ART. XVII.—*Contributions from the Gray Herbarium of Harvard University, New Series, No. IX;* by B. L. ROBINSON and J. M. GREENMAN.

I. *On the Flora of the Galápagos Islands, as shown by the collection of Dr. G. Baur.*

WHILE exploring the Galápagos Archipelago in the summer of 1891, Dr. George Baur secured, besides zoölogical specimens, a large collection of plants. The latter have recently been determined at the Gray Herbarium and for various reasons possess considerable interest. They furnish in several cases more copious material of hitherto imperfectly known forms and, as is to be expected, contain a certain number of new species. Furthermore Dr. Baur visited not only all the islands hitherto explored but extended his collecting to no less than eight others, from which, so far as can be learned, no plants have been secured, or at least reported. It is well known not only that the archipelago possesses a peculiar and remarkable vegetation, but that the different islands exhibit in their floras a striking individuality. It has been accordingly a matter of interest to compare the forms of the newly explored islands with those of the others for some time known through the collections of Darwin, Edmonstone, Macræ, Douglas, Scouler, Andersson and Agassiz.

While upon some of the smaller islands Dr. Baur collected only a few species, enough material is at hand not merely to confirm strongly the view that almost every island has its peculiar species and varieties, but to show clearly that even plants, which must pass as the same species, often exhibit, when found upon several islands, more or less striking racial differences. These facts, while in other respects noteworthy, derive a special interest from their relation to the probable origin of the flora of the group. Regarding the fauna Dr. Baur has in several recent articles called attention to peculiar harmonic relations existing between the forms of the different islands, and has argued from zoölogical grounds that the islands must at one time have been united, not only with each other but with the mainland near Central America. This view has been severely criticised by several writers, but no one has attempted to account for the peculiar distribution of differing, yet closely related forms upon the islands, and as the subject is one which merits further attention, it seems worth while to present the botanical data in some detail.

Perhaps no species to be found upon the different islands better illustrates the noteworthy racial divergence in related

forms than *Euphorbia viminea* Hook. fil. This species differs markedly in foliage from any other known member of this large genus, and is characteristic of the Galápagos Archipelago. Being essentially a desert plant, it can subsist even upon those islands of the group which are of low altitude and do not attain the upper regions of moister atmosphere. It was first collected by Macræ upon Albemarle, rediscovered by Andersson on Charles Island, and has now been collected by Dr. Baur upon the following islands: Barrington, Chatham, Southern and Eastern Albemarle, James, Jervis, Bindloe, Tower, and Abingdon. Even the most cursory inspection of the forms from these different islands discloses marked variation in the contour, size, thickness, rigidity, and color of the leaves, as well as in the length of the internodes, color of the stems, etc., while more careful examination shows that these are not mere individual differences, due to chance, state of development, or individual environment, but each form appears in general to be restricted to a single island. Some forms, such as those of Abingdon and Tower Islands, differ rather strikingly from the rest, while others present slighter differences; in a few cases so slight, that a series of careful measurements is necessary to demonstrate their existence. But the examination of a considerable number of specimens, such as those secured by Dr. Baur, shows that the species, as it occurs upon each island, differs in some characteristics, slight or more considerable, from the forms of all or nearly all of the other islands, and furthermore each island appears to have *only one* form of its own.

The question at once presents itself, if this archipelago is composed of islands of elevation, built up from the sea-floor independently by volcanic action, how has such a distribution been effected. If the vegetation has been derived from the mainland by the chance transportation of seeds, it is quite impossible to believe that each island has received a slightly different form of the same species, and we are forced to the much more natural assumption that racial and varietal divergence has come about after the introduction of the species upon the islands. Now, continuing the supposition that these are islands of elevation, the seeds of *Euphorbia viminea* must have reached them in one of two ways; either each of the nine islands, where we know the species now to occur, must have received its seed directly from the mainland or, what is much more natural, seed must have reached one or more of the islands and from these spread to the rest. That the same species should have reached all these islands presupposes a considerable facility of transportation. But as soon as this is granted it is impossible to understand the highly individual development of the forms upon the different islands. For rel-

ative or complete isolation seems necessary to account for the racially divergent floras of the islands; and especially for the occurrence of only one form upon each island. It would thus appear necessary, in accounting for the present distribution, to assume that at one time in the remote past the islands were either united, or at least that the channels which separate them were less formidable barriers to seed-transportation than at present, so that a general distribution of species could have been effected; and that subsequently, as the islands separated, or as the channels through some change of currents, or other cause, became less easily passed, an era of *much* greater isolation of the floras of the different islands came about. The divergence of character of the vegetation would then begin at once and the otherwise unaccountable existence of a single and peculiar form upon each island would be readily intelligible.

While not prepared to make any positive assertion regarding the probable origin of the islands, the authors fail to see in the hitherto generally accepted theory of elevation any satisfactory explanation for the harmonic yet divergent floras of the different members of the group. Upon Dr. Baur's assumption of a former union between the islands, and subsequent separation by subsidence, not only is explanation possible, but the existing flora of the archipelago is just that which would most naturally result from such an origin. A former union of the islands would account at once for the occurrence of identical ancestral species upon the different members of the group, and the subsequent separation give the needed isolation for varietal and racial divergence, while the latter could not have come about if a continual interchange of seed were taking place from island to island.

Regarding a former land-connection with the continent, which would certainly offer much greater geological difficulties, the botanical evidence is still too vague to merit regard. The affinities of the vegetation of the upper, moister portions of the islands are doubtless, as has been assumed, with the floras of Columbia, Central America, Southern Mexico, and the West Indies, while much of the desert flora of the lower regions has doubtless been derived from the arid regions of Chili and Peru. But so far as botanical data are concerned this could have come about either by migration by land or by transportation by oceanic currents and, as the latter still exist, it seems unnecessary to assume the former. However, upon this point the evidence from the vegetation appears to be still wholly indecisive.

The harmonic relation of the floras of the different islands, which, as we have seen, appears to have such an interesting bearing upon the former possible connection of the islands

with each other, is shown not only by *Euphorbia viminea*, but by various other endemic species and groups of species of the same and other genera and orders.

All the Galapageian species of *Euphorbia* for instance, with the exception of *E. amplexicaulis* Hook. fil., form a closely related group, doubtless having a comparatively recent common ancestry; but most of these forms are characteristic of particular islands. The same is eminently true of the different species of *Acalypha*. The *Borreriæ* of the Galápagos Islands also form, for the most part, a close group of very nearly related species, or perhaps better, varieties of one polymorphous species, all of which have probably diverged from a uniform parent stock after the separation of the insular floras from that of the mainland and from each other. Here, however, we find in some instances the same form upon two or more of the islands, as though transportation of the seed had offered somewhat less difficulties than in the case of *Euphorbia viminea*. The peculiar interest which attaches to the individual occurrence of these nearly related forms of various groups upon the different islands, certainly warrants the publication of the following more detailed descriptions and complete list of Dr. Baur's plants.

The forms of *Euphorbia viminea* Hook. fil. are as follows:

Forma ALBEMARLENSIS (typica). Internodes 4 to 5½ lines long: leaves of the stem and of the slender elongated branches 2 to 5½ lines long, half line broad, reddish in the dried state and usually paler beneath, linear with dilated rounded rarely retuse tip; margins except near the apex strongly revolute; leaves of the fascicles and scarcely developed branchlets similar but only 1 to 2 lines long and more distinctly retuse at the apex.—Albemarle Island; collected first by Macræ, and again by Dr. Baur on the southern end of the island in July, and on the eastern side in August, 1891.

Forma JACOBENSIS. Internodes 3 to nearly 6 lines long: leaves of the stems and branches 3 to 6 lines long, half a line broad, scarcely dilated at the apex; fascicled leaves as in the preceding. —Collected by Dr. Baur near Orchilla Bay, James Island, 1891. Distinguished from the last by its slightly longer and less dilated leaves.

Forma CASTELLANA. Internodes 2½ to 4 lines long: leaves of stem and branches 3 to 4 lines long, three-fourths lines broad; a line in width at the dilated apex, truncate and retuse, much firmer and thicker than in any of the other forms, very pale above, whitened beneath; fascicled leaves very short, 1 to 1½ lines long. —Collected on Tower Island, by Dr. Baur, September, 1891.

Forma CHATHAMENSIS. Internodes from 3 to 5½ lines long: leaves of the stem and branches 4½ to 7 lines long, half line broad, slightly dilated at the truncate or often retuse tip, pale in the

dried state; fascicled leaves numerous, 1½ to 3 lines long, retuse.—Collected on Chatham Island, lower region, southwest end, by Dr. Baur, June, 1891.

Forma CAROLENSIS. Internodes from 3 to 5 lines long: leaves of the stem and branches 5 to 10½ lines long, narrowly linear, not at all dilated but merely rounded at the tip, more slender petioled than the preceding forms.—Collected on Charles Island, by Andersson, 1852.

Forma BARRINGTONENSIS. Closely approximating forma *Albemarlensis* but having leaves commonly longer, 6 to 12 lines in length.—Collected on Barrington Island, by Dr. Baur, July, 1891. Essentially the same form, although much paler, in the dried state, was collected on Bindloe Island by Dr. Baur, September, 1891.

Forma JERVENSIS. Internodes 3½ to 6 lines long: leaves of the stems and branches narrowly linear, slightly dilated at the tip, 8 to 13 lines long, half a line broad; the fascicled leaves few and much shorter.—Collected on Jervis Island, by Dr. Baur, 1891. Chiefly distinguished from the other forms by its long narrow leaves, which in the dried state are very pale.

Var. ABINGDONENSIS. Internodes from 5 to 10 lines long: leaves of stem and branches 10 to 15 lines long, linear spatulate, very gradually dilated, half a line broad near the base, 1¾ lines broad toward the rounded and indistinctly apiculate apex, pale above, whitened beneath.—Collected on Abingdon Island, by Dr. Baur, 1891. This form is so well-marked as to merit varietal rank.

In specimens of *Euphorbia articulata* Ands., collected on Charles, James, Albemarle and Bindloe Islands, no satisfactory formal or racial differences could be detected. The Acalyphas, with the exception of the new *A. Baurii*, belong to a small group of closely related forms, regarded by Andersson as species; but by Müller Arg. these so-called species are reduced to six varieties of *A. parvula* Hook. fil. From accounts of previous collectors and from numerous specimens in Dr. Baur's collection, it appears that none of these species, as distinguished by Andersson, have a general distribution; while *A. reniformis* Ands., *A. diffusa* Ands., and the typical *A. parvula* Hook. fil. are each confined to a single island. The other species in essentially the same form occur upon two or more islands.

In *Amarantus sclerantoides* Ands. a racial variation has been noted similar to that in *Euphorbia viminea*. The type of the former was collected on Charles Island by Andersson and has narrow linear leaves 3½ to 8 lines long, scarcely a line broad, somewhat dilated at the apex. Two forms collected by Dr. Baur upon Chatham and Hood Islands differ perceptibly in foliage as follows:—

Forma CHATHAMENSIS. Leaves shorter and broader at the tip, 2½ to 5 lines long, a little over a line broad at the apex.—Collected on Chatham Island, lower region, southwest end, June, 1891.

Forma HOODENSIS. Somewhat nearer to the above form than to the type but with leaves less dilated at the tip.—Collected on Hood Island, July, 1891.

Besides the forms mentioned, Dr. Baur's collection contains the following new or otherwise noteworthy species:

HYDROCOTYLE UMBELLATA L. A form apparently of this species was collected in the upper region of Chatham Island at the southwest end, June, 1891. It differs from the typical form only in its shallowly repand dentate rather than crenate leaves.

BORRERIA BAURII. Slender, ascending: stems weak, a foot or so long, branched, terete, slightly woody at base, covered with a grayish cortex below; branches ascending, finely puberulent or nearly glabrous, 4-angled; internodes much exceeding the leaves: the latter sessile, spreading, ovate to ovate-lanceolate, acute, hispid-ciliate on the revolute margins, slightly scabrous or quite smooth above, paler and almost or quite glabrous beneath, 2½ to 3½ lines long, ¾ to 1½ lines broad, acutish and with short pungent mucronation: flowers minute, 3 or 4 in each of the axils of the upper leaves: calyx teeth ovate, acute, hispidulous, erect in fruit, a little exceeded by the corolla: lobes of the latter recurved: throat pubescent: fruit hispidulous: seeds black, strongly concavo-convex, finely pitted, shallowly and longitudinally channeled upon the dorsal surface.—Collected in the lower region of Chatham Island at the southwest end, June, 1891. Most nearly related to *B. ovalis* Ands.

BORRERIA GALAPAGEIA. Stems slender, ligneous, covered with roughish fuscous cortex; branches approximate, ascending, densely pubescent, leafy; internodes short but usually exceeding the leaves: the latter ovate-oblong, 2 to 3 lines in length, 1 to 1½ lines in breadth, with smaller ones fascicled in the axils, obtuse, covered upon both surfaces with dense grayish and somewhat scabrous pubescence; margins strongly revolute; midrib prominent beneath: flowers about 2 in each of the upper axils: calyx-lobes erect, acute, about equalling the corolla, rough-pubescent as is also the fruit.—Collected on Duncan Island, August, 1891. Apparently nearest *B. divaricata* Hook. fil.

BORRERIA PACIFICA. Fruticose: stem terete, ligneous, covered with smoothish grayish brown cortex; branches many, elongated, ascending or widely spreading, mostly simple, with a close fuscous and scabrous puberulence, especially upon the four salient angles; internodes usually considerably exceeding the leaves: the leaves oblong-lanceolate, sessile, acute, mucronate, scabrous above, glabrous or nearly so beneath, 3½–6 (–8) lines long, scarcely a third as broad, and with smaller leaves fascicled in the axils; margins revolute; midrib prominent beneath; stipular sheaths with about 5 setaceous teeth upon each side: flowers 2 or 3

together in the axils: calyx-lobes lanceolate, acute, mucronate, 1 to 1½ lines long, about equalling the corolla: fruit with scattered grayish pubescence.—Collected on Indefatigable Island, south of Conway Bay, August, 1891.

The three species of *Borreria* here described were distributed as *Spermacoce Baurii*, *S. Galapageia*, and *S. Pacifica*, respectively.

ERIGERON TENUIFOLIUS Hook. fil.? Specimens corresponding in most essential characters with Hooker's description (Enum. Pl. Galap., Trans. Linn. Soc. xx, 207), were secured on South Albemarle Island, July, 1891. The leaves, however, are 1½ to 3 inches long and ¾ to 1 line broad, being accordingly nearly twice as large as in the type. Furthermore the tubes of the disk flowers are glabrous. Without a comparison with the type it is impossible to say whether the present plant is identical with it or represents a species new at least to the islands.

An interesting but unfortunately sterile plant collected on Charles Island, is identical with the specimen of Andersson upon which it appears that Steetz based his description of *E. tenuifolius* in Andersson's Om Galapagos-öarnes Veg. 68. It is to be regretted that the present specimens are too imperfect to show the true position of this problematic plant, although they show pretty clearly that it is distinct from Hooker's species.

