis cuneatis carnosissimis apice lunato-bilobis," etc. Noting that the column of filaments is adnate to the tube of the corolla (as it truly is for the whole length), Kunth, indeed, adds the query: "An igitur corona summo tubo filamentorum nec fauci corollæ inserta?" But the flowers I have examined, from Fendler's no. 1050, show that the first view was the correct one. On separating the tube of the corolla from that of the filaments, almost without lesion, the coronal appendages are left on the former, to which they manifestly belong. There are, moreover, vestiges of a staminal corona, in the form of minute scale-like processes, one under the base of each anther. Decaisne adds three other species to the genus, and characterizes it by the "corona staminea gynostegio plus minusve adnata, pentaphylla." It will be allowed that, if the genus can stand upon the 5-phyllous corona, the mere insertion will be unimportant. But Mr. Bentham, enlarging the genus much more by adding Decaisne's *Ibatia* and *Chthamalia*, includes species with cup-shaped and with annular corona, thus resting *Lachnostoma* mainly on the insertion of this organ, which is variable from species to species, and really not different from that of typical species of *Gonolobus*. And our only reticulate-petaled species of the latter bears the annular corona distinctly on the column, close to its base, but wholly separate from the corolla. It thus appears, on the whole, that *Lachnostoma* should be restricted to the original *L. tigrinum*; and that *Chthamalia* (as the subjoined details show) should form only a subgenus of *Gonolobus*. Those reticulate-flowered tropical species (of which we have one, not very typical, representative in Texas), with all its variations in the gynostemium and corona, may form another section, which may

conveniently take the name of *Dictyolobus*, using here the Greek word in the sense of lobe, instead of pod.

The North American *Gonolobi*, of the Atlantic United States, are confused and difficult, partly because flower and fruit have seldom been had from the same plant. The subjoined conspectus gives the result of my study of the present available materials, aided by notes and sketches from Dr. Engelmann.*

* GONOLOBUS, Michx. Fl. i. 119.

§ 1. DICTYOLOBUS. Corolla rete subtili conspicuo sæpius colorato venosissima, nunc rugulosa; lobis plerumque latis. Flores in nostra parvuli, in pleris majusculi.

G. RETICULATUS, Engelm. Mss. *G. granulatus*, Torr. Bot. Mex. Bound. 165, non Scheele in Linnæa.—Texas and adjacent borders of Mexico. Well described (except as to anther-tips, which really overlie the edges of the stigma), but wrongly referred, by Dr. Torrey. Scheele's description of the peduncles as shorter than the petiole, the pedicels as barely equalling the flowers, and the lobes of the corolla as lanceolate-attenuate from a broader base, is incompatible with the present species, and relates to a variety of *G. levis*, Michx.

§ 2. EUGONOLOBUS. Corolla haud reticulata, lobis angustioribus: corona simplex, intus inappendiculata, columnæ basi sæpius inserta: stigmatis anguli parum prominuli: caules herbacei.

* Pedunculi pauci-pluriflori: corolla 5-partita, rotata, patentissima,

← Crassiuscula, viridula, extus cum calyce pedunculo brevi pedicellisque glabra: corona sub gynostemio pateriformis undulato-crenata, carnosæ: antheræ membrana tenuiter scariosa super marginem stigmatis inflexa: folliculi læves 5-angulati.

G. SUBEROSUS, R. Br. *Cynanchum*, L. Hort. Cliff. 79 (excl. syn. *Apocynum scandens fruticosum fungoso cortice Brasilianum*, Herm. Parad. 53), & Spec. 212, excl. syn. Gronov. *Periploca Carolinensis*, etc., Dill. Elth. 300, t. 229, f. 296. *G. macrophyllus*, Chapm. Fl. 368. Corolla in alabastro late conica, lobis ovato-triangularibus a basi sensim angustioribus acuminatis supra albido-hirsutulibus nunc glabratis.—Although Hermann's Brazilian plant, referred to, suggested the name, we may consider the Linnæan species as founded on the Dillenian plant, the figure of which very well represents what we take for this species. Moreover the Gronovian synonym belongs to *G. hirsutus* or *G. Carolinensis*. DeCaisne's *G. suberosus*, with ovate pubescent sepals, and corolla glabrous within, must be some quite other species.