ACANTHOSPERMUM LECOCARPOIDES. Pubescent throughout and probably viscid: leaves ovate-oblong, irregularly laciniate or shallowly pinnatifid, with obtusely toothed segments, rounded sinuses, and tapering base, slender-petioled, 2 to 4 inches long: peduncles solitary in the forks, slender, 2 inches long: heads three-fourths inch or more in breadth; outer involucral scales about 4, ovate, acuminate, serrate or entire, 3 or 4 lines long, pubescent upon both surfaces; rays yellow, about 5, elliptic-oblong, minutely 3-toothed at apex: fruit (achene invested in inner bract) irregularly turbinate, somewhat compressed laterally, and developed dorsally, finely and densely pubescent and bearing near the summit 4 or 5 slender spreading straight or somewhat hooked spines: style with slender and spirally recurved branches: disk-flowers about 30, glabrous, with filiform empty achene, slender tube, ampliate throat, and 5-cleft limb: style filiform, entire: anthers subsagittate at base: chaff 1½ lines long, irregularly fringe-toothed at apex: disk conical.—Collected on Hood Island, July, 1891; said to be rare, at least upon this island. Although possessing all the important technical characters of the genus, this plant has more numerous disk-flowers than any hitherto known species. Both in this regard and in its outer involucre and foliage it bears a strong resemblance to *Lecocarpus*, a genus peculiar to the Galápagos Archipelago, doubtless nearly related, but with a very different and characteristic fruit.

SCALESIA BAURII. Villous-pubescent: leaves pinnatisect to the middle, ovate in outline, acute, attenuate at the base, resinous-dotted, finely pubescent and slightly scabrous above, pubescent

and somewhat villous upon the midrib beneath, 3 or 4 inches long, half as broad; segments about 7 pairs, irregularly toothed or again somewhat pinnatifid; petioles slender, about an inch long: peduncle solitary, slender, 1½ inches or more in length: head half inch or more broad; involucre campanulate: scales ovate, acutish, strongly pubescent on both surfaces: true ligulate flowers none, the marginal disk-flowers bilabiate and ray-like, bisexual; the others regular, 5-parted, pubescent on the outer surface of the tube: scales of the disk unequally 3-parted and strongly striate.—Collected on Duncan Island, August, 1891. Apparently near *S. incisa* Hook. fil., but differing from the description of that species in its slender peduncle and ovate acutish involucral scales.

ACNISTUS sp. Arborescent shrub: branchlets glabrous, covered with grayish bark, leaf-bearing at their ends: leaves obovate-elliptic, entire, rounded at the apex, 2 to 4 inches long, 1 to 1½ inches broad, attenuate at the base to slender petioles (half inch long), thin, bright green, puberulent and finely punctate above, paler and soft pubescent beneath: pedicels axillary, rather few in a fascicle, filiform,somewhat thickened toward their ends, spreading or pendulous, nearly an inch in length: calyx broadly cup-shaped, about 2 lines long and broad; the limb subentire: corolla funnel-shaped, about an inch long, externally pubescent; throat gradually ampliate; limb 5-lobed; lobes ovate, obtusish, ciliated: stamens inserted a little below the middle of the tube, included: stigma obscurely 2-lobed.—Collected on Chatham Island, June, 1891. Apparently near *A. ellipticus* Hook. fil., but differing in its pubescent leaves and in having a corolla about twice as long as described for that species.

SOLANACEA sp. Densely pubescent herb with habit, inflorescence, and foliage of *Datura:* leaves broadly ovate (in some cases broader than long), open cordate, shallowly sinuate-toothed, 2 to 3 inches in diameter, above green, glabrous or nearly so, under lens finely papillose-punctate, below pubescent upon veins, not paler; petioles pubescent, as long as the leaves: peduncles an inch or so long, axillary, solitary, 1-flowered, deflexed in fruit: calyx short-cylindric from an ovate base, densely pubescent, very obscurely angled, 4 to 5 lines long, persistent in young fruit; the limb of 5 erect unequal linear teeth: corolla funnel-formed; tube rather slender, 1½ inches long including the but slightly ampliate throat; limb spreading, very shallowly 5-lobed, inch in diameter: anthers longitudinally dehiscent: young fruit ovoid, smooth, 3 or 4 lines in length, loosely surrounded by the calyx.—Collected on Hood Island, July, 1891. A plant certainly new to the flora of the islands and of interesting, apparently somewhat anomalous generic affinities, possessing on the one hand the corolla, smoothish fruit, and more or less persistent calyx of *Nicotiana*, but the leaves, axillary inflorescence, and general habit of a *Datura*. Insufficient material prevents a more accurate disposition.

VERBENA GRISEA. Densely and somewhat sericeously grayish tomentose, in parts brownish or ferrugineous in dried state: stem

tetragonal, somewhat furrowed; internodes in specimens at hand considerably exceeding the leaves: the latter all opposite, petiolate, bipinnatifid, ovate or deltoid in outline, an inch or more in length; rhachis and segments very narrow, not a line in width, frequently curled, obtusish, so densely pubescent as to obscure completely the venation on both surfaces: inflorescence branched; flowers small, in slender loose elongating spikes; central spike floriferous almost from base; the others more or less pedunculate; bracts small, subulate, pubescent, $\frac{1}{3}$ to $\frac{2}{3}$ the length of the calyx: the latter cylindrical, a line long, hirsute-pubescent on the outer surface, 5-ribbed; limb very shallowly and obtusely 5-toothed: corolla nearly twice as long as the calyx, unequally 5-lobed, pubescent in the throat; segments rounded at the apex: anthers unappendaged.—Collected on Duncan Island, August, 1891. A species of § *Leptostachya* and with much the habit of *V. remota* Benth., but differing in pubescence and foliage.

ALTERNANTHERA RIGIDA. Fruticose, copiously and densely branched: cortex light yellow, lucid: branches opposite, rigid, spreading or divaricate; internodes short, glabrous or nearly so: leaves opposite and proliferous in their lanate axils, very small, subulate, pungent, entire, smooth and green, about two lines in length, three-fourths line in breadth at the sessile base: spikes capitate, ovate or oblong, terminal upon the branchlets, 4 to 6 lines in length, about 3 lines in diameter, bright white, slightly villous in the axils of the bracts, otherwise glabrous: bracts ovate, acute, two-thirds the length of the flower, white and scarious; bractlets 2, ovate-lanceolate, somewhat falcate, equalling the calyx: stamineal tube about as long as the antheriferous processes; sterile processes none: stigmas 2, erect, obtuse.—Collected on James Island, on Orchilla Bay, August, 1891. A noteworthy plant differing much in its erect firm habit and rigid subulate leaves from any species known to the writers.

FRŒLICHIA JUNCEA. Stem woody below, profusely branched above; branches opposite, ascending, slender, terete, finely striate, puberulent or glabrous; internodes elongated: leaves reduced to minute scales, scarcely half line long, ovate, acute, scarious toward the edges: inflorescence terminal, loosely spicate, slender and flexuous, 1 to $2\frac{1}{2}$ inches long; flowers sessile, scattered, solitary in alternate bracts; the lowest still more remote; bracts short, broader than long, obtuse, half line long, slightly if at all pubescent; bractlets broadly ovate, retuse, glabrous, scarious: calyx deeply 5-parted, in fruit ovoid, ribbed, slightly compressed, firm in texture, dark colored, a line long; divisions oblong-lanceolate, obtusish, scarious-margined: stamens included; anthers slightly exceeding the alternating obtusish sterile lobes of the stamineal tube.—Collected on South Albemarle and Barrington Islands, July, 1891. A species with the juncoid habit of *F. nudicaulis* Hook. fil., but differing much in its elongated scattered inflorescence, glabrous bractlets, etc. A doubtful and entirely sterile specimen was also collected on East Albemarle.

EUPHORBIA GALAPAGEIA. Ascending, a span high: stems slender, branching from near the base, terete, brown, under a lens finely and densely pubescent; cortex pealing off below; branches rather short, very slender, alternate, ascending: leaves opposite, glabrous, mostly erect, essentially entire, oblong, obtuse or roundish at the apex, obliquely cordate at the base, short-petioled, 3 to 6 lines long, half as broad, somewhat pellucid in the interstices of the veins; stipules minute, lanceolate, somewhat fringed: involucres alternately fascicled in the upper axils, on very short pedicels, very small, one-third line long; glands 4, unappendaged, not dark-colored: capsule ovate; cells finely crested upon their rather sharp dorsal keels, half line long; the three styles short, bifid; seeds yellowish-brown, finely sculptured.—Collected on Charles Island, June, 1891. A species with the habit of *E. flabellaris* Ands., but more slender: leaves mostly smaller, stem and fruit pubescent, glands smaller and not dark-colored, and styles much shorter.

EUPHORBIA NUMMULARIA Hook. fil. var. GLABRA. Glabrous throughout and somewhat glaucous: leaves nearly all unequally 2-lobed with an oblique sinus between the lobes: seeds slightly longer and a little more decidedly angled than in the type.—Collected at Cuevas Bay, Charles Island, July, 1891.

ACALYPHA BAURII. Herbaceous: stem and petioles densely pubescent-tomentose: leaves ovate, short-acuminate, rather regularly and somewhat doubly crenate-dentate, appressed-pubescent upon both surfaces, especially upon the veins beneath, 1½ to 3 inches long, two-thirds as broad, 5-nerved from the truncate or subcordate base; petioles ascending, 1 to 2 inches long; stipules small, subulate-setaceous: spikes axillary, slender, 2½ inches in length, androgynous; pistillate involucres commonly solitary, 2-flowered, sessile near the base of the spike, the slender staminate portion of the spike about a line in diameter, flexuous, loosely flowered below; rhachis densely grayish pubescent: bracts of the fertile flowers broadly ovate, somewhat unequally 9-dentate, cleft a third of the way to the base, villous, 2½ to 3 lines long, 4 lines broad: calyx deeply 3-cleft; segments ovate, acute, ciliate: styles laciniately many-cleft; capsule villous, nearly a line long; seeds ovate, very finely pitted.—Collected on the southwest end of Chatham Island, June, 1891. A single detached perhaps terminal inflorescence has several fertile involucres.

ARISTIDA VILLOSA. Annual: root a cluster of short delicate fibres: culms several, slender, ascending, nearly a foot in height; internodes minutely puberulent under a lens: blade of leaves thin, flat, narrowly linear, 2 to 5 inches long, 1 to 1¼ lines broad, also finely puberulent and slightly scabrous and hispid upon both surfaces; sheaths conspicuously silky-villous with soft white spreading hairs except near the base; the summit covered with more densely tufted hairs; ligules laciniately ciliate: panicles 1½ to 3 inches long, condensed and subspicate, 4 lines in diameter; lowest branchlets scarcely imbricated: sterile glumes nearly equal, lan-

ceolate to linear, attenuate, shortly aristate, 3 lines long, closely puberulent, ciliate upon the keel; spreading aristæ of the flowering glumes 2 to 5 lines long; rhachis and rhachillæ finely puberulent.—Collected on Jervis Island, August, 1891.

LEPTOCHLOA ALBEMARLENSIS. Decumbent: culms 8 to 12 inches or more in length, slender, much branched, geniculate below; branches approximate, ascending; internodes glabrous, short: leaves somewhat scabrous; blade lance-linear, acute, divaricately spreading, 8 to 12 lines long, about a line broad; sheaths sparsely pilose with delicate white spreading hairs: panicle with slender alternate nearly divaricate branches (4 to 10 lines long); spikelets closely appressed, somewhat imbricated, 2½ to 3 lines long, with about three perfect flowers and rudiment: sterile glumes somewhat unequal; the outer and larger one 2¾ lines long, acute, exaristate; flowering glumes 1½ lines long, 3-nerved, slightly bifid and tipped with short awn, sometimes ciliate.—Collected on South Albemarle Island, July, 1891. From character this must be near *A. brachiata* Steudel.

The following is a complete list of Dr. Baur's plants. Those species which appear never to have been previously reported from the Archipelago are marked with an asterisk (*), and the new plants with a dagger (†). The Lichens have been determined by Miss Clara E. Cummings.

NAMES OF PLANTS.	Chatham.	Charles.	Albemarle.	Hood	Duncan.	Indefatigable.	Jervis.	Barrington.	James.	Bindloe.
Cissampelos Pareira Linn.	×	×								
Drymaria cordata Willd. (=? *D. glaberrima* Bartl.)	×									
Polygala obovata Hook. fil. (forma *latifolia*)		×								
" *puberula* Ands.						×				
" *Galapageia* Hook. fil.	×	×	×							×
" *insularis* Bennett	×					×	×			
**Anoda acerifolia* DC.		×								
**Sida paniculata* L.		×								
" *rhombifolia* L.	×	×				×				
Abutilon Andersonianum Garcke. ?								×		
Gossypium Klotzschianum Ands.	×		×	×				×		
Waltheria reticulata Hook. fil.		×	×			×	×	×		×
Oxalis corniculata L.	×									
" *carnosa* Molina					×					
" *Agassizi* Rose		×		×		×				
Tribulus sericeus Ands.		×								
Xanthoxylon Pterota HBK.	×									
Castela Galapageia Hook. fil.	×	×	×		×		×			×
Maytenus obovatus Hook. fil.	×	×	×	×			×	×		
Discaria pauciflora Hook. fil.	×		×					×		
" sp.				×						
Cardiospermum corindum L.	×		×							
**Sapindus* (near *S. acuminatus* Willd.)			×							
**Dodonæa viscosa* Jacq.			×							
Spondias Edmonstonei Hook. fil.			×							

Names of Plants.	Chatham.	Charles.	Albemarle.	Hood.	Duncan.	Indefatigable.	Jervis.	Barrington.	James.	Bindloe.
Crotalaria puberula Hook. fil.	×									
Dalea parvifolia Hook. fil.		×				×			×	
" *tenuicaulis* Hook. fil.			×							
Tephrosia litoralis Pers.	×									×
**Stylosanthes scabra* Vog.		×				×	×			×
**Desmodium incanum* DC.	×									
" *molle* DC.		×		×		×	×			
* " *uncinatum* DC.	×									
* " *spirale* DC.										×
**Erythrina velutina* Willd.										
Phaseolus semierectus L.	×	×							×	
" *mollis* Hook. fil.							×			
Rhynchosia minima DC.								×		×
**Cæsalpinia Bonducella* Fleming			×							
Parkinsonia aculeata L.	×	×	×	×	×					
Cassia occidentalis L.	×									
Prosopis dulcis Kth.	×									
Neptunia Surinamensis Steud.	×	×				×	×			
Desmanthus depressus Benth. and Hook.	×			×						
Acacia tortuosa Willd.									×	
" *macracantha* Benth. and Hook.		×				×				
**Miconia* sp.	×									
Mentzelia aspera L.	×	×								
Passiflora fœtida Cav.	×									
" *suberosa* L. var.				×						
**Momordica Charanta* L.			×							
Sesuvium Edmonstonei Hook. fil.								×		
Trianthema monogyna L.		×								
Mollugo flavescens Ands.	×	×	×							
" *gracillima* Ands.									×	
**Hydrocotyle umbellata* L.	×									
Spermacoce tenuior Linn.	×									
**Borreria* (*Spermacoce asperifolia* Mart. and Gal.?)	×									
† " *Pacifica* Rob. and Greenm.						×				
† " *Baurii* Rob. and Greenm.	×									
† " *Galapageia* Rob. and Greenm.					×					
" *divaricata* Hook. fil.		×								
" *suberecta* Hook. fil.			×							
" *ericæfolia* Hook. fil.		×	×							
" *dispersa* Hook. fil.	×	×								
" *linearifolia* Hook. fil.			×					×		
Psychotria rufipes Hook. fil.	×									
" *angustata* Ands.				×						
Ageratum conyzoides Linn.		×								
Erigeron tenuifolius Steetz non Hook. fil.		×								
" *tenuifolius* Hook. fil. ?			×		×					
" sp.		×								
**Baccharis Pingræ* var. *angustissima* DC.			×							
Lecocarpus pinnatifidus Dcne.		×								
†*Acanthospermum lecocarpoides* Rob. and Greenm.				×						
**Eclipta alba* Hassk.	×									
Scalesia Darwinii Hook. fil.		×								
† " *Baurii* Rob. and Greenm.					×					
" *decurrens* Ands.			×							
Blainvillea rhomboidea Ands.		×		×	×					

Names of Plants.	Chatham.	Charles.	Albemarle.	Hood.	Duncan.	Indefatigable.	Jervis.	Barrington.	James.	Bindloe.
Macræa laricifolia Hook. fil.	×	×								
Bidens leucantha Willd.	×									
Porophyllum ellipticum Cass.	×	×		×			×		×	
Pectis gracilis Hook. fil.	×	×					×	×		
" *tenuifolia* DC.			×							
" *linearis* Ands.						×				
Plumbago scandens Linn.		×	×		×					
Vincetoxicum ?		×	×							
Cordia lutea Lam.	×	×		×	×		×	×		×
" *Scouleri* Hook. fil.	×									
" sp.					×					
" *linearis* Hook. fil.		×	×							
" *scaberrima* Ands.			×			×				
" *leucophlyctis* Hook. fil. ?									×	
Coldenia (Galapagoa) Darwinii Hook. fil.			×			×			×	×
" " *fusca* Hook. fil.	×			×						
Tournefortia psilostachya Cham.				×						
" *pubescens* Hook. fil.			×		×					
" *strigosa* Ands.			×							
" *rufo-sericea* Hook. fil.			×							
" *opaca* Ands.	×									
Heliotropium Curassavicum L.	×									
" *parviflorum* L.	×	×			×					
Ipomœa acuminata R. and S.	×									
" *pentaphylla* Jacq.				×		×	×			
" *Kinbergi* Ands.						×	×			
Evolvulus simplex Ands.	×	×								
" *glabriusculus* Choisy	×	×								
Cuscuta gymnocarpa Englm.			×							
**Solanacea*				×						
Lycopersicum esculentum Willd.			×	×						
Solanum nigrum Linn.			×		×					
Physalis pubescens Linn. (=? *P. angulata* L.)	×	×								
Capsicum annuum Linn.	×									
Acnistus n. sp. ? (near *A. ellipticus*)	×									
Lycium ?				×						
Scoparia dulcis Linn.		×								
Capraria biflora Linn.		×								
Lantana peduncularis Ands.		×	×		×		×			×
Lippia rosmarinifolia Ands.			×							
* " *nodiflora* Michx.	×	×								
" ?			×							
Bouchea sp.		×								
Verbena littoralis HBK.		×								
† " *grisea* Rob. and Greenm.			×							
Clerodendron molle HBK.	×	×	×							
Avicennia tomentosa Linn.		×								
Hyptis spicigera Lam.						×				
Salvia occidentalis Sw.	×	×								
Teucrium inflatum Sw.	×									
Boerhaavia hirsuta Linn.	×	×								
Cryptocarpus pyriformis HBK.		×		×				×	×	
Amarantus squarrulosa (Gray) U. and B.							×			
" *Caraccasanus* HBK.			×							
" *sclerantoides* Ands.	×			×						

Names of Plants.	Chatham.	Charles.	Albermarle.	Hood.	Duncan.	Indefatigable.	Jervis.	Barrington.	James.	Bindloe.
Telanthera vestita Ands.						×				
" *angustata* Ands.	×		×							
" *nudicaulis* Moq.			×						×	
" *echinocephala* Moq.	×		×	×	×				×	
" *flavicoma* Ands.	×			×						
†*Alternanthera rigida* Rob. and Greenm.									×	
" *frutescens* R. Br.	×									
†*Frœlichia juncea* Rob. and Greenm.			×							
**Peperomia* sp.	×									
Viscum Henslovii Hook. fil.	×									
Euphorbia nummularia Hook. fil.	×									
† " " var. *glabra* Rob. and Greenm.		×								
" *articulata* Ands.		×	×						×	×
" *diffusa* Hook. fil.							×			
† " *Galapageia* Rob. and Greenm.		×								
" *flabellaris* Ands.						×				
" *punctulata* Ands.				×	×					
" *viminea* Hook. fil.	×		×				×	×	×	×
Phyllanthus Caroliniensis Walt. (=? *P. obovatus* Muhl.)	×									
Croton Scouleri Hook. fil.	×			×				×		
" *incanus* Ands.		×								×
" *Macræa* Hook. fil.			×						×	
" *Xalapensis* HBK.	×									
†*Acalypha Baurii* Rob. and Greenm.	×									
" *parvula* var. *flaccida* Müll. Arg.					×					
" " *procumbens* "	×	×								
" " *genuina* "			×							
" " *pubescens* "		×			×	×	×	×		×
" " *cordifolia* " ?							×			
" " *strobilifera* "	×		×							
Fleurya æstuans Gaud. var. *tuberculata* Wedd.			×							
Pilea sp.	×	×								
**Tillandsia* sp.					×					
Hypoxis erecta Willd.	×									
Commelina agraria Kunth.					×					
Cyperus rubiginosus Hook. fil.	×			×	×					
" *brachystachys* Hook. fil.		×	×							
" *Mutisii* var. *plenus* Ands.	×									
* " *fugax* Liebm.	×									
* " *tristachyus* Böckl. ?	×									
**Kyllingia cæspitosa* Nees.		×								
**Dichronema leucocephala* Michx.	×									
**Hemicarpha subsquarrosa* Nees.	×									
**Scleria pratensis* Lindl.	×									
Paspalum conjugatum Berg.	×									
" *canescens* Ands.			×							
" *vaginatum* Sw. ?									×	
Panicum hirticaulon Presl.				×						
" *fuscum* Sw.		×								
Oplismenus setarius Presl. (=? *O. Colonus* HBK.)	×									
Setaria Antillarum Kunth.	×									
Cenchrus platyacanthus Ands.				×						
" *granularis* Ands.		×								
" *distichophyllus* Griseb. ?				×						

Names of Plants.	Chatham.	Charles.	Albemarle.	Hood.	Duncan.	Indefatigable.	Jervis.	Barrington.	James.	Bindloe.
**Stenotaphrum Americanum* Schrank	×	×								
Anthephora elegans Schreb.	×	×								
Aristida caudata Ands.						×				
" *divulsa* Ands.										×
" *subspicata* Rupr. and Trin.			×					×		
† " *villosa* Rob. and Greenm.							×			
**Chloris* sp.		×								
* " *radiata* Sw.		×								
Eutriana pilosa Hook. fil.			×				×			
Eleusine Indica Gærtn.	×									
* " *Ægyptiaca* Pers.				×						
Leptochloa Lindleyana Kunth.			×							
† " *Albemarlensis* Rob. and Greenm.			×							
Eragrostis ciliaris Link.	×	×							×	
Poa megastachya Koel.								×		
**Alsophila* sp.	×									
Adiantum Henslovianum Hook. fil.	×									
Cheilanthes microphylla Sw.	×									
Pteris pedata Linn.	×	×								
" *aquilina* L. var. *caudata* H. and B.	×									
Blechnum occidentale L.	×									
**Asplenium cicutarium* Sw.	×									
* " *farinosum* Willd.		×								
* " *auritum* Sw.	×									
Aspidium molle Sw.		×								
**Nephrolepis cordifolia* Presl.	×									
Polypodium Paradiseæ Langsd. and Fisch.	×									
* " *squamatum* L.	×	×			×					
**Gymnogramme leptophylla* Desv.		×								
* " *calomelanos* Kaulf.	×									
Acrosticum aureo-nitens Hook.		×								
**Lycopodium clavatum* L.	×									
Frullania atrata Nees.	×									
Roccella fuciformis (L.) Ach.		×	×	×						
" *intricata* Mont.		×								
Ramalina sp.		×	×	×						
" *Usneoides* (Ach.) Fr.		×								
Usnea barbata (L.) Fr.	×									
Theloschistes chrysopthalmus (L.) Norm. var. *flavicans* Wallr.	×									
**Zonaria lobata* Agh.	×									

The following species were collected on islands not mentioned in the above list; from Abingdon Island, *Borreria ovalis* Ands. (form), *Telanthera echinocephala* Moq., and *Euphorbia viminea* Hook. fil.; from Gardner Island, *Bastardia viscosa* HBK., and *Xanthoxylon Pterota* HBK.; from Tower Island, *Waltheria reticulata* Hook. fil., *Lantana peduncularis* Ands., *Euphorbia amplexicaulis* Hook. fil., *Euphorbia viminea* Hook. fil., *Croton Scouleri* Hook. fil., and *Eragrostis ciliaris* Link.

II. *New and Noteworthy Plants chiefly from Oaxaca collected by Messrs. C. G. Pringle, L. C. Smith and E. W. Nelson.*

MAPPIA MEXICANA. A shrub, 5 feet in height: branches covered with a light grayish cortex, roughened by many small white lenticels: leaves oblanceolate, short-acuminate to an obtuse tip, cuneate at the base, 3½ to 4½ inches long, 1 to 1¼ inches broad, subcoriaceous, green and glabrous upon both surfaces; midrib prominent beneath; the lateral veins upon the lower surface each with a minute cavity just above the base; petiole puberulent, canaliculate, 4 lines long: flowers 4-5-parted, borne near the ends of the branches in short axillary pedunculate appressed-pubescent panicles (an inch or more in length): calyx minutely pubescent; teeth acutish: petals oblong, 1¼ lines in length, half line broad, entirely glabrous upon both surfaces, obtuse, mucronulate with incurved tip: disk shallowly lobed, glabrous upon both surfaces; ovary and style glabrous.—Collected by C. G. Pringle, in lowlands about Micos, San Luis Potosi, 8 December, 1891 (No. 5494). This plant agreeing rather closely both in habit and essential floral characters with *M. racemosa* Jacq. differs from any known species of *Mappia* in its glabrous petals. The genus appears to be new to Mexico.

MIMOSA MINUTIFOLIA. Branches smooth, grayish, often striated with brown, armed with two kinds of reddish brown spines; the stipular spines in pairs, straight, about 2 lines long; each internode also bearing a single strongly recurved spine: leaves cinereous, bipinnate, oblong in general outline, about an inch in length; petiole a line long; rhachis minutely winged, armed beneath with small spines; pinnæ 15 to 22 pairs, 2 lines in length; leaflets 10 to 20 pairs, elliptical, very minute, half line long, about two-thirds as broad, smooth and cinereous above, very minutely pruinous on lower surface, ciliated on the margin: peduncles solitary, half inch in length, finely pubescent; heads globose: calyx three-fourths line long; segments oblong, obtusish, two-thirds as long as the tube, somewhat thickened at the apex: pods oblong, narrowed at both ends, 14 to 18 lines long, 3 to 4 lines broad, cinereous-tomentose, and densely covered on the surfaces as well as the margins with weak straw-colored spines.—Fruiting specimen collected by C. G. Pringle, on rocky hills near Rio Blanco, Jalisco, 26 May, 1891 (No. 5142). This species belongs to the *Acanthocarpæ* and is most nearly related to *M. flexuosa* Benth. and *M. acanthocarpa* Benth. It is well characterized by its finely divided foliage. In each pinna the rhachis is provided with groups of minute dark-colored glands scarcely visible except under the compound microscope.

SEDUM CALCICOLA. Perennial, procumbent, nearly or quite smooth: stem nearly terete, somewhat ligneous near the base; the floriferous branches 8 to 12 inches high: leaves scattered, the lower oblong-lanceolate, acutish, 6 to 8 lines long, 3 lines broad; the upper thick, terete; nearly half inch long, falling off at touch: inflorescence terminal of about three divergent racemes; the lat-

ter 1½ to 2 inches long; pedicels less than a line in length: sepals green, oblong, obtusish, 1¼ lines long: petals lanceolate-attenuate, 2½ lines long: scales short and broad, truncate: stamens 10: carpels 5, united a third of their length, attenuate, many-ovuled, as long as the petals.—Collected by C. G. Pringle, on limestone ledges, Las Cuevas, San Luis Potosi, 30 October, 1891 (No. 5101). Habit of *S. Bourgæi* Hemsl. and from the character also of *S. Guatemalense* Hemsl. From the former it differs in its shorter sepals and shorter and much broader scales: from the latter in its much shorter pedicles, smaller flowers, and broader leaves.

PASSIFLORA PRINGLEI. Stem angulate, hispid with dark colored hairs: tendrils none: leaves 5-lobed to the middle, somewhat narrowed at the base, about 2 inches in diameter, finely pubescent above, paler beneath and sparingly pubescent upon the prominent reticulated veins; lobes ovate, acutish, finely ciliated, entire or more frequently sharply few-toothed; the middle lobe bearing upon the under surface near its base two small round sessile glands; petioles ascending, 6 to 9 lines long, hispid, bearing two stipitate glands at the summit; stipules lanceolate, acuminate, falcate, 2 lines long: peduncles somewhat exceeding the petioles, hispid, bearing 2 to 3 successive linear attenuate bracts and a single terminal flower (2 inches in diameter): calyx-tube broadly campanulate; lobes oblong-lanceolate, acute, 10 lines long, 3 lines broad, greenish white in a dried state: petals oblong-lanceolate, two-thirds as long as the sepals: outer crown of filaments free to the base, exceeding the petals; the middle crown membranous, plicate, inflexed, covering two inconspicuous inner rings: gynandrophore 5 lines long, glabrous, destitute of any fleshy urceola.—Collected by C. G. Pringle, on hills near Patzcuara, Michoacan, 23 July, 1892 (No. 5268).

PIQUERIA SERRATA Gray, var. ANGUSTIFOLIA. Shrubby, 3 to 6 feet high: leaves oblong-lanceolate, finely and rather remotely crenate-serrate, 4 to 5 inches long (including short petiole), 6 to 10 lines broad, gradually narrowed at the base.—Collected by C. G. Pringle, on the Sierra de San Felipe, altitude 9,500 feet, 24 September, 1894 (No. 4827).—With habit and floral characters of the type but differing rather strikingly in the outline and serration of the leaves.

OAXACANIA n. gen. of *Compositæ* (*Ageratæ*). Heads homogamous, many-flowered. Involucre campanulate; bracts 4–5-seriate, 3-nerved, the outer shorter. Receptacle convex, chaff-bearing throughout. Corollas equal, regular, purplish, with slender tube, somewhat dilated above, and 5-toothed limb. Pappus obsolete or an inconspicuous crown of minute teeth. Achenes linear-oblong, 5-angled and rather strongly compressed laterally.—Bushy herbs or suffruticose. Leaves alternate, petiolate, dentate, palmately-nerved. Heads corymbose-paniculate, about 100-flowered.

O. MALVÆFOLIA. Densely and viscidly glandular-pubescent: stems branching, 3 to 4 feet long, very leafy: leaves varying

greatly in size, the larger an inch in diameter on petioles of equal length; the blade cordate, orbicular in outline; the margin shallowly and palmately sinuate-lobed and lobes toothed: heads 8 to 9 lines in diameter.—Collected by C. G. Pringle, growing in crevices of dry cliffs, Tomellin Cañon, Oaxaca, altitude 3,000 feet, 22 December, 1894 (No. 6117). A plant nearly allied to *Alomia*, but differing in the form and arrangement of its leaves, larger heads, and flattened achenes. From *Trichocoronis* it differs among other characters in its chaffy receptacle.