G. LÆVIS, Michx. Fl. i. 119. Minus pilosus vel glabellus; umbellis 5-10-floris petiolo vix æquilongis: foliis oblongo-cordatis; corolla in alabastro elongato-conica, lobis lanceolatis seu lineari-lanceolatis glabris; folliculis lævibus 5-angulatis.—Mississippi to Arkansas and Texas. Pursh introduces some confusion by adding a wrong synonym, and a consequent misstatement of the color of the corolla. It passes freely into

GILIA (DACTYLOPHYLLUM) PARRYÆ. Pygmæa, floribunda, pubescens; caule e radice annua nunc vix semipollicari floribus brevior nunc demum bipollicari a basi confertim ramoso; foliis plerisque oppositis 5-7-partitis, segmentis acerosis (lin. 2-3 longis); floribus in dichotomiis subsessilibus; calyce profunde 5-fido corolla fere triplo brevior lobis lanceolato-subulatis, tubo brevissimo obconico; corolla aut alba aut sulphurea aut cæruleo-lilacina, tubo brevissimo cum

Var. **MACROPHYLLUS.** Foliis rotundato-cordatis majoribus (nunc 9-10-pollicaribus), acumine abrupto, lobis basilaribus rotundatis sinum sæpe claudentibus, pagina inferiore pube molli brevi nunc granulosa sæpius indutis; calycis lobis versus apicem rariter ciliolatis; folliculis brevibus angulatis 5-costatis. — *G. macrophyllus*, Michx. l. c. *G. viridiflorus*, Nutt. Gen. i. 163 (*G. Nuttallii*, Decaisne in DC.) *G. tiliaefolius*, Decaisne in DC. *G. granulatus*, Scheele in Linnæa, xxi. 759. *Vincetoxicum gonocarpus*, Walt. Car. 104, pro parte. — S. Carolina to Texas, Kentucky and Missouri. Elliott's *G. macrophyllus*, with muricate fruit and slender lobes to the corona, must be *G. Baldwinianus*, Chapman's is *G. suberosus*, and Decaisne's, in the Prodrômus, is mainly *G. obliquus*. Pursh's addition of "flowers dark purple or dirty yellow" was taken from Walter, who evidently had more than one species under his *Vincetoxicum gonocarpus*.

+ + Corolla submembranacea, purpurea, ochroleuca, vel albida: corona cupuliformis, gynostemio adæquans: membrana antherarum inconspicua vel obsoleta: pedunculi sæpius longiusculi pluriflori, cum calyce pedicellisque pubescentes: corolla extus pl. m. pubera: folliculi teretes muricati.

+ + Coronæ subcarnosæ margo tantum crenatus.

G. OBLIQUUS, R. Br. Corolla intus sanguineo-purpurea, extus viridula, lobis lineari-ligulatis: corona 10-crenulata, crenulis alternis angustioribus plerumque emarginatis vel bidenticulatis. — Roem. & Schult. Syst. vi. 64; Bart. Fl. Am. Sept. iii. t. 99; Gray, Man. ed. 5, 399. *G. hirsutus*, Nutt. Gen. i. 163, non Michx. *G. macrophyllus*, Decaisne, l. c., non Michx. *Gonolobium hirsutum*, Pursh, Fl. i. 179. *Cynanchum obliquum*, Jacq. Ic. Rar. t. 341. *C. discolor*, Sims, Bot. Mag. t. 1273. *C. hirtum*, L.? quoad *Apocynum scandens Virginianum*, etc., Moris. Hist. The most northern species, ranging from (Carolina?) the mountains of Virginia to Pennsylvania, Ohio, and Kentucky. — Var. **SHORTII**, apparently a form with larger (and dull purplish?) flowers, said to exhale the scent of *Calycanthus*-blossoms: known only in specimens collected by Short and Peter, near Lexington, Kentucky, where it should be re-discovered.