STEVIA ELATIOR HBK. var.? DECUMBENS. Stem strongly decumbent, leafy below, the erect portion nearly naked, 1 to 2 feet high: pubescence of the involucre very fine and appressed, not at all glandular: flowers 6½ to 7 lines long, purple; aristæ of the pappus long, commonly crooked or bayonet-shaped.—Collected by C. G. Pringle, on dry hills near Oaxaca, altitude 6,000 feet, 13 October, 1894 (No. 4974). Perhaps distinct from but very nearly related to this species.

EUPATORIUM PRINGLEI. Fruticose, 8 to 12 feet high: branches terete, light-brown, glabrous: leaves all opposite, petiolate, deltoid-ovate, acutish to sub-acuminate, crenate-serrate, truncate at base, puberulent and slightly scabrous above, paler and soon becoming quite smooth beneath, 15 to 18 lines long, 12 to 14 lines broad: petioles 4 to 6 lines long: branches of the inflorescence opposite, axillary, thyrsoid and together forming a panicle a foot or more in length: pedicels glandular-puberulent: bractlets setose: heads 5 lines long, about 33-flowered: involucral scales lanceolate-oblong, acute, dark-purple, ciliated, glandular-tomentulose and not striate, loosely imbricated, sub-biseriate and not very unequal, about 3 lines long: corollas white or roseate as well as the pappus also.—Collected by C. G. Pringle, on Sierra de San Felipe, Oaxaca, altitude 9,500 feet, 24 December, 1894 (No. 6118). Resembling *E. Rafaelense* Coulter, but differing in its deltoid leaves, truncate at base, and in its thicker densely glandular-pubescent and non-striated involucral bracts.

EUPATORIUM COLLODES. Fruticose: essentially glabrous and more or less glutinous, 2 to 3 feet high: branches striate-angulate: leaves opposite, ovate, closely sessile, acuminate, rounded at base, sharply and finely serrate or serrulate, often purplish-tinged, paler beneath, 3-nerved, commonly somewhat vernicose, 12 to 16 lines long, a little more than half as broad, of rather firm texture: corymbs many-headed; pedicels rather short: bractlets small with revolute tips: heads 20–25-flowered, purplish: scales of the involucres in 2 to 3 series, linear, attenuate, ciliate, purple-tipped: flowers considerably exserted, in dried state white or roseate: young achenes minutely ciliate on the angles.—Collected by C. G. Pringle, on hills, Las Sedas, Oaxaca, altitude 6,000 feet, 1 October, 1894 (No. 4941).

BRICKELLIA NUTANS. Tall, 5 to 8 feet high: stems terete, striate, purple, pubescent: leaves chiefly opposite (only the uppermost alternate), broadly ovate, acuminate, cordate, serrate,

green and puberulent above, paler and pubescent beneath, 2 to 2½ inches long, nearly as broad, 3-nerved at very base; lateral nerves soon branched: petioles 9 lines long, tomentulose: heads on short lateral leafy branchlets, slender-pedicelled, nodding or pendulous, 6 to 7 lines long, about 15-flowered: floral leaves ovate-lanceolate, acuminate or attenuate, serrate or subentire, subsessile: pedicels 4 to 6 lines long, tomentulose: involucral scales regularly imbricated in about 4 series, all obtuse, tomentulose and somewhat arachnoid-pubescent: achenes 2½ lines long, puberulent.—Collected by C. G. Pringle, on Sierra de San Felipe, Oaxaca, altitude 10,000 feet, 24 December, 1894 (No. 6114).

BRICKELLIA LANCIFOLIA. Tall, 5 to 8 feet high: branches slender, terete, striate, tawny, tomentulose and slightly scabrous: leaves all opposite, lanceolate, acuminate, narrowed at the base, obsoletely serrulate, scabrous above, paler reticulated and soft glandular-tomentulose beneath, 2 to 3 inches long, 10 to 12 lines broad; petioles 4 to 7 lines long, fuscous-tomentulose: flowering branchlets opposite, 3–6-headed, shorter than or considerably exceeding the leaves; pedicels slender, glandular-pubescent: heads nodding, 12-flowered, 6 to 9 lines long: involucral scales glabrous except at the obtuse mucronate tip, purplish, finely striate, lucid, imbricated in 4 or 5 very unequal series: achenes villous, at least when young.—Collected by C. G. Pringle, on Sierra de San Felipe, Oaxaca, altitude 8,000 feet, 3 January, 1895 (No. 6109).

GRINDELIA SQUARROSA Dunal, var. HIRTELLA. Branches and lower surfaces of the leaves covered with a fine slightly roughish pubescence; the type and other varieties being glabrous throughout and having the branches often lucid.—Collected by C. G. Pringle, on hills, Las Sedas, Oaxaca, altitude 6,000 feet, 16 August, 1894 (No. 4805).

ACHYROCLINE DEFLEXA. Stems erect, 3 to 4 feet high, strict, branching above, lanate: leaves oblong-lanceolate, acute at both ends, mucronate at apex, scarcely petioled at base, mostly deflexed or pendulous, sparingly arachnoid and green above, densely lanate and white beneath, 1½ to 3 inches long, 5 to 9 lines broad; margins somewhat revolute, irregularly subcrenulate: heads glomerate, about 5-flowered; glomerules corymbous; involucral scales about 9, oblong, obtusish to acutish, pale straw-color to silvery white: flowers all fertile, only one hermaphrodite: achenes ovate, glabrous.—Collected by C. G. Pringle, on Sierra de San Felipe, altitude 7,000 to 8,000 feet, November, 1894 (No. 6054). The other species of this genus hitherto attributed to Mexico have (acc. to descr.) much smaller, narrower leaves, and more deeply colored involucral scales, although the latter feature may very likely vary with age or change in drying.

SIEGESBECKIA REPENS. Perennial: stems several, decumbent and rooting at the base, sending out procumbent branches, ascending a foot or more in height, purplish, glandular-puberulent, about twice dichotomously forked; upper branches slender, erect: leaves

ovate-elliptic, obtuse or obtusish, serrulate, nearly or quite glabrous, green above, paler beneath, 9 to 18 lines long, half as broad; winged petioles nearly as long; uppermost leaves lanceolate, sessile, acutish: heads few, half inch in diameter, on slender densely glandular-puberulent peduncles; outer involucral bracts lanceolate to linear-oblong, obtuse, 4 lines long, a line wide, inconspicuously 3-nerved; inner bracts ovate, acutish: ray-flowers about 11, bearing sterile stamens; ligules nearly 3 lines long, obtusely 3-toothed at the apex and provided at the base on the inner side with 2 smaller teeth: achenes oblique, smooth.—Collected by C. G. Pringle, in cold brooks, meadows of Sierra de Clavellinas, altitude 9,000 feet, 16 October, 1894 (No. 4987).

GYMNOLOMIA TRIPARTITA. Stem slender, glabrous, nearly terete, pale brown, leafy, branched above: leaves partly opposite, others alternate, deeply 3-parted, dark green and scabrous above, much paler and grayish tomentulose beneath, 1 to 2 inches long, nearly as broad; segments oblong, obtuse, 2 to 3 lines broad, entire or with one or two irregular obtuse lateral teeth: petioles short, cuneate-winged: inflorescence corymbose; pedicels 8 lines to 1½ inches in length: involucral scales lanceolate, acute, 3-nerved, glabrescent: ray flowers about 11, yellow, oblong, 3½ lines long: disk conical, 4 lines in diameter: chaff strongly keeled, terminated by a short subulate tip.—Collected by L. C. Smith, at Cuicatlan, altitude 1,800 feet, 22 October, 1894 (No. 239).

PERYMENIUM JALISCENSE. Caudex short, thick, an inch in diameter, giving off numerous fibrous descending roots and several erect or decumbent slender scabrous furrowed stems about 2 feet high: leaves opposite, short-petioled, oblong to linear-lanceolate, obtuse, serrate or subentire, narrowed at the base, conduplicate, spreading and somewhat recurved, about 2 inches long, 3 to 6 lines wide, 3-nerved, scabrous; the lowest pairs considerably shorter and broader; petioles about a line long: heads about 3 together at the ends of the almost naked branches: peduncles very unequal: involucral scales in 3 series; the outer broadly ovate, obtuse, minutely cinereous-pubescent, ciliated upon the margin; the inner longer, about 2 lines in length: rays 8, unequal, about 3 lines long, more than two-thirds as broad, bright-yellow, minutely 3-toothed at the apex, ciliolate toward the base and upon the nerves on the outer surface: mature achenes about 1½ lines long, minutely pubescent toward the apex.—Collected by Dr. Edward Palmer, Rio Blanco, Jalisco, August, 1886 (No. 310), and also by C. G. Pringle, on rocky hills near Guadalajara, 23 August, 1893 (No. 5426). Dr. Palmer's specimen has been referred to *P. Cervantesii* DC. by Dr. Watson, Proc. Am. Acad. xxii, 427, but it has been compared with the type at Geneva through the kindness of Dr. Casimir De Candolle and Monsieur Buser and proves to be quite distinct, nor does it appear to be a form of *P. Mendezii* DC., as suggested by Dr. Watson, which has an umbellate inflorescence. The plant is habitally marked by its strongly conduplicate and somewhat recurved leaves.

ENCELIA (§ GERÆA) HYPARGYREA. Shrub, 5 to 15 feet high: branches terete, striate, scabrous-pubescent: leaves opposite except the uppermost, ovate, acute or somewhat acuminate, cordate, obsoletely or more or less distinctly serrulate, thickish, densely gray-tomentose above, appressed sericeous-pubescent and silvery below, 3-nerved, 2 to 2½ inches long, three-fourths as broad; margins somewhat revolute; petioles about half inch long; floral leaves ovate-lanceolate, subsessile: heads corymbose, about 6 to 8 lines in diameter excluding the oblong yellow rays: the latter 10 to 12 in number: involucre campanulate; scales 2–3-seriate, oblong-linear, obtusish, roughish pubescent: chaff of the disk carinate, oblong, sub-3-dentate, puberulent: achenes 1½ lines long, densely sericeous-pubescent.—Collected by C. G. Pringle, in La Hoya Cañon, Oaxaca, altitude 3,000 feet, 2 November, 1894 (No. 6142).

ENCELIA (§ GERÆA) GLUTINOSA. A tall branching shrub, 10 to 15 feet high: branches covered with a roughish gray bark, somewhat white-woolly near the leaf-bearing summits: leaves alternate, approximate, short-petioled, ovate-lanceolate, acuminate, entire, nearly glabrous, but slightly papillose-scabrous, and almost lucid above, pubescent and not paler beneath, obtusish or scarcely acute at the base: 3 to 4 inches long, 15 to 16 lines broad; petioles densely pubescent, 3 lines in length: inflorescences terminal, corymbose, rather dense; heads nearly half inch in diameter (exclusive of rays), 7 lines in length, vernicose: involucre 2–3-seriate with the outer scales much shorter; scales thick, obtusish, somewhat striated: rays about 8, bright-yellow, fully half inch long: achenes linear-oblong, 4 lines in length, 2-awned, pubescent, and silky-ciliate.—Collected by C. G. Pringle, in La Hoya Cañon, Oaxaca, altitude 4,000 feet, 2 November, 1894 (No. 6024).

ENCELIA (§ GERÆA) RHOMBIFOLIA. Decumbent, densely pilose-pubescent with spreading white hairs, leafy to the middle: leaves (except the reduced uppermost) opposite, rhombic-ovate, acutish, harsh in texture, scabrous and tuberculate-hispidulous above, scarcely paler but more densely and softly pubescent and with frequent argenteous blotches beneath, serrate from below the middle, 3-nerved from above the base, 2 inches long, 12 to 15 lines broad, narrowed in the upper leaves to a sessile somewhat amplexicaul base, the lower short-petioled: inflorescence loose and irregular; heads half inch in diameter, short-peduncled, borne in irregular subracemose groups, 2 to 5 together at the ends of the almost naked branches: scales of the involucre 2–3-seriate, oblong-lanceolate, attenuate, grayish hirsute, the outer shorter: rays 8, yellow, 3½ lines long: achenes flattened, appressed-pubescent, ciliate on the edges; awns 2, with intermediate scales.—Collected by C. G. Pringle, on dry calcareous hills, Las Sedas, Oaxaca, altitude 6,000 feet, August, 1894 (No. 4813).

LEPTOSYNE PRINGLEI. Rootstock short-oblong, thickish and woody; stems several, decumbent, simple and leafy nearly to the middle, a foot or more high, striate-angulate, puberulent below:

leaves pinnate, about an inch long, ascending, puberulent; rhachis and pinnæ narrow, linear, acute and slightly pungent; leaflets usually 3 pairs and an odd one, 3 to 6 lines long; the lower pairs gradually more elongated: peduncles slender, erect, 4 to 6 inches long, 1-headed: head 8 or 9 lines in diameter, often bracteolate; outer involucral bracts herbaceous, about 5, oblong, obtuse, 1½ to 2 lines long; the inner bracts scarious, yellow, ovate-oblong, obtusish, about 3 lines long: rays about 6, yellow, oblong, 3-toothed, fertile, 5 lines long, half as broad; the middle tooth the smallest; achenes obovate, dark-colored, 2 lines long, two-thirds as broad, glabrous, rounded and emarginate at the apex: disk-flowers apparently all fertile, distinctly annulate.—Collected by C. G. Pringle, on the Sierra de San Felipe, altitude 7,000 feet, 7 August, 1894 (No. 4871). Habit of *L. Mexicana* Gray.

SCHKUHRIA PLATYPHYLLA. Erect, stoutish annual: stem terete, striate, pubescent, purplish, simple below: leaves all alternate, broadly ovate, obtuse, coarsely and somewhat doubly crenate-dentate but not at all dissected, abruptly contracted to a 3-nerved cuneate base, densely puberulent upon both surfaces, 2 to 2½ inches long, nearly or quite as broad, slightly paler beneath: petioles pubescent, 4 to 10 inches long: panicle much branched, densely glandular-pubescent: involucral bracts about 5, obovate, rounded at apex, herbaceous but with thin purple margins, glandular-pubescent externally, 2½ lines long: ray flowers none, disk flowers about 20 in a head: scales of the pappus about 8; achenes upwardly pubescent especially near the base, 2 lines long.—Collected by C. G. Pringle, on Monte Alban, Oaxaca, altitude 5,500 feet, 8 October, 1894 (No. 4975). Exceptional on account of its broad undivided leaves.

LIABUM KLATTII. Shrub, 15 to 20 feet high, leaves falling before the flowers appear, deltoid-ovate, obliquely acuminate, cuspidate-serrulate, abruptly contracted to a somewhat cuneate base, glabrous above, gray and densely arachnoid-pubescent beneath, about 5 inches long and nearly as broad, 3-nerved from a point somewhat above the base: flowering branches terete, at first arachnoid but quite glabrate, opposite, recurving, terminating in dense thyrsoid inflorescences: heads 8 lines long: involucral scales lance-linear, attenuate, imbricated in about two unequal series, densely dark glandular-pubescent: flowers bright yellow: pappus nearly white: corolla 5 lines in length.—Collected by C. G. Pringle, on Monte Alban, near Oaxaca, altitude 6,000 feet, 24 November, 1894 (No. 6059). For a critical comparison of this plant with certain neighboring forms we are indebted to Dr. F. W. Klatt, to whom we take pleasure in dedicating the species in recognition of his valuable contributions to the knowledge of American *Compositæ*.

SENECIO GRACILIPES. Herbaceous, perennial, erect, slender, 3 feet or more in height: stem simple up to the loosely paniculate inflorescence, striate, covered below with sparing arachnoid pubescence, above glabrate: leaves oblong in outline, deeply and regu-

larly pinnatifid, green and glabrous above, paler and arachnoid-pubescent beneath; lateral segments in about 8 pairs, divaricate, lanceolate, acuminate, repand-dentate, about 1½ inches long, a third as broad; the terminal one scarcely larger, narrowly deltoid; lower leaves on slender petioles (7 inches long); the upper upon winged petioles, auriculate-clasping at the base; bracts of the diffuse panicle narrowly lanceolate, attenuate, sessile, auriculate-clasping: heads discoid, usually solitary at the end of the slender branches; bractlets subulate-filiform: involucre about 13-phyllous, 4 lines long, pubescent, 20–24-flowered; the scales minutely dark-tipped and tufted at the apex: flowers ochroleucous: corolla segments short: achenes glabrous.—Collected by C. G. Pringle, on the Sierra de Clavellinas, altitude 9,000 feet, 24 October, 1894 (No. 6010).

SENECIO RETICULATUS DC. A plant of habit and foliage identical with an authenticated specimen of this species from De Candolle's herbarium, has been collected by Mr. Pringle on the Nevado de Toluca in the State of Mexico, 7 September, 1892 (No. 5262). The heads, however, have about twice as many flowers (8 rays and 26 disk flowers). The scales of the involucre are also more numerous, being about 16 in number.

CACALIA LONGIPETIOLATA. Slender, 3 feet or more in height, apparently strict: stem terete, purplish and glaucous: leaves palmately 5–7-lobed, 3 to 4 inches in diameter, cordate with narrow sinus, green, puberulent and reticulated above, grayish-tomentulose beneath; lobes lanceolate, stellately divergent, denticulate, acute and mucronate; sinuses rounded; petioles slender, smooth, about 4 inches in length: heads few, large, about 9 lines in length, terminal upon the long slender almost naked branches of an open panicle; involucre calyculate with short loose spreading linear or subulate bracts, the inner erect bracts about 9, oblong, dark-colored with scarious margins, narrowed to an obtusish apex: flowers about 50 in a head; tube slender, thickened at the base; throat ampliate, very short; lobes rather long but recurved or coiled in anthesis: achenes smooth.—Collected by C. G. Pringle, on dry ledges of the Sierra de San Felipe, Oaxaca, altitude 7,000 feet, 10 October, 1894 (No. 5828).

CACALIA MEGAPHYLLA. Tall, 6 to 10 feet high: stem terete, striate, ferrugineous-tomentulose: radical leaves large, centrally peltate, about 10-lobed, orbicular in outline, 1 to 2 feet in diameter, finely pubescent above, slightly paler and grayish-tomentose beneath; lobes ovate-lanceolate, sharply and unequally sinuate-dentate, usually 2–3-lobed toward the apex; secondary lobes only slightly divergent not divaricate with reference to the primary lobes, acute: panicle ample, pyramidal, bracts reduced, subulate; heads numerous, 5-flowered, 5 to 7 lines long, shortly and inconspicuously calyculate at the base or ecalyculate: involucral scales 5, ovate-oblong narrowed to an obtusish apex, densely tomentose, 4 to 5 lines long, nearly or quite 2 lines broad: akenes glabrous, stout, many-striate, light-colored.—Collected by C. G. Pringle, on

hillsides near Guadalajara, 10 October, 1889 (No. 2490). Distributed as *Cacalia peltata* H.B.K., which however differs in its more numerously flowered heads, more leafy inflorescence, in the presence of long linear calyculate bracts, commonly exceeding those of the involucre, also in the more divaricately cleft lobes of the leaves.

CACALIA OBTUSILOBA. Radical leaves subcentrally peltate, orbicular in outline, 6-lobed to the middle, green and glabrate above, somewhat paler and puberulent beneath, a foot in diameter; lobes broad, again irregularly and obtusely lobed and mucronate-denticulate; cauline leaves not seen: stem subsulcate, sordid-tomentulose: inflorescence thyrsoid-paniculate, tomentulose: heads many, 5-flowered, calyculate at base: involucral scales 5, oblong-linear, obtusish, green-backed, and tomentulose, 2½ to 3 lines long: flowers light colored.—Collected by C. G. Pringle, on the Sierra de San Felipe, altitude 6,000 feet, 17 November, 1894 (No. 5840).

CACALIA PAUCICAPITATA. Simple, slender, erect, 3 to 4 feet high: base tuberous, sending off a few stout fibres: stem terete, and as well as the petioles, pedicels, and under surface of the leaves densely white arachnoid-lanate; the indumentum being more or less deciduous: radical leaves sinuate-pinnatifid, 4 to 6 inches long, two-thirds as broad, green and glabrate above, lateral lobes in 3 to 5 divaricate pairs, oblong, acutish, subentire or again more or less divaricately lobed; petioles about equalling the blades; cauline leaves only one or two similar near the base: inflorescence a simple raceme: heads 6 to 8, large, 40–50-flowered, 9 or 10 lines broad, calyculate with loose linear scales: inner involucral bracts about 13, broadly oblong, narrowed to an obtusish ciliolate apex: corolla tube slender, 4 lines long, thickened at the base, throat short; segments narrow: achenes elliptic, densely silky-villous.—Collected by C. G. Pringle, on dry slopes under oaks, Sierra de Clavellinas, altitude 7,000 feet, 25 October, 1894 (No. 6018).

CACALIA SILPHIIFOLIA. Radical leaves ovate-oblong, very deeply cordate, obtuse, shallowly and somewhat doubly sinuate-dentate, nearly a foot in length, 5 inches in breadth, glabrous, pinnately veined, scarcely paler beneath; midrib purplish; petioles wingless, purplish, striate, nearly a foot and a half in length, woolly at the base; lower cauline leaves unknown, the upper reduced to very narrow linear dried bracts, 6 lines to an inch in length: stem green, striate, puberulent; floral leaves filiform: heads very numerous in a much-branched compound corymb, about 8 flowered: scales of the involucre 6 to 8, oblong, acute, strongly carinate, 2½ lines long: corollas 5 lines long, segments two-thirds as long as the tube: achenes ribbed, nearly 2 lines in length.—Collected by C. G. Pringle, on the Sierra de las Crucis, State of Mexico, 21 August, 1892 (No. 5251). Radical leaves resembling in outline those of *Silphium terebinthinaceum* L. They are thinner and less strongly reticulated than in the

related species, *C. pachyphylla* Sch. Bip. and *C. Palmeri* Greene, besides being of very different shape.

CACALIA TRIDACTYLITIS. Tall, 8 feet high: stem leafy, sulcate-angulate, purplish, tomentulose: leaves trifid at least to the middle, green and puberulent above, paler and grayish-tomentose beneath, 3 to 6 inches long, nearly as broad, pinnate-palmately 5-7-nerved from somewhat above the cuneate base; lobes lanceolate, acute, somewhat incised-dentate: inflorescence a broad corymbous panicle leafy at base: heads very numerous, 5 lines in length, about 10-flowered, calyculate: involucral scales about 7, oblong-linear, acute, somewhat keeled, scarious margined, glabrate: flowers white, considerably exceeding the involucres: achene ribbed, glabrous.—Collected by C. G. Pringle, on the Sierra de San Felipe, Oaxaca, altitude 6,000 feet, 19 November, 1894 (No. 5841).

CNICUS IMBRICATUS. Slender, 3 to 5 feet high: radical leaves narrow and elongated 10 to 18 inches long, an inch wide, divided to the rhachis; the broadly ovate, angulate spinose-dentate lobes very numerous, about 80, mostly attenuate and regularly imbricated, green and puberulent, glabrate above, grayish-arachnoid beneath; cauline leaves narrowly oblong, pinnatifid, decurrent at the base, 2 to 3 inches long; lobes short, spinose-dentate: heads terminal and solitary on long slender branches, nodding, depressed-globose, 1¼ inches in diameter: involucral scales linear-lanceolate, spinose-tipped, the outer spinose-ciliate, the inner elongated, densely purplish-lanate.—Collected by C. G. Pringle, in wet meadows, Sierra de Clavellinas, altitude 9,000 feet, October, 1894 (No. 6006). A very attractive species.

UROSTEPHANUS n. gen. of *Asclepiadaceæ* (*Gonolobeæ*). Calyx 5-parted, glanduliferous at the sinuses within. Corolla rotate, 5-parted; tube short; lobes flat, ovate or oblong, with dextrorsely imbricated margins. Corona borne upon the lower part of the column, tubular, nearly equalling the gynostegium, shallowly parted at the summit into 5 internal hornlike processes opposite the stamens and five external lobes alternating with them and produced on their outer surface and just beneath the apex into two filiform flexuous tails. Stamens united with the base of the corolla; filaments connate into a very short tube; anther-cells oblique; pollinia solitary in the cells, almost pendulous. Stigma depressed. Fruit and seeds unknown.—Twining. Leaves opposite, ovate, cordate. Flowers umbellate-cymose.

U. GONOLOBOIDES. Hirsute with somewhat tawny hairs subappressed on the leaves and reflexed on the slender stem: leaves ovate, entire, acuminate, cordate with a narrow sinus and rounded lobes, scarcely paler beneath, 2 to 2½ inches long, half as broad; petioles half to three-fourths inch in length: peduncles 2 lines long, 1–5-flowered; pedicels of equal length: lobes of the calyx ovate-lanceolate, acute, nearly 2 lines long; pilose externally, glabrous within: corolla in dried state olive green, pilose externally and covered at the throat within, with a short dense wool;

lobes ovate-oblong, obtusish, 4 to 5 lines long, 2½ lines broad at base: corona black.—Collected by C. G. Pringle, on hills above Oaxaca, altitude 6,000 feet, 6 August, 1894 (No. 4753).

BUDDLEIA FLOCCOSA Kunth. Two forms of this species are shown by Mr. Pringle's 6025 (=6139) and by his 4925 from Oaxaca. The former numbers represent the typical form with rounded, deflexed interpetiolar appendages, while in the latter number these stipular structures are obsolete. No other differences have been noted. The unappendaged form has also been secured in Guatemala by Donnell-Smith and von Tuerckheim.

IPOMŒA BRACTEATA Cav. var. PUBESCENS. A woody vine loosely twining to 15 feet: branches and petioles pubescent: leaves irregularly few-toothed, appressed sericeous-pubescent upon both surfaces.—Collected by C. G. Pringle, on barrancas near Guadalajara, altitude 4,500 feet, 3 May and 9 July, 1894 (No. 4734).

IPOMŒA SUFFULTA Don. (*Convolvulus suffulta* HBK. Nov. Gen. et Spec. iii, 102, t. 211). So far as we can learn this species has never been collected since it was first found upon the volcano Jorullo by Humboldt and Bonpland. It has now been rediscovered in Oaxaca, having been secured by C. G. Pringle (No. 4755); on Monte Alban, altitude 5,800 feet by L. C. Smith (No. 141); and Valley of Oaxaca, altitude 6,500 to 7,800 feet, by E. W. Nelson (No. 1541). The root, apparently not seen by Kunth, is thick and woody: the stems many, slender, prostrate-ascending.

JACQUEMONTIA SMITHII. Suffruticose at base: much branched: stems procumbent: branches puberulent, ascending, 2 to 3 feet high, not twining: leaves ovate, acutish, mucronate, cordate, entire, puberulent upon both sides, the larger 1½ to 2 inches long, two-thirds as broad; petioles 1 to 9 lines long: peduncles slender, 1 to 2½ inches long, loosely 2–5-flowered: pedicels 3 to 4 lines long: outer sepals rhombic-ovate, acuminate, about 3 lines long; the inner narrowly ovate, acuminate: corolla 6 lines long: lobes of the stigma thick, subglobose.—Collected by L. C. Smith, at Cuicatlan, Oaxaca, altitude 1,800 feet, 22 October, 1894 (No. 246); by C. G. Pringle, on dry calcareous soil, San Antonio, altitude 2,500 feet, 1 September, 1894 (No. 4848); and by E. W. Nelson, six miles above Dominguillo, Oaxaca, altitude 6,500 feet, 22 October, 1894 (No. 1600). Foliage and flowers much as in *L. violacea* Choisy, but stem not twining, inflorescence looser, and lobes of stigma strikingly different, being in the latter species slender and almost linear.

SOLANUM PRINGLEI. Herbaceous, unarmed, with a soft gray pubescence; hairs simple, those of the stem and petioles spreading, of the leaves appressed: leaves single below, geminate above, ovate, acuminate, abruptly contracted to an acute base, 2 to 5 inches long, two-thirds as broad; petioles 4 to 12 lines long: flowers an inch in diameter, blue, axillary in pairs; pedicels an inch or more in length: calyx urceolate with 5 or 10 small obtuse dark-colored prominences below the thin shallowly and bluntly

3–4-lobed rim: corolla rotate, pentagonal, nearly entire: stamens erect, unequal, one longer: fruit globose, bright red, nearly half inch broad.—Collected by C. G. Pringle, in mountain cañons near Guadalajara, 18 November, 1892 (No. 5343).

CHAMÆSARACHA POTOSINA. Densely glandular-pubescent, freely branched: stems and branches subterete, finely striate: leaves geminate, ovate-lanceolate, acute, contracted below to a shortly cuneate base, thin in texture, the larger ones 18 to 22 lines long, half as broad: pedicels solitary or less frequently in pairs, 4 lines long in anthesis: calyx 5-toothed almost to the middle, nearly enveloping and closely appressed to the fruit, but finally ruptured and more or less reflexed, teeth ovate, acute, ciliated: corolla rotate, 5-toothed, nearly to the middle, 4 lines broad, pale yellow, pubescent in the throat; segments ovate, acute, pubescent upon the outer surface near the tip and ciliate: filaments nearly twice as long as the oblong anthers: fruit globose, red, the size of a pea.—Collected by C. G. Pringle, in Tamasopo Cañon, San Luis Potosi, 25 November, 1890 (No. 3654). Leaves quite entire, thinner than in the other Mexican species, and corollas smaller and more deeply divided.

SARACHA GRANDIFLORA. Densely cinereous-pubescent: stems angulate, tomentose: leaves single or geminate, ovate, undulate or somewhat sinuate-dentate, obtusish, appressed-villous upon both surfaces, pale beneath, $2\frac{1}{2}$ inches long, 2 inches broad, abruptly contracted at the base but decurrent into tomentose petioles 6 to 7 lines in length: peduncles axillary, 3 to 7 lines long, about 3-flowered; pedicels 7 to 9 lines in length: calyx appressed-villous, about 10 lines broad in anthesis, $1\frac{1}{4}$ inches in fruit, with 5 shallow triangular blunt lobes: corolla pentagonal, scarcely lobed, pubescent on the outer surface, conspicuously ciliated, 14 lines in diameter: stamens rather close in the throat; filaments nearly or quite glabrous but a line or two long: fruit globular, 5 lines in diameter.—Collected by C. G. Pringle, on hills near Patzcuaro, Michoacan, 22 July, 1892 (No. 5273).