G. HIRSUTUS, Michx. l. c. Pedunculi pauciflori: corolla intus atro-purpurea, lobis elliptico-oblongis: corona margine obtuse æqualiter 10-crenata. — Virginia and Tennessee to Florida. The corolla in dried specimens by transmitted light shows a reticulate venation more distinctly than any other species of this group.

+ + Corona 5-lobata, dentibus geminatis vel bifidis interjectis: pedunculi pluriflori sublongiores.

G. CAROLINENSIS, R. Br. Corolla badia vel atro-purpurea, majuscula, lobis oblongis seu lineari-oblongis: corona subcarnosa, undulato-5-lobata, sinubus processu subulato bifido gynostemio adæquante instructis. — *Cynanchum Caroli-*

fauce obconico lobis obovatis integerrimis vel erosulis apice sæpius cuspidatis 2-4-plo brevioribus; antheris oblongis; capsula ovali-oblonga polysperma; seminibus angulatis fere cubicis, tegumento externo laxo tenui nec spirillifero nec mucilaginoso. — San Bernardino Co., S. E. California, on desert plains near the head of the Mohave River, Parry and Lemmon, also Palmer. A very distinct and pretty little species, in appearance somewhat intermediate between *G. dianthoides* and a

nense, Jacq. Ic. Rar. t. 342. This from the character should be Walter's *Vincetoxicum acanthocarpus*, Elliott's *G. Carolinensis* (excluding the fruit), and probably *G. hirsutus*, Sweet, Brit. Fl. Gard. t. 1. It extends from South Carolina to Louisiana and Arkansas.

G. BALDWINIANUS, Sweet. Corolla albida vel flavida, lobis oblongis demum subspathulatis tenuioribus: corona fere membranacea altius fissa, segmentis 5 latis sæpius emarginatis, 10 per paria interjectis lineari-subulatis duplo longioribus stigma superantibus. — *G. macrophyllus*, Ell., non Michx. *G. Carolinensis*, Nutt. Gen. i. 163, non R. Br. *G. hirsutus*, Lodd. Cab. t. 365? Georgia and Alabama to N. W. Arkansas. Elliott and Nuttall, who describe from dried specimens, speak of the corolla as "obscure yellow" or "yellowish," but Engelmann, who collected it in Arkansas, says "whitish"; and Buckley on the ticket of his specimens in the Torrey herbarium, collected in Alabama, writes "flowers white." This species clearly connects *Polystemma*, Decaisne, with *Eugonolobus*.

* * Flores solitarii subsessiles: antheræ etiam *Chthamaliæ*, sed corona simplex *Eugonolobi*.

G. SAGITTIFOLIUS. Humilis, volubilis, vix puberula; foliis subcarnosis parvis sagittatis, auriculis obtusis: corolla lutea glabra alte 5-fida, lobis lanceolato-linearibus: corona imæ basi corollæ inserta cyathiforma integerrima; folliculis lanceolatis lævibus. — Rio Limpio, W. Texas, Wright. This is Dr. Torrey's *G. parvifolius* only as respects the specimen of Wright referred to by him, and from which he described the follicle.

§ 3. *CHTHAMALIA*. (*Chthamalia* & *Lachnostomatis* spec. Decaisne.) Corolla haud reticulata, campanulata vel rotata, 5-loba vel 5-partita: corona intus cristata vel appendiculata, raro (appendicibus liberis) duplex: antheræ prominulæ a stigmate magis liberæ, marginibus nunc (*Asclepiadis* modo) alis corneis instructæ. Plantæ humiliores sæpius parviflores.

* Diffusæ, nec volubiles: pedunculi nulli: pedicelli 2-3 ad axillas fasciculati: folia cordata.