JUSTICIA LINEARIS. Tomentulose, fruticose: leaves linear, crowded near the ends of the ascending cinereous branches, erect, an inch in length, a line in breadth, 1-nerved, sessile; margins strongly revolute: flowers sessile, axillary: calyx deeply 5-parted; segments sub-equal, linear, attenuate, 4 lines long: corolla pubescent upon the outer surface especially upon the veins, about 9 lines in length with an ampliate throat, the upper lip very shortly bifid; the lower more deeply 3-parted, the segments rounded, the middle one the largest: stamens of the genus: styles slightly pubescent below, minutely and unequally bidentate at the apex; valves of the capsule half inch long.—Collected by C. G. Pringle, upon dry hills, Las Tablas, San Luis Potosi, 5 August, 1891 (No. 5038). This species showing all the floral characters of *Justicia*, is very distinct in habit from any species known to us. It was collected in a season of especial drought and only a very limited quantity of material secured.

LIPPIA NUTANS. Shrub with grayish glabrate stems and pale brown angulate sparingly puberulent branchlets: leaves ovate-acutish, cuneate at the base, thickish, strongly rugose-warty, hispidulous and slightly lucid above, paler and rather densely pubescent beneath, an inch long, two-thirds as broad; petioles about 2 lines long, canaliculate and hispid pubescent above: peduncles slender, commonly recurved and nodding, opposite in the upper axils, pubescent, about 9 lines long: heads globose, an inch in diameter: bracts ovate, obtuse, reticulated, glandular-pubescent upon both surfaces and ciliate, thin, pale, and subchartaceous, the lowest ovate; the upper more elliptic, 4 to 6 lines long, half as broad: flowers shortly pedicellate, 3½ lines long: calyx densely pubescent.—Collected by C. G. Pringle, in Las Hoyas Cañon, Oaxaca, altitude 4,500 feet, 2 November, 1894 (No. 5650).

LIPPIA OAXACANA. Shrub, 3 to 5 feet high: stems cinereous, smoothish, subterete; branchlets canescent-tomentose: leaves ovate-oblong, obtuse or rounded at the base, acute or obtuse at the apex, 10 to 18 lines long, half as broad, very rugose and densely pubescent above, paler and tomentose beneath, crenulate-serrulate, short petiolate: inflorescences terminal on the branches, rather dense and spike-like, 2 inches long, nearly an inch in diameter, somewhat looser and rarely branched below: bracts rhombic-obovate, yellowish green, 4 lines long, half as broad, abruptly acuminate, pubescent upon the outer surface, ciliate upon the margin, 1-flowered; flowers 2¼ lines long: calyx 2-lobed, densely pilose-pubescent: corolla 4-lobed, 1½ lines long, sparingly pubescent externally: fruit pear-shaped.—Collected by C. G. Pringle, on dry limestone hills, Las Hoyas Cañon, Oaxaca, altitude 5,000 feet, 1 November, 1894 (No. 6021); and by E. W. Nelson, six miles above Dominguillo, altitude 5,000 to 6,000 feet, 3 October, 1894 (Nos. 1586 and 1841).

STACHYTARPHETA NELSONII. Fruticose: branches cinereous: branchlets more or less distinctly 4-angled, sordid-tomentulose: leaves opposite, or nearly so, rhombic-ovate, serrate-dentate from below the middle, acutish, rather abruptly contracted at the base and then decurrent upon the petiole, appressed-pubescent above, paler and tomentulose beneath, 1 to 1½ inches in length, 6 to 8 lines in breadth: spikes 2 to 4 inches long, 4 lines in diameter: bracts lance-linear, acute, pubescent upon both surfaces, not strongly ciliated, 3 lines long, a line broad below: calyx split two-thirds of the way to the base on the ventral side, 4 lines long; externally pubescent, teeth cohering: corolla curved and nodding, 7 lines long, externally glabrous, pubescent in the throat, purple. —Collected by E. W. Nelson, six miles above Dominguillo, Oaxaca, altitude 5,000 to 6,500 feet, 30 October, 1894 (No. 1590). Habit nearly as in *S. acuminata*, DC., which was also collected by Messrs. Pringle and Nelson. The latter species is much less pubescent and has longer and conspicuously ciliate bracts.

SALVIA LITTÆ Vis. Specimens have just been received which agree in all essential characters with Bentham's description of the above species in DC. Prodr., but the plant differs, however, in being herbaceous, as noted by the collector, and also in having a sparingly pubescent style. Without access to the type it is impossible to say, with absolute certainty, whether or not this plant is the same.—Collected by C. G. Pringle, on Sierra de Clavellinas, Oaxaca, altitude 9,000 feet, 18 October, 1894 (No. 4991); also by E. W. Nelson 18 miles southwest of the City of Oaxaca, altitude 7,500 to 9,500 feet, 10–20 September, 1894 (No. 1342).

SALVIA VITIFOLIA Benth. Excellent specimens, agreeing in all points with the original description, show the root-character not hitherto described. From a knotted root-stock, fleshy fusiform fibres are given off which in the material at hand are a third of an inch in diameter.—Collected by C. G. Pringle, on the Sierra de San Felipe, Oaxaca, altitude 7,500 feet, 26 May, 1894 (No. 4659); also by E. W. Nelson, in the same locality, 1 September, 1894 (No. 1169); and by L. C. Smith, San Juan del Estado, altitude 7,000 feet, 4 June, 1894 (No. 169). Here also should be placed Mr. Seaton's No. 376 from Maltrata.

SALVIA THYRSIFLORA Benth. A shrubby plant with a beautifully thyrsoid inflorescence has been collected by Mr. Pringle on mountains near Patzcuaro, 21 December, 1891 (No. 4097), which corresponds in all particulars to Bentham's description of this species except in having somewhat larger acute leaves (2 inches long) and a calyx puberulent but not glandular-pubescent.

SCUTELLARIA AUREA. Stem branched, densely grayish pubescent: leaves broadly ovate, shortly and acutely acuminate, coarsely crenate-dentate, thin, green and puberulent, much paler and pubescent especially upon the veins beneath, rounded or subcordate at the base, 3 to 4 inches long, 2 to $2\frac{3}{4}$ inches broad; petioles 8 to 15 lines long, densely pubescent: flowers in pairs subtended by small ovate acuminate bracts and forming several elongated simple racemes; pedicels a line long: calyx green, puberulent, ciliate upon the margin, in anthesis 2 to $2\frac{1}{2}$ lines long: corolla an inch in length, puberulent, orange-colored, paler ventrally; the slender proper tube densely and retrorsely pubescent within, throat more or less ventricose; lateral lobes united with the dorsal pair to form the upper lip; the lower lip of a single emarginate lobe.—Collected by L. C. Smith, Rancho de Calderon, Oaxaca, altitude 6,500 feet, 13 August, 1894 (No. 173).

LORANTHUS INORNUS. Stems slender, terete or nearly so, glabrous, scoparious, flexuous, branched: branches spreading, not enlarged at the nodes, essentially terete: leaves alternate, mostly reduced and subulate, the larger 8 lines long, $1\frac{1}{2}$ lines broad, oblanceolate, acutish, cuneate at base, nerveless: flowers axillary, sessile, usually in pairs or solitary, $1\frac{1}{2}$ lines long: calyx cupulate, entire: divisions of the corolla 4, oblong, acutish, caducous and early disclosing the persistent style: fruit ovoid, $1\frac{1}{2}$ lines long,

two-thirds as broad.—Collected by L. C. Smith, at Cuicatlan, altitude 2,000 feet, 27 August, 1894 (No. 122). The *Loranthus*, which in character most nearly approaches this is *L. inconspicuus* Benth., which is said to have ancipital branchlets and obovate oblong obtuse obscurely 3-nerved leaves.

PEDILANTHUS TOMENTELLUS. Tall, 5 to 8 feet in height, rusty tomentulose: branches stout, terete: leaves short-petioled, ovate-oblong to oblong-lanceolate, narrowed at both ends, obtusish, tomentulose upon both surfaces, 2 inches long, an inch broad; cymes terminal, twice dichotomously forked, about 2 inches in diameter, outer floral leaves and those at the forks large, bright red, sessile, broadly ovate or suborbicular, cordate, shortly acuminate, tomentulose, 12 to 15 lines long, inclosing the smaller inner bracts and involucres, thus giving the cyme a somewhat 2-headed appearance: involucres half inch in length, tomentulose, unequally 5-cleft at the mouth, the divisions rounded to subtruncate with an erose or fimbriated margin, the 3 posterior much smaller, linear-oblong; the appendage deeply 2-cleft; divisions about $3\frac{1}{2}$ lines long, lanceolate-obtuse, thickened at the apex: glands 2 or 4: pedicels of the ♂ flowers glabrous; filaments and anthers pubescent; pedicel, ovary, and style of the ♀ flower ferrugineous-tomentose; style $2\frac{1}{2}$ lines long, the 3 divisions 2-cleft.—Collected by C. G. Pringle, in fence-rows, near the City of Oaxaca, August, 1894 (No. 4912); and by E. W. Nelson, 40 miles northeast of the City of Oaxaca, altitude 5,500 feet (No. 1201).

EUPHORBIA MACROPODOIDES. Low, somewhat succulent, 2 to 5 inches high, springing from a dark rough tuber: the latter at first fusiform but becoming much thickened and irregular, $1\frac{1}{2}$ inches in diameter, sending off occasional fibres: stem smooth, weak, hollow, pale and leafless below as though subterranean; copiously dichotomously or alternately branched; branches crowded, leafy: leaves chiefly alternate (a few sub-opposite), slender-petioled; suborbicular to short-oblong, regularly but obscurely serrulate, rounded both at the apex and at the nearly equal base, 2 to 3 lines in diameter, sparingly pubescent or almost glabrous, slightly paler beneath; petioles 1 to $1\frac{3}{4}$ lines long: involucres solitary, axillary, sparingly pubescent, a little over 1 line in diameter, on slender peduncles (3 to 4 lines long); glands 5, reniform with ovate obtuse appendages; lobes of involucre slightly fimbriate: capsule strongly 3-angled, glabrous; styles bifid, spreading; seeds ovoid, grayish, a line long.—Collected by C. G. Pringle, on the Sierra de San Felipe, Oaxaca, altitude 10,000 feet, 26 June, 1894 (No. 4713). Habitally and in floral characters very near *E. macrocarpus* Boiss., but with leaves rounder, longer-petioled, smoother and serrulate.

ACALYPHA GLANDULIFERA. A monœcious shrub, 5 to 8 feet high: branches terete, brownish, finely pubescent: leaves ovate, cordate, tipped with a short caudate point, serrate-dentate, appressed-pubescent above, more densely pubescent or grayish-tomentose beneath, 2 to 3 inches long, two-thirds as broad;

petioles 8 to 16 lines long, densely pubescent; stipules subulate, reflexed, pubescent upon the lower surface, about 2 lines long, at length deciduous: staminate inflorescence elongated flexuous, about 4 inches long, upon peduncles 1 to 4 lines in length: pistillate spike oblong, rather loose-flowered, 1¼ to 1½ inches long, about two-thirds as broad, peduncles slender, rather rigid, ascending, an inch and a half long, cinereous-pubescent below, glandular-pubescent above; bracts 1-flowered, 7-parted; each segment lanceolate and green at the base, elongated to slender purple filiform tips, 4 to 6 lines in length, bearing numerous divaricate glanduliferous hairs: ovary hispid-pubescent toward the apex; styles multifid, reddish-purple.—Collected by C. G. Pringle, wet cañons, Sierra de San Felipe, Oaxaca, altitude 7,500 feet, 13 August, 1894 (No. 4789); and by E. W. Nelson, in the vicinity of Sierra de San Felipe, altitude 9,500 to 11,000 feet, 1 September, 1894 (No. 1165).

PARIETARIA MACROPHYLLA. Suffrutescent and decumbent at base, 1 to 2 feet high, finely pubescent: stem subterete, striate: leaves thin, lanceolate, narrowed both ways, mostly caudate-attenuate to an obtusish falcate secund tip, punctate, nearly glabrous, dark green above, scarcely paler beneath, of variable size, the larger 5 inches long, 1¼ to 1½ inches broad, mostly 3-nerved from the base, on thickish petioles 2 to 2½ inches in length: inflorescence at first glomerate, becoming looser; the axillary cymes 6 to 8 lines long, spreading, very pubescent: lobes of the calyx 4, lanceolate, acuminate, about a line long, twice the length of the tube, nearly glabrous: fruit becoming black and shining, nearly half line in length.—Collected by E. W. Nelson, on the top of the Sierra Madre near Chilpancingo, Guerrero, altitude 9,000 to 10,200 feet, 24 December, 1894 (No. 2231).

SPIRANTHES ERIOPHORA. Roots several, oblong, fleshy, tuber-like: base of stem surrounded by the sheaths of old leaves: leaves radical, narrowly oblong-lanceolate, acute, 3 to 4 inches long, 3 to 4 lines wide, glabrous: stem a foot to a foot and a half high, glabrous below, densely ferrugineous-lanate above, covered throughout its whole length by white and scarious ovate-lanceolate attenuate striate bracts: spike 4 to 6 inches long, 5–10-flowered; floral bracts similar in texture to those of the stem, more ovate, exceeding the flowers: flowers sessile: the erect ovary as well as the external surface of the outer divisions of the strongly deflexed perianth pubescent: the upper sepals oblong-lanceolate, acute: the lateral linear-lanceolate, acuminate, about 7 lines long: lateral petals adnate to the upper sepal; labellum panduriform; margins involute; lateral lobes very short, almost obsolete.—Collected by C. G. Pringle, in pine woods, Sierra de San Felipe, Oaxaca, altitude 9,000 feet, 31 May, 1894 (No. 4682).

SPIRANTHES RUBROCALOSA. Tuberous roots 2 to 4, oblong, covered with minute fibres: radical leaves 2, narrowly lanceolate,

acuminate both ways, glabrous, 3-nerved, including the petiole 4 to 5 inches long, half inch broad: stems a foot or more in height, smooth or somewhat pubescent: scales oblong-lanceolate, sharply acuminate: floral bracts ovate to elliptic-lanceolate, acuminate, 4 to 6 lines long, about equalling the ovary: spike many-flowered, 4 to 7 inches long; lower flowers sometimes scattered; the upper imbricated; perianth nodding; sepals narrowly oblong, obtuse, 3-nerved, 2 lines long, not noticeably decurrent upon the ovary; lateral petals spatulate, obtuse, 1-nerved, equalling the sepals; labellum shortly unguiculate, oblong, obtuse, 2 lines long; the blade shortly and inconspicuously auricled at the base; margin slightly wavy, inflexed near the apex; callosities 2, two-thirds the length of the labellum, bright red: fruit 5 lines long.—Collected by C. G. Pringle, chiefly under *Arbutus*, in cool porphyritic gravel, Sierra Madre, Chihuahua, October, 1887 (No. 1373); and on dry ledges under firs, Sierra de las Crucis, 20 August, 1892 (No. 5326). Mr. Pringle's two plants differ only in the fact that in the first mentioned the stem and inflorescence is sparingly pubescent, in the other quite glabrous.