G. PUBIFLORUS, Engelm. Pl. Lindh. i. 44; Torr. Mex. Bound. 165. *G. prostratus*, Baldw. in Ell., non R. Br. *Chthamalia pubiflora*, Decaisne. — The only species of this section east of the Mississippi, and an ambiguous one. It has exactly the aspect of the two following, except that the campanulate corolla is cleft barely to the middle (in which it is very unlike true *Gonolobi*), but the cup-shaped crown, which overtops the stigma, is almost simple within, the five crests being attenuated and inconspicuous or even obsolete: there are five minute adnate auricles at the very base. The follicle, which I have not seen, is said to be smooth.

very dwarf *G. dichotoma*, desirable for cultivation on account of its abundant and variously colored flowers of comparatively large size for the pygmy growth, the corolla being fully half an inch long, indeed longer than the earlier stems. At the suggestion of Mr. Lemmon, this dainty plant is dedicated to Mrs. Dr. Parry, one of the botanical party who passed the last winter and spring in the San Bernardino district — making many interesting discoveries — and whose services to botany well merit this recognition.

G. BIFLORUS, Nutt. in herb. DC.; Torr. l. c. *Chthamalia biflora*, Decaisne. In this the corolla is rotate and deeply 5 cleft; the corona deeply lobed; and the canaliculate crest adnate to each lobe is connected at base with the column, while it terminates above in the stout and conspicuous thickened acumination which incurves over the edge of the stigma. The follicles, as in the next, are large and muricate. — Var. *WRIGHTII*, also from Eastern Texas, is a form with the corolla almost 5-parted into narrower lobes, and the cusps of the corona shorter.

G. CYNANCHOIDES, Engelm. Pl. Lindh. i. 43. has the inflorescence much inclined to be racemose-clustered on a peduncle-like summit of the stem, the upper leaves being reduced and bract-like, the corolla rotate-campanulate and almost 5-parted, and the very obtusely 5-lobed corona is appendaged within by a shorter crest which terminates in a free and blunt apex, shorter than the lobe to which it adheres.

** Caules humiles sed volubiles: flores (luteoli) subsessiles solitarii, raro gemini: folia parva, pl. m. hastata.

G. PARVIFOLIUS, Torr. l. c., excl. fruct. The corolla is globose in the bud, deeply 5-lobed, and almost rotate when expanded, the lobes ovate. The fleshy corona is at the very base of the short column; its lobes ovate, spreading, appendaged with a very broad adnate crest, the edge of which at base is united with the column, at the apex extended into a minute inflexed tooth.

G. HASTULATUS. *Lachnostoma hastulatum*, Gray, Bot. Calif. i. 620. In this the corolla is narrowly oblong in the bud, the lobes linear. The corona is of distinct pieces, like the hoods of *Asclepias*, and, as in that genus, borne at the summit of the column, close under the anthers; the ligule or horn within is prominently exerted and inflexed. Follicle rather slender and minutely muricate.

*** Caules elongati subvolubiles: pedunculi axillares folio sagittato-cordato breviores, umbellato 3-5-flori: corolla oblongo-campanulata, lurida, majuscula ($\frac{1}{2}$ pollicaris), alte 5-fida, lobis lineari-oblongis: corona cyathiformis, sub-lobata, intus lamellis 5 columnæ adnatis quasi septata.

G. PRODUCTUS, Torr. l. c. The follicles are ovate and smooth. The species ranges from Western Texas to Arizona, and into adjacent parts of Mexico.

**** Pedunculi filiformes folia mox longe superantes, quasi racemoso-pauci-flori: flores perpusilli: corolla rotata: corona alte laciniata, duplex: caulis humilis, a basi ramosissimus, nec volubilis.

GILIA (*LEPTOSIPHON*) *BREVICULA*. Inter *Tenuifloras* notabilis tubo corollæ (cæruleæ seu violaceæ) limbo parum sesquilingiore, foliis brevibus calyceque subglanduloso-hirtellis. — On the Mohave River, S. E. California, Dr. E. Palmer, 1876. — Stem barely a span high, more branching than in *G. androsacea*, which it much resembles; the branches becoming cymose. Leaves only 3 lines long; the divisions acerose-subulate, the pubescence short-hirsute and glandular. Tube of the corolla barely 5 lines long, nearly double the length of the calyx and bracts; the oval lobes fully 3 lines long. Stamens exerted from the very short cyathiform throat. Style exerted: stigmas long and slender, almost capillary, fully equalling the lobes of the corolla. The latter appears to have been blue, or violet-purple. The flowers are abundant, and the species would be attractive in cultivation.