SISYRINCHIUM ALATUM Hook. var.? ANGUSTISSIMUM. Erect 1½ feet high: root a cluster of elongated tough fibres somewhat thickened below: stems scarcely at all flexuous, only 1 to 1½ lines in breadth: cauline leaves 4 to 12 inches long, 1½ to 2 lines broad, erect: flowers and fruit as in the typical form but spathes more slender.—Collected by C. G. Pringle, on the Sierra de San Felipe, altitude 9,500 feet, 22 June and 29 August, 1894 (No. 4703). The tall slender erect stems and narrow elongated leaves are so different from the original form of the species that the present plant would have appeared distinct but for the occurrence of a good intermediate in Mr. J. Donnell-Smith's No. 1297 from Guatemala, and the well known polymorphous character of the species.

SISYRINCHIUM EXALATUM. Erect, 1½ to 2 feet or more in height: root a cluster of long stout but scarcely tuberous fibres; stem terete, smooth, 3–5-leaved, ending in several dichotomous flexuous branches, subtended by linear-lanceolate bracts: leaves linear attenuate; the outermost basal 2 to 4 inches long, 2 lines broad, flat; the inner basal and lower cauline elongated, 8 to 18 inches long, 2 to 3 lines broad; the upper shorter, bractlike: clusters of flowers solitary, terminal on the branches, 3–5-flowered; outer spathes 14 to 22 lines long, exceeding the inner: perianth golden yellow; the outer divisions obovate, short-acuminate, about 4 lines long, 2 lines broad; the inner slightly smaller: filaments united for about a third of their length; anthers oblong-linear, about 3 lines in length: young capsule pubescent, short-obovoid, 3 lines long.—Collected by L. C. Smith on the Cuilapan Mountains, Oaxaca, altitude 7,000 feet, 27 June, 1894 (No. 52).

SISYRINCHIUM POLYCLADUM. Tall, much branched and very leafy above, 1½ feet high, drying green: root fibres numerous, 2 to 4 inches long, fusiform-thickened near the ends: stems erect,

rather slender, nearly terete and leafless up to the first fork: branches flattened and narrowly winged, scarcely a line in breadth, flexuous, several times forked: radical leaves 6 to 8 inches long, a line wide, surrounded at the base by fibres of decayed leaves; cauline leaves 2½ to 4 inches long, 1½ to 3 lines broad, often falcate: spathes solitary, terminal upon the ultimate divisions of the branches, 2(–3)-flowered, 8 to 10 lines long, slender and not ventricose: flowers 8 lines in diameter, yellow, exserted upon slender pedicels: divisions of perianth elliptic: stamens connate only at the base: capsule shortly obovate-oblong, somewhat triquetrous, puberulent when young but quite glabrate, at maturity nearly 4 lines in length.—Collected by C. G. Pringle, on rocky banks, Sierra de San Felipe, Oaxaca, altitude 7,500 feet, 11 September, 1894 (No. 4902).

NEMASTYLIS DUGESII Watson, Proc. Am. Acad. xxiv, 86. Add syn. *N. flava* Robinson, ibid. xxix, 323. Dr. Watson's species, described from drawings and somewhat fragmentary material, was not at once recognized upon its subsequent collection in more perfect specimens.

HECHTIA PRINGLEI. Leaves fifteen or twenty, clustered at the base, linear-oblong from an ovate base, spinose-tipped and pungent, about 8 inches long, remotely serrate with firm curved reddish spines; margins repand and in dried state involute; both surfaces but especially the upper argenteous, scurfy: stem 2 to 4 feet high, half inch thick, simple, scape-like: panicle a foot in length, cylindric, mealy-puberulent: bracts attenuate from an ovate base: rhachis flexuous, branches numerous, mostly simple, spike-like, ascending or somewhat flexuous and more or less spreading: bractlets ovate, acute, erose, each subtending a single flower: the ♂ flowers subsessile, outer divisions of the perianth ovate-rotund, 3-nerved, scarious-margined, somewhat puberulent on the outer surface, a line long, the inner a third longer, elliptic-oblong, obtuse: anthers slightly exserted, apiculate: ♀ flowers sessile; outer divisions of perianth deltoid, acuminate; the inner longer, lanceolate, attenuate.—Collected by C. G. Pringle, on the east side of the valley of Oaxaca, abundant, sometimes growing in patches or masses, May, 1894 (No. 4637).

DIOSCOREA CAPILLARIS Hemsl. Specimens corresponding in all essential points to Hemsley's description of this species, have been collected by Mr. Pringle, at El Parian, Oaxaca; altitude 5,000 feet, 3 October, 1894 (No. 5700), and on dry ground in the Sierra de San Felipe, altitude 7,000 feet, 11 October, 1894 (No. 5829). In the latter locality the hitherto undescribed fruit was secured, furnishing the following supplementary characters: fertile spikes simple, 1 to 4 inches long; capsules deflexed, elliptical, 6 to 7 lines in length, half as broad, tipped with the persistent styles and stigmas.

DIOSCOREA CONVOLVULACEA Cham. and Schlecht. Specimens agreeing well in other respects with this species but having very large flowers (5 lines in diameter) were secured by Mr. Pringle

on the Sierra de San Felipe, Oaxaca, altitude 7,500 feet, 13 August, 1894 (No. 5672). The segments of the perianth are deep purple, almost black, but sometimes tipped with yellow.

ANTHERICUM LEUCOCOMUM. Root-fibers numerous, long, simple, enlarged and fusiform near their ends: base of the stem surrounded by persistent fibrous remains of earlier leaves: radical leaves 8 to 12, lance-linear, 3 to 4 inches long, 3 to 4 lines broad, acute, entire, narrowed at the base, conspicuously and densely white-pilose upon both surfaces, 13–15-veined; margins ciliated: stem somewhat compressed, pilose at least toward the base, leafless, 6 inches to a foot high: bracts scarious, attenuate, the lower 6 to 8 lines long: inflorescence a simple or branched raceme, 1½ to 8 inches long: pedicels 2 to 4 lines long, articulated in the middle: flowers usually 3 in each bract; perianth yellow; divisions oblong-lanceolate, acute, 3-nerved, 6 lines long: filaments smooth: capsule short-oblong, 3½ lines in length, glabrous. —Collected by C. G. Pringle, in Oaxaca, 1894 (No. 4783), and by L. C. Smith, at Cuilapan, Oaxaca, altitude, 6,000 feet, 27 June, 1894 (No. 63).

SCHŒNOCAULON TENUIFOLIUM. *Veratrum tenuifolium* Mart. and Gal., Bull. Acad. Brux. ix, 380 (reprint, p. 9). *Asagræa? tenuifolia* Kunth, Enum. iv, 700. This species, now rediscovered by Mr. Pringle, proves quite distinct from *S. officinale* Gray, with which it has been united by recent authors. The original description may be supplemented as follows: Caudex erect, cylindrical, 4 to 10 inches long, surrounded by a dense envelope of dark fibers: leaves linear, attenuate, 2 feet or more in length, 3 lines in breadth, smooth upon the surfaces, obscurely or obsoletely denticulate, about 11-nerved: naked scape 6 to 8 inches high, terete, smooth: inflorescence dense, 3 to 4 inches long: bractlets broadly ovate, obtuse, scarious, shorter than the sessile flowers: divisions of the perianth obovate or sub-rotund, 7–9-nerved, green tipped with red, 2¼ lines long; margins erose: fruiting spike very broad, 2 inches in diameter, fertile only near the base: valves 6 to 8 lines long.—Collected by C. G. Pringle, on summit ridges, Sierra de San Felipe, Oaxaca, altitude 10,200 feet, 22 May (in flower) and 21 August (in fruit), 1894 (No. 5857).

III. *A Synoptic Revision of the Genus Lamourouxia.*

LAMOUROUXIA HBK. (Dedicated to *J. V. F. C. Lamouroux*, professor of natural history at Caen, born 1773, died 1825.)—Calyx campanulate, 4-cleft; segments subequal or connate in pairs (in one species the ventral cleft much deeper than the others, giving the calyx a unilateral and spathe-like form). Corolla long, much exceeding the calyx; throat elongated and more or less ventricose, laterally compressed; limb bilabiate; posterior lip erect, somewhat galeate, entire or emarginate; the lower usually shorter, ventricose, 2-plicate and with 3 small more or less spreading lobes. Stamens 4, didynamous, usually included and ascending under the galea, rarely exserted, all fertile or the posterior pairs with reduced sterile or obsolete anthers; fertile anthers contiguous or sometimes coherent in pairs, densely woolly; cells distinct, parallel or oblique, often calcarate at the base. Style undivided; stigma terminal. Capsule ovoid, loculicidal; valves entire, with central placentæ. Seeds very numerous, small, minutely roughened or reticulated. —Chiefly perennial herbs exclusively of subtropical and western tropical America, extending from Northern Mexico to Peru, growing chiefly upon the mountains and at middle altitudes. Habit erect, decumbent, or rarely somewhat scandent. Leaves opposite, entire, dentate, serrate, crenate, or in one species dissected. Flowers orange to crimson, showy, spicate- or racemose-paniculate, or somewhat corymbous.—Nov. Gen. et Spec. ii, 335, t. 167–169; Benth. in DC. Prodr. x, 539.

§ 1. EUPHRASIOIDES Benth. l. c. Fertile stamens 4, equal or nearly so: a very rudimentary fifth sometimes present.

* Leaves bipinnatifid.

1. L. MULTIFIDA HBK. Perennial, well-marked in the genus by its dissected foliage, scabrous-puberulent to densely and somewhat glandularly pilose: base a small woody tuber: flowers in the typical form 12 to 16 lines in length.—HBK., l. c., 339. *L. laciniata* Mart. and Gal., Bull. Acad. Brux. xii. 2, 32 (incl. var. *pilosa*, the commoner form).—Common at moderate altitudes (2,500 to 8,000 or even 11,000 feet), throughout Central and Southern Mexico to Guatemala; San Luis Potosi, *Parry* and *Palmer*, 687; Jalisco, *Pringle*, 2833; Valley of Mexico, *Bourgeau*, 612; Mexico, without locality, *Graham;* Chiapas, *Ghiesbrecht*, 704; Guatemala, Pl. Guat. *Donnell-Smith*, 813, 4013; Orizaba, *Seaton*, 134; Sierra de San Felipe, Oaxaca, *Pringle*, 4829, and *Nelson*, 1098, 1798.

VAR. GRANDIFLORA Benth. Flowers considerably larger, becoming 2 inches in length.—Benth., l. c., 540. *L. grandiflora* Benth., acc. to Linden, Cat. n. 10 (1855), 6.—Jalisco, *Hartweg*,

187; State of Mexico, *Pringle*, 3149; Guanajuato, *Dugès*, 385. Intermediate forms passing to the type are represented by *Ghiesbrecht's* 84 from Chiapas and his unnumbered specimen from the Plateau of Mexico, as well as by *Coulter's* 1356, without exact locality.

* * Leaves serrate, crenate, or entire.

+– Anther-cells conspicuously calcarate at base.

++ Calyx-teeth subulate: leaves entire or nearly so.

2. L. LONGIFOLIA Benth. Calyx 5 to 7 lines long: leaves oblong-linear, attenuate at both ends, acute, the larger 2 inches long, 1½ to 2½ lines broad; margins recurved.—Pl. Hartw. 22, and in DC. Prodr. x, 540.—Northwest Mexico in the Sierra Madre, *Seemann;* Jalisco near Balaños, *Hartweg*, 188.

3. L. HYSSOPIFOLIA Gray. Calyx 3 to 4 lines long: leaves mostly shorter and broader, oblanceolate to spatulate, acute or obtusish, 9 to 18 lines long, 2½ to 3½ lines broad.—Proc. Am. Acad., xxi, 404.—Southwestern Chihuahua, *Palmer*, 266.

++ ++ Calyx-teeth oblong, obtusish: leaves serrate.

4. L. PRINGLEI. Tomentulose, 3 to 5 feet high, branched from a somewhat ligneous base: stems terete: leaves elliptical, obtuse, 4 to 9 lines long, nearly half as broad, obtusely serrate from the middle, narrowed and shortly petiolate at the base: racemes several, rather dense; pedicels only a line or two in length: flowers 2 inches or more in length.—Garden and Forest, viii, 275, t. 39.—On cold ledges of Sierra de San Felipe, altitude 10,000 feet, 25 September, 1894, *Pringle*, 4927; and near Tamazulapam, altitude 7,800 feet, 13 November, 1894, *Nelson*, 1953.

+– +– Anther-cells obtuse or acute at base, but not distinctly spurred: leaves serrate.

++ Flowers small: corolla 7 to 10 lines long.

5. L. BREVIFOLIA Benth. Pubescent throughout: flowers subsessile.—Benth. in DC. Prodr. x, 540.—Chachapoyas, Peru, *Mathews*, 3138.

6. L. PARVIFLORA Hemsl. Glabrous or glabrate: flowers short-pediceled.—Biol. Cent.-Am. Bot., ii, 465. "Mexico, without locality, *Tate*, 31, *Mairet*, 56."

++ ++ Flowers larger; corolla 14 lines to 2½ inches long.

= Calyx very irregular, deeply cleft anteriorly: lobes lanceolate, usually acute.

7. L. XALAPENSIS HBK. Calyx slender, spathe-like, 6 to 8 lines long: corolla 15 to 18 lines long.—Nov. Gen. et Spec., ii, 388. *L. spathacea* Benth., l. c., 539.—Jalapa, *Humboldt* and *Bonpland;* Orizaba, *Botteri*, 383, 1169. Bentham's *L. Xalapensis* of the Podromus exclusive of Humboldt's specimen may well have been the following.

= = Calyx less irregular: lobes usually broad, ovate or oblong, obtusish, or in the first linear-oblong and acutish.

8. L. EXSERTA. Puberulent: stem subtetragonal, copiously branched above: leaves narrowly lanceolate, sharply serrate, acute to acuminate, 1 to 2½ inches long, 3 to 5 lines broad, narrowed at base to slender petiole: racemes lax and secund; pedicels 2 to 4 lines long: calyx glabrous, 4 to 6 lines in length; the lobes narrowly oblong: corolla 1 to 1½ inches long, densely pubescent: stamens conspicuously exserted.—Valley of Mexico, *Bourgeau*, 986, *Schaffner*, 367; and in rich ravines of Sierra de Clavellinas, Oaxaca, altitude 9,000 feet, 18 October, 1894, *Pringle*, 4995; also on top of Sierra Madre near Chilpancingo, altitude 9,000 to 10,200 feet, 24 December, 1894, *Nelson*, 2216, and at Tlalixtaquilla, *Nelson*, 2261.

9. L. DEPENDENS Benth. Hirsute: leaves ovate-lanceolate: calyx-lobes broad and often serrate: flowers rather long-pediceled, 1½ inches long: flowering branches pendulous.—Benth., l. c., 539.—"Guatemala, *Skinner*." *Ghiesbrecht's* 74, 173, 176, and 706 from Chiapas may be doubtfully placed here, and *J. Donnell-Smith's* 2162, which we have not seen, has also been referred to this species.

10. L. MACRANTHA Mart. and Gal. Pubescent with soft spreading articulated hairs: stem rather stout, erect from a somewhat decumbent base: leaves ovate, subsessile, doubly and rather deeply crenate-serrate, obtuse: racemes erect: calyx-lobes entire: corolla 2½ inches long, red dorsally and yellow ventrally: stamens not produced beyond the galea.—Bull. Acad. Brux., xii, 2, 32. *L. betonicæfolia* Benth., l. c.—South Mexico, 7,500 to 10,200 feet altitude, on Sierra de San Felipe, Oaxaca, *Pringle*, 4854, *Nelson*, 1070, 1343. Originally collected in Orizaba by *Galeotti*.