GILIA (*IPOMOPSIS*) *HAYDENI*. *G. subnudæ* affinis, ramosior, fere glabra; ramulis pedunculis (corymbosis longioribus) calycibusque

G. PARVIFLORUS. *Lachnostoma? parviflorum*, Torr. l. c. This remarkable species closes the series. Its principal corona is somewhat like that of *G. Baldwinianus*, which is a genuine *Gonolobus*. It is divided into five short and broad membranaceous lobes, which from the apex are produced into a pair of slender subulate processes, with a wide sinus between: opposite each lobe within, and separately inserted, is a similar and longer process, which may answer to the ligule or other internal appendage of the foregoing species, become wholly free. The follicle is ovate and tuberculate-muricate.

(*G. PROSTRATUS*, R. Br., the *Lachnostoma prostratum* of Decaisne, is also a *Chthamalia*, with lobes of the corona nearly distinct, each produced into a pair of processes like those of the preceding, but also with a shorter intermediate one, and still another before this, the latter answering to the internal ligule adnate up to the notch of the lobe.)

To *Ptycanthera* — a little known genus, well referred by Bentham (who had not seen specimens) to the *Gonolobææ*, and marked by the direct adhesion of the corona-lobes by the whole length of the middle of the inner face to the column — there are two Cuban species to add, both with flat-topped stigma: viz.,—

PTYCANTHERA ACUMINATA = *Orthosia acuminata*, Griseb. Cat. Pl. Cubens. 175. In this the lobes of the deeply 5-parted corona are ovate-oblong, attached along the middle only to the whole length of the column, the sinuses rounded and open. Pollinia obliquely short-pyriform, pellucid at the insertion of the caudicle.

PTYCANTHERA OBLONGATA = *Orthosia oblongata*, Griseb. l. c. Lobes of the disk oblatly oval and emarginate, with thinner free edges, the centre adnate to the whole length of the column, which is considerably shorter than in the preceding species, the sinuses somewhat auriculate. Pollinia nearly oblong, strongly arcuate.

præsertim glandulosis; foliis radicalibus pinnatifidis, caulinis parvis brevibus linearibus integerrimis; corolla tubuloso-infundibuliformi gracili ($\frac{1}{2}$ - $\frac{3}{4}$ -pollicari) læte rosea, tubo lobis obovatis 3-4-plo longiore; antheris subsessilibus fauci insertis; stigmatibus brevissimis; ovarii loculis 6-ovulatis 2-3-spermis; seminibus oblongis, testa tenui sub aqua nec spirillifera nec mucilaginosa. — High plains of the San Juan, S. W. Colorado or adjacent part of Utah, Brandegee, in Hayden's Exped. 1875.

GILIA (*IPOMOPSIS*?) *CÆSPITOSA*. Glanduloso-puberula, viscida; caulibus brevissimis e caudice multicipite cæspitante pedunculis ramisve floridis nudiusculis (2-3-pollicaribus) laxè 3-5-floris terminatis; foliis radicalibus confertis crassiusculis spathulatis vel spathulato-lanceolatis (imis lin. 2-3 longis) obtusissimis, sequentibus longioribus mucronatis, pedunculorum ad bracteas subulatas diminutis; pedicellis fere nudis; calycis angusti lobis subulato-setaceis; ovulis in loculis paucis. — Rabbit Valley, Utah, on barren cliffs of sandstone, at 7,000 feet, L. F. Ward, in Powell's Expedition, 1875. The corollas gone, and fruit not formed; but the plant cannot belong to any already published species.

PHACELIA (*EUTOCA*) *GRISEA*. Annuæ, cinereo-pubescentis et hirsutæ, viscidulæ: caule ultra-spithamæo a basi ramoso; ramis patentibus sat validis, hirsutia patentissima rigidula, pube brevissima densa; foliis ovatis oblongisque integerrimis (semipollicaribus ad pollicaria) brevipetiolatis cinereo-strigosis; spicis elongatis densifloris; calycibus subsessilibus, sepalis spathulatis patienti-hispidis corolla (alba?) subdimidio brevioribus capsulam ovatam acutam paullo superantibus; filamentis longe exsertis pilis brevibus papillisve retrorsis hirsutulis basi plicis transversis adnatis appendiculatis; ovulis 10-12; seminibus 5-6 grosse rugoso-favosis. — On Pine Mountain, back of San Simeon Bay, California, Palmer.

ERITRICHIMUM *SETOSISSIMUM*. *Krynitzkya* inter subsect. *Pseudomyosotidem* et *Pterygium*, habitu potius *E. glomerati*, cinereo-pubescentis, hirsutulæ, et setis urentibus hispidissimæ; caule valido ultra-bipedali e radice ut videtur bienni; foliis spathulatis seu lanceolatis; spicis racemoso-paniculatis paucis et parvis bracteatis, fructiferis elongatis strictis (4-pollicaribus); corolla alba parva (lin. 2-3 longa), tubo lobis rotundatis vix duplo longiore intus versus basin 10-dentato-annulato, fauce insigniter 5-fornicata; antheris brevi-oblongis; nuculis pro genere magnis ala integerrima circumdatis (cum ala ovata lin. 2-3 longis) opacis scabriusculis, facie dorsali parum convexis, ventrali angulo obtusissimo per sulcum angustissimum gynobasi subuliformi æquilongæ

affixa. — Shores of Fish Lake, Utah, at 8,700 feet, L. F. Ward, in Powell's Expedition, 1875. A most remarkable species, which, without the fruit, might be confounded with *E. glomeratum*.

ERITRICHIMUM HOLOPTERUM. *Krynitzkia*, facie *E. leiocarpi* et *E. muriculati* formæ validioris; corolla fauce fornicibus conspicuis basi tubi appendicibus parvulis instructis: nuculis omnibus ala angusta integerrima circumdatis dorso muricatis. — S. Utah, Capt. F. M. Bishop; Ehrenberg, Arizona, Palmer.

PECTOCARYA (GRUVELIA) PUSILLA. — *Gruvelia pusilla*, A. DC. Prodr. x. 118. That most successful plant-finder, Rev. E. L. Greene, sends this Chilian species from the vicinity of Yreka, in the northern part of California, east of the Coast Range mountains, therefore far from the coast. It there abounds in company with the natives of the region, and, as Mr. Greene states, would not be suspected to be other than indigenous.

PECTOCARYA (GRUVELIA) SETOSA. A præcedente distinctissima foliis etc. hispidis; calyce setis paucis validis divaricatis horrido; nuculis majoribus ala latiuscula nunc undulata marginatis undique uncinato-setulosis. — S. E. California, on the desert plains of the upper Mohave River, Palmer.

LYCIUM GRACILIPES. Viscidulo-puberulum; foliis crassiusculis spathulatis seu oblongo-obovatis (lin. 2-6 longis): pedicellis puberoglandulosis folia floralia longius superantibus flori subæquilongis: calyce campanulato breviter 5-dentato; corolla infundibuliformi "violacea nunc albescente" semipollicari, tubo proprio calycem vix superante, fauce sensim ampliata, lobis 5 lato-ovatis obtusissimis lineam longis; filamentis filiformibus fauci versus basim insertis inferne villosulis; antheris subinclusis. — Northern Arizona, at Williams Fork (alias Bill Williams' River), Palmer, 1876.

ANTIRRHINUM (PSEUDORONTIUM*) CHYTROSPERMUM. Calycis segmentis oblongo-lanceolatis tubo corollæ æquilongis; cyatho seminis maximo ollæformi. — Ehrenberg, Arizona, Palmer.