11. L. OVATA Mart. and Gal., l. c., 33. Similar to the last, but with flowers much shorter, 1¼ to 1½ inches long: inflorescence more leafy: calyx-lobes more or less serrulate.—Oak woods, Sierra de San Felipe, Oaxaca, *Pringle*, 4762; in neighboring locality, *Nelson*, 1118. Originally collected in the same general region by *Galeotti*, 989.

§ 2. HEMISPADON Benth. Fertile stamens only 2, or the posterior pair at least much shorter and with reduced anthers.

* Leaves ovate or oblong, broad at base, sessile or nearly so; Mexican and Central American species.

+ Some or all of the calyx-lobes serrate.

12. L. RHINANTHIFOLIA HBK. Leaves very sharply and doubly serrate: flowers not densely aggregated: tube of the calyx short, campanulate, obscurely 2-3-nerved at each sinus.—Nov. Gen. et Spec., ii, 337, t. 169.—Common: San Luis Potosi, *Schaffner*, 750; *Parry* and *Palmer*, 686; Valley of Mexico, *Bourgeau;* Zimapan, *Coulter*, 1357; Orizaba, *Seaton*, 464; State of Mexico, *Pringle*, 5335; Guanajuato, *Dugès*, 387; Oaxaca, *Pringle*, 4661;

Nelson, 1040, 1131. *Andrieux'* 158, from Gonocatepec, referred by Hemsley to *L. viscosa*, has the pubescence, serrulate calyx-lobes, and elliptical rameal leaves of the present species, of which it is probably only a small and more densely-flowered form.

+– +– Calyx-lobes entire: corolla tubular, scarcely ventricose.

++ Inflorescence loose.

13. L. SMITHII. Habit of the preceding: leaves of the stem ovate, sharply serrate, acute, somewhat larger, 2 inches long, an inch broad; the rameal ovate, subcordate, sessile, not elliptical and shortly petiolate as in the preceding: inflorescences considerably branched: calyx-tube short-cylindrical, 3 lines long; lobes lanceolate, acute, entire, about equal in length; nerves from the sinuses distinct, single or double: corolla 2 to 2¼ inches long.—Mountains of Jayacatlan, Oaxaca, altitude 5,000 feet, 13 August, 1894, *L. C. Smith*, 155.

++ ++ Inflorescence dense.

14. L. VISCOSA HBK. More or less glandular-tomentose: stem rather rigid, terete: leaves ovate-oblong, thickish, sharply-serrate. —HBK. l. c., 338. *L. cordata*, Cham. and Schlecht. Linnæa, v, 103. *L. coccinea*, Gray, Proc. Am. Acad., xxi, 404 (only a less pubescent form).—One of the commonest species throughout the whole length of Mexico; Sonora, *Lloyd*, 437; Chihuahua, *Palmer*, 258; *Pringle*, 656; Jalisco, *Palmer*, 578; *Pringle*, 2133, 2339; Zacatecas, *Hartweg*, 189; Huasteca, *Ervenberg*, 112; Zimapan, *Coulter*, 1358; Orizaba, *Bourgeau*, 2424; *Bilimek*, 285; *Botteri*, 86, 149; *Seaton*, 135; Oaxaca, *Pringle*, 4879; *Nelson*, 1199, 1245; Chiapas, *Ghiesbrecht*, 96, 703; Guatemala, *J. Donnell-Smith*, 4016; Mexico without locality, *Sumicrast.* So far as the characterization shows, *L. Viejensis* Oerst., Vidensk. Meddel. Kjöben., 1853, 28, from Nicaragua is also the same.

* * Leaves lanceolate, narrowly oblong, elliptical or linear, narrowed at the base, and often petioled.

+– Posterior filaments bearing reduced villous anthers.

++ Corolla short for the genus, 8 or 9 lines long: leaves incisely serrate: species of Ecuador.

15. L. SUBINCISA Benth. "Habit of *L. brevifolia:* leaves lanceolate, an inch or less in length."—Benth. l. c., x, 540.—Andes of Quito, *Jameson.*

++ ++ Corolla longer, an inch or more in length.

= Calyx-lobes serrulate.

16. ? L. SYLVATICA HBK. "Somewhat twining: leaves lanceolate, acute, narrowed at base: corolla roseate."—HBK. l. c., ii, 337.—Near Ayavaca, Peru, *Humboldt* and *Bonpland.* A very

dubious species, founded upon imperfect material, but, if correctly described, belonging here.

= = Calyx costate; segments entire.

a. Mexican species.

17. L. TENUIFOLIA Mart. and Gal. l. c. Stem copiously branched above; branches simple, slender, ascending, very leafy: leaves narrow, lance-linear, 6 to 10 lines long, crenate-serrulate; margins recurved: inflorescence dense.—Walpers, Rep. vi, 652. *L. linearis*, Benth. l. c., x, 541.—Valley of Mexico, *Bourgeau*, 1113; *Schaffner*, 368; Chiquihuite, *Bilimek*, 284; Tula, *Berlandier*, 1261; San Luis Potosi, *Parry* and *Palmer*, 673. Originally collected in E. Oaxaca by *Galeotti*.

b. South American species.

18. L. VIRGATA HBK. Leaves linear-lanceolate, sharply but finely serrate: calyx-lobes lanceolate, acute, longer than the tube.—HBK. l. c. ii, 336, t. 167.—Near Quito, *Humboldt* and *Bonpland*, *Hall*, *Jameson*, *Hartweg*, *Couthouy*.

19. L. LOXENSIS Benth. Leaves linear-lanceolate: segments of the calyx scarcely longer than the tube.—Pl. Hartw. 147, and in DC. Prodr. x, 541.—Mountains of Loxa, United States of Columbia, *Hartweg*, 824. A doubtful species, intermediate between the preceding and following.

20. L. SERRATIFOLIA HBK. Leaves linear-lanceolate, conspicuously and incisely serrate with short divergent teeth.—HBK. l. c. ii, 336, t. 168.—Near Bogota, *Humboldt* and *Bonpland*, *Goudat*.

+- +- Posterior filaments glabrous at the summit and anantherous or nearly so.

++ Leaves quite entire.

21. L. INTEGERRIMA Donnell-Smith. Nigrescent in drying: leaves narrowly lanceolate, attenuate at both ends, ¾ to 1½ inches long, 1½ to 2½ lines wide, conspicuously 1-nerved; veins very obscure: calyx indistinctly 8-costate.—Bot. Gaz. xiii, 189.—Pansamala, Alta Verapaz, Guatemala, altitude 4,000 feet, *von Tuerckheim* (Donnell-Smith's Pl. Guat.), 1112.

++ ++ Leaves serrate, serrulate, or crenate.

= Leaves an inch or more in length.

22. L. LANCEOLATA Benth. Whole plant nigrescent in drying: branches divaricate: leaves narrowly lanceolate, finely, sharply and irregularly serrate, 1 to 1½ inches long, 1½ to 2½ lines wide: calyx conspicuously 12-costate; segments linear-lanceolate, acute, spreading or even reflexed.—Benth. in DC. Prodr. x, 542.—South Mexico, Chiapas, *Ghiesbrecht*, 144, 705; Guatemala, *Donnell-Smith's*, 398, 3100.

23. L. NELSONII. Pubescent, drying green: leaves thin, oblong, acute, irregularly dentate, the larger 2 to 3 inches in length, 4 or 5 lines broad: calyx pubescent, not distinctly ribbed, 6 lines long: segments lanceolate, acute, erect: corolla over 2 inches long, red, paler and yellowish toward the base.—Six miles above Dominguillo, Oaxaca, altitude 4,500 to 5,000 feet, 30 October, 1894, *Nelson*, 1833.

= = Leaves half inch or less in length.

24. L. MICROPHYLLA Mart. and Gal. Leaves oblong, crenate-serrulate, 3–4 (–6) lines long, a line broad; those of the branches reflexed: calyx glabrous; teeth very short.—Bull. Acad. Brux. xii, 2, 31. *L. parvifolia*, Benth. l. c. x, 542.—Oaxaca, *Galeotti*, 1005; and on granitic hills at base of Sierra de Clavellinas, altitude 6,000 feet, *Pringle*, 6000.

25. L. GUTIERREZII Oerst. Shrub, 3 to 4 feet high, somewhat scandent: leaves lanceolate-elliptical, 6 to 10 lines long, 2 lines broad, somewhat scabrous: calyx somewhat villous, teeth much shorter than the tube, and (from figure of Seemann) entire.—Vidensk. Meddel. 1853, 29. *L. scabra* Benth. in Seem. Bot. Herald, 177, t. 33.—Mountains between Cartago and Candelaria, Costa Rica, *Oersted;* Volcano of Chiriqui, Veraguas, *Seemann.*

This species in the Index Kewensis is incorrectly said to be Venezuelan. Bourgeau's 101, referred hither by Hemsley, is *L. rhinanthifolia.*

26. L. GRACILIS. Scarcely shrubby, 1 to 1½ feet high: stems slender, terete, puberulent in lines: leaves elliptic-oblong, obtuse, narrowed at the base to short slender petioles, crenate-dentate, thin, not at all rugose, nearly or quite smooth, the larger ones 9 lines long, 3 lines broad: racemes simple, rather loose, leafy to the apex: segments of the calyx ovate-oblong, obtuse, nearly always crenate-dentate: corolla 1¼ to 1½ inches long, red with yellowish throat, moderately ventricose.—Summit of Sierra Madre near Chilpancingo, Guerrero, altitude 9,000 to 12,000 feet, 24 December, 1894, *Nelson*, 2234.

The following distributed as species of *Lamourouxia* belong elsewhere:

Mandon's 479 = *Gerardia* sp.
Bang's 543 = *Gesnera* sp.

IV. *Miscellaneous New Species.*

UNONA PANAMENSIS Robinson. A small tree, 15 to 20 feet high: branches brown with lighter colored lenticels; the young parts finely rufous-tomentose with simple hairs: petioles a line or two in length: leaves oblong or elliptic, shortly acuminate, somewhat narrowed at the base, entire, 4 to 8 inches long, about a third as broad, glabrous above, covered beneath especially upon the veins with an appressed rufous silky pubescence: peduncles opposite the leaves, rather short, 4 to 6 lines in length, bearing at the summit a suborbicular cordate bract half inch in diameter (rarely larger and more like the leaves, rarely absent) and 1 or 2 elongated curved pedicels, slightly thickened near their summits and 3 to 3½ inches long: calyx-segments ovate-triangular, a line in length: petals 6, equal, lance-linear, nearly erect, finely pubescent upon the outer surface, minutely granulated within, 6 to 8 lines long; the edges revolute; the tips incurved: maturing carpels 5 to 12, oblong, a little over half an inch in length, 5 lines in diameter, very slightly torulous, rounded at each end; stipe slender, 3 to 4 lines long: seeds about 6, disk-shaped.—Collected by Sutton Hayes in woods near Gatun Station on the Panama Railway, 30 July, 1860.

UNONA BIBRACTEATA Robinson. Branchlets light brown, nearly or quite glabrous: leaves lance-oblong, narrowed to an obtuse apex, contracted below to a very short thickish petiole, green and glabrous upon both surfaces, 2¼ to 3 inches long, an inch in breadth, firm but not coriaceous in texture: peduncles opposite the leaves, bearing two very unequal suborbicular cordate bracts; the lower one a third to half inch, the upper only a line in diameter; pedicel recurved, slender, about an inch in length: segments of the calyx ovate, 2 lines in length: petals linear-oblong, obtusish, 8 lines in length: maturing carpels about 15, glabrous, two-seeded, 4 lines long, 3 lines in diameter, subtruncate at apex and base, somewhat constricted in the middle; stipes slender, 3 lines in length; seeds disk-shaped, 1½ lines thick. —Collected by Charles Wright in Nicaragua upon the U. S. North Pacific Exploring Expedition in 1855.

The only other *Unona* reported from Central America, the rather doubtful and imperfectly described *U. violacea* Dunal, has according to the original figure in Dunal's monograph a considerably larger flower with broader petals and no bracts. All efforts to identify the two species here described with those of the Old World have failed and their occurrence does not suggest an introduced character.

MALVAVISCUS PRINGLEI E. G. Baker. Caule ligneo, foliis membranaceis viridibus cordatis acute palmate-5-lobatis, lobo medio majore, præcipue junioribus utrinque stellato-pubescentibus serratis petiolatis, floribus maximis axillaribus solitariis vel ad extremitatem ramulorum subracemosis, bracteolis ligulatis calyce brevioribus, sepalis triangularibus vel ovatis acutis intus margine

cinereo-pubescente, columna staminea exserta petalorum longitudinem dimidio excedente, carpellis nigrescentibus vel subnigrescentibus superne in medio sulcatis inferne carinatis.—Collected by C. G. Pringle, on rocky hills bordering Lake Cuitzeo, Michoacan, 20 July and 26 October, 1892 (No. 4132). Stem 10 to 20 feet high, woody, younger branches at the extremities covered with a scurfy cinereous pubescence. Leaves membranous, green, cordate; palmately 5-lobed, middle lobe longest, serrate, pubescent on both surfaces especially the young leaves, length of leaves on specimen 3–3½ inches, breadth 3–4 inches, petioles 1½–3 inches long covered with cinereous pubescence. Flowers axillary, solitary or at the end of the branches somewhat racemose. Bracts strapshaped, half inch long, shorter than the sepals. Calyx three-fourths inch long, sepals triangular or ovate, acute, inside the margin cinereous-pubescent. Petals convolute, 2¾ inches long. Stamineal tube exserted 1½ inches. Styles 10, capitately stigmatose. Fruiting peduncles straight, stiff, terete, generally slightly bent just below the fruit. Carpels 5, black or brownish, black on the back, grooved above, the groove gradually passing into a ridge below, third inch long.

This plant was distributed as *Malvaviscus acerifolius* Presl, of which there is a specimen gathered by Hænke in Mexico in the Herb. Mus. Brit. *M. Pringlei* differs from *M. acerifolius* Presl, in its leaves, bracts and flowers. The leaves are much deeper lobed in the former than in the latter and in *M. Pringlei* the bracts are shorter than the calyx and the petals nearly 3 inches long; in *M. acerifolius* the bracts are the same length as the calyx and the petals an inch long. *M. Pringlei* differs from *M. cinereus* Bak. fil. MS. in the texture of its leaves and its much larger flowers. I have named this very showy plant in honor of Mr. C. G. Pringle, who has done so much to further our knowledge of the Mexican flora.

Laphamia Toumeyi Robinson and Greenman. Many-branched from a knotted woody base, densely glandular-puberulent; branches about 4 inches long, erect, terete, striated, simple or again branched, rather cinereous: leaves spatulate, including the petioles 3 to 5 lines long, a line to a line and a half broad; entire, obtuse, thickish, cinereous; the petiole channelled above; heads discoid, 2½ to 3 lines high, equally broad, about 35-flowered, terminal upon the branchlets, together forming a pyramidal or subcorymbous inflorescence; involucral scales sub-biseriate, nearly equal, acute, the outer thickish, carinate, densely puberulent, the inner thinner and flatter: pappus of a single awn: tube of the corolla glandular-pubescent: achenes compressed, oblong-linear, about a line long, puberulent.—Collected by Prof. J. W. Toumey, in the Grand Cañon, 12 July, 1892 (No. 645).