PENTSTEMON COMARRHENUS. *Speciosi*: gracilis, glaucescens, glaber vel foliis (summis linearibus, imis oblongis ovalibusque) minutissime

* **ANTIRRHINUM** sect. **PSEUDORONTIUM.** Capsula tenui-chartacea subdudyma, loculis æqualibus apice irregulariter rumpentibus *Asarinæ*. Semina ala pelviformi modo *Orontii*. — Spec. 2, Am. Bor.-Occ. Merid.; foliis alternis petiolatis ovatis integerrimis; caule erecto; pube viscidula; floribus parvis. **A. CYATHIFERUM**, Benth., ex tab. & descr. calycis segmentis lineari-lanceolatis tubo corollæ multo brevioribus, cyatho seminis majusculo; & **A. CHYTROSPERMUM** supra.

pruinoso-puberulis; panicula virgata laxa; pedunculis pedicellisque longiusculis; sepalis ovalibus parvis (haud ultra lin. 2 longis); corolla (pollicari) cæruleo-purpurea, tubo inferne longius attenuato; antheris longissime lanatis. — Common in Utah, especially southward, coll. by Gordon, E. W. Emerson, Mrs. Thompson, Siler, and recently by L. F. Ward. Like *P. secundiflorus*; but flowers larger, looser and hardly secund in the panicle; and the anthers long-woolly almost in the manner of *P. Menziesii*. Still nearer, perhaps, to the less-known *P. strictus*, Benth.; but that has much smaller and narrower flowers in a crowded inflorescence, acuminate sepals, &c.

PENTSTEMON WARDI. *Speciosi*: crebre cæsio-puberulus; caule subpedali; corollis extus pallidis; antheræ glabræ oculis subcartilagineis basi acutis apicibus contiguus longiuscule inapertis: cæt. *P. glabri*. — Utah, near Glenwood, at 5,300 feet, L. F. Ward, in Powell's Expedition, 1874.

MIMULUS PALMERI. *Eumimulus*: viscidulus sed fere glaber, spithamæus e radice annua, paniculato-ramosus; foliis sessilibus integerrimis, imis spathulato-oblongis, superioribus linearibus; pedunculis filiformibus folium bis superantibus: calyce haud obliquo, dentibus æqualibus latis obtusissimis; corolla ($\frac{3}{4}$ poll. longa) more *Eunani* infundibuliformi sanguineo-purpurea calyce triplo longiore, lobis brevibus subæqualibus. — S. E. California, on the Mohave River, Palmer. A truly handsome species, well worthy of cultivation.

ORTHOCARPUS LASIORHYNCHUS. *O. lacero* proximus; pube molliore; floribus majoribus; corollæ læte aureæ saccis amplioribus galea tenuiter subulata dense albo-villosa superatis. — Mohave River, S. E. California, Palmer, 1876.

MONARDELLA PALMERI. Nana, rhizomatibus stoloniformibus perennans; capitulis corollisque *M. odoratissimæ*; caulibus vix spithamæis parum puberulis; foliis confertis oblongo-linearibus lanceolatisve obtusissimis parvulis crassiusculis viridibus fere glabris, venis glandulisque punctiformibus obsoletis; bracteis rubescentibus oblongis subhirsutis ciliatis; dentibus calycis lanceolatis acutis intus marginibusque parce hispidis. — Redwood forests on Sta. Lucia Mountains, California, Palmer.

STACHYS ROTHROCKII. Spithamæa, a basi ramosa, villosa-lanata; radice ut videtur perenni; foliis omnibus sessilibus lanceolatis obtusiusculis subintegerrimis (pollicaribus), floralibus superioribus flores haud superantibus; verticillastris sæpius trifloris spicato-confertis; calyce sessili subcampanulato, dentibus subovatis muticis; corollæ (lin. 4-5 longæ) tubo incluso, galea saltem extus albo-villosa. — Zuni Village,

New Mexico, Dr. J. T. Rothrock, in Wheeler's Expedition, 1874. In aspect considerably unlike any other North American species: apparently indigenous.

ERIOGONUM GREENEI. *Heterosepala* inter *E. proliferum* et *E. ovalifolium*: majusculum; foliis oblongis acutiusculis; scapo ultraspathamæo sub involucrio primario sessili 3-radiato, radiis elongatis involucria 1-3 turbinata (lin. 3 longa) gerentibus quandoque proliferis; perigonio albo (lin. 3 longo), segmentis exterioribus ovalibus basi cordulatis per costam viridulam interioribus angustioribus haud emarginatis longius adnatis. — Northern California, on rocky hills about Yreka, E. L. Greene. An interesting accession to the *Heterosepala* section.

OXYTHECA TRILOBATA. Cymoso-ramosa; foliis radicalibus bracteisque fere *O. Watsoni*; involucris longius pedunculatis pro genere maximis alte 5-partitis nunc hinc divisis, phyllis patentibus foliaceis oblongo-lanceolatis costa valida excurrente aristatis; perigonii sepalis ligulato-oblongis superne trifidis, lobis ovato-lanceolatis erosulis acuminatis. — San Bernardino Co., S. E. California, Lemmon and Parry.

CHLORÆA AUSTINÆ. Planta alba aphylla; radicibus carnosofibrosis; caulibus fasciculatis (subpedalibus) laxè vaginatis; spica oblonga laxiuscula; floribus pro genere parvis albidis (perianthio parum semipollicari); labello trilobo, lobo medio integerrimo transverse oblongo; anthera modo *Cephalantheræ* substipitata. — Banks of a wooded ravine in the Sierra Nevada, California, near Quincy, in Plumas Co., Mrs. R. M. Austin; — whose zeal and services to botany, and notably her observations upon the habits of *Darlingtonia*, render it particularly proper that this remarkable plant of her own discovery should commemorate her name. I refer it to the South American genus *Chloræa*, rather than to the European and North Asian *Cephalanthera*, on account of its habit, and because there is no articulation between epichilium and hypochilium.

POSTSCRIPT.

SAXIFRAGA CHRYSANTHA. *S. Hirculo* et *serpyllifoliæ* affinis: caudiculis perennantibus cæspitosis diapensioideo-foliatis cum stolonibus filiformibus; foliis spathulatis seu lineari-spathulatis obtusissimis nitidulis glabris (lin. 2-3 longis) basi sensim angustatis sessilibus, caudiculorum crebre rosulato-imbricatis; caulibus floriferis scapiformibus fere bipollicaribus 1-4-foliatis 1-2-floris glabris vel superne cum

calyce reflexo glanduloso-hirsutulis; petalis ovalibus læte aureis basi ecallosis supra unguem truncatis vel subcordatis; ovario et capsula late ovatis apice breviter bilobis; seminibus oblongis striolatis nitidis. — *S. Hirculus*, Gray in Am. Jour. Sci. xxxiii. 409 (coll. Parry, no. 164 & 166), non L. *S. serpyllifolia*, Gray in Proc. Acad. Philad. 1863, 62 (coll. Hall & Harbour, no. 199), non Pursh. High alpine region of the Colorado Rocky Mountains, especially abundant on Torrey's and Gray's Peaks, at 11–14,000 feet, its golden flowers close to the sward, more brilliant than those of the equally abundant *Geum Rossii* which accompanies it. *S. Hirculus* occurs at very much less elevation, fully resembling the Arctic American and the European plant. *S. serpyllifolia*, Pursh, now better known by good Alaskan specimens, collected by Prof. Harrington in 1871–2, is more slender, the flowers solitary and smaller, the calyx not reflexed even in fruit, petals light yellow, cells of the anther parallel, ovary partly immersed in a disk, its base adnate to the base of the calyx, the capsule distinctly 2-horned at the summit, and the tip of the horns narrow and styliform. These distinctions were made out several years ago, and the Rocky Mountain species has been freely distributed among botanists under the name of *S. chrysantha*, but it has accidentally escaped publication.