

SCROPHULARIACEÆ.

Maurandia antirrhina, Lindl. On the San Francisco, a tributary of the Gila. A slender trailing plant, with beautiful purplish flowers.

Castilleja linearifolia, Benth. Valley of the Gila, and the region between that river and the waters of the Gila.

Penstemon Torreyi, Benth. Region between the Del Norte and the Gila.

Three or four other species of *Penstemon* exist in the collection, but the specimens are incomplete, and have not yet been studied.

VERBENACEÆ.

Verbena bipinnatifida, Nutt. Valley of the Del Norte.

Lippia cuneifolia, Steud. *Verbena cuneifolia*, Torr. In Long's Rocky Mountain plants. Upper part of the Arkansas, and along the tributaries of the Canadian.

LABIATÆ.

Salvia carduacea, Benth. Western slope of the Cordilleras of California.

Another species of this genus was found with the preceding, but not in flower. It is entirely clothed with dense soft canescent pubescence. It is shrubby, with long stout branches springing from near the root. The leaves are oblong, coriaceous, entire, and two inches or more in length.

Several other undetermined labiatæ were found in the valley of the Del Norte and on the Gila.

BORAGINACEÆ.

Myosotis glomerata, Nutt. Tributaries of the Canadian.

Euploca grandiflora, n. sp. Hirsute, with rough appressed hairs. Leaves oblong-lanceolate, on short petioles. Flowers in leafy clusters. Calyx five-paired to the base, with linear lanceolate segments. Corolla white; (the expanded limb nearly three-fourths of an inch in diameter, obscurely 5-lobed, plaited; tube slender, somewhat ventricose below the middle; the throat naked. Stamens inserted toward the base of the corolla tube; the filaments short; anthers oblong-linear. Ovary 4-celled, style filiform, persistent, arising from the summit of the ovary; stigma capitate, with a tuft of stiff hairs at the extremity. Fruit 4-celled, 2-lobed, finally separating into indehiscent carpels; embryo curved, terete, surrounded with very thin albumen; radicle superior. On the Del Norte below Santa Fé. This plant is clearly a congener of *euploca convolvulacea* of Nuttall. It is nearly related to *Tournefortia*.

HYDROLEACEÆ.

Eriodictyon, Benth. in bot Sulph., p. 35. Chois in DC, prod. 10, p. 183. A well characterized Californian genus, containing three described species, one of which is the *Wigandia Californica*, Hook and Arn, which was found in rocky places near the mouth of San Carlos, on the Gila, and on the Cordilleras of California. The leaves are coriaceous, varying in form from narrowly linear to lanceolate, and from being perfectly entire to strongly dentate. The upper surface (as well as the branches,) is covered with a copious adhesive varnish, while the under-side is whitish tomentose, with strongly marked reticulated veins.

POLEMONIACEÆ.

Phlox, n. sp. This likewise occurs in Texas, and will be described by Dr. Gray. It was found in various places on the tributaries of the Canadian.

Gilia pulchella, Dougl. Ocaté creek, and other tributaries of the Canadian.

G. longifolia, Benth. *Ipomœa longifolia*, Torr. In Long's Rocky mountain plants. Valley of the Del Norte.

Fouquieria spinosa. (*Bronnia spinosa*, Kunth. nov. gen. 6, p. 84, t. 528.) Benth. in bot. Sulph. p. 16. Ascending the Cordilleras of California. A highly ornamental shrub, shooting up long smooth simple stems, to the height of from 12 to 25 feet, with a panicle of scarlet flowers at the summit. It differs slightly from the figure and description of Kunth, but seems to be the same plant. The leaves are obovate-oblong, glabrous and membranaceous, grown in fascicles in the axils of the spines. The spines are from a half an inch to near an inch in length, slender, more or less spreading, or even somewhat recurved. At the base of each is a longitudinal protuberance which extends along the stem until it reaches the spine, which is on a line with it below. The panicle is usually contracted and elongated, but sometimes short, and almost corymbose. The flowers are on short pedicels which are furnished with deciduous bracts. Sepals 5, nearly orbicular, concave, strongly imbricated, persistent, about one fourth the length of the corolla. Corolla about three-fourths of an inch long; the tube cylindrical, and often curved; limb 5-cleft, with ovate rather acute segments. Stamens 13 to 16 exerted, hypogynous; the filaments thickened and somewhat coherent at the base; anthers linear oblong, mucronate. Ovary 3-celled, with about 6 ascending anatropous ovules in each cell, style 3, parted below the middle. Capsule oblong, acute, obtuse, triangular, coriaceous and glabrous, 3-valved, loculicidal, straight, or little curved, one-celled by the separation of the valves from the triangular axis. Seeds 3 to 6, white, ovate, pellate, much compressed, with a broad winged margin, which is an expansion of the testa, and which finally is resolved into numerous fine hairs. These are beautiful objects under the microscope. They are spiral vessels consisting of an extremely delicate sheath, containing the

loosely coiled thread which frequently ramifies with anastomosing branches. The whole testa is formed of these singular vessels. Embryo nearly as large as the seed; cotyledons foliaceous; radicle pointing downward. There can be little doubt of the propriety of uniting *Bronnia* and *Fouquieria*. Each genus was founded on a single species, and both plants seem to be very little known to European botanists. Of the former the flowers are imperfectly described, and of the latter, the fruit is unknown. Our plant partakes of the characters of both genera. In the ovary the placentæ meet in the axis, but only slightly cohere; finally they unite, but in fruit the valves of the capsule separate from the axis, to which the seeds remain attached. As to the affinities of *Fouquieria*, I am inclined to adopt the opinion of Lindley, that it is very near *Polemoniaceæ*, and particularly to *Cantua*. It differs, however, in its distinct imbricated sepals, (which are exactly those of *convolvulus*), more numerous and hypogynous stamens; and very sparing albumen, as well as in habit. It is certainly very unlike *Franke-niaceæ*, to which it is appended by Endlicher. Kunth placed it among genera allied to *Portulacaceæ*.

CONVOLVULACEÆ.

Ipomœa leptophylla, Torr. in Frém. 1st report, p. 94. Upper part of the Arkansas and head waters of the Canadian. The stems are often erect, about two feet high, and of a bushy appearance. From the appearance of the specimens, I should suppose the plant were a perennial, but according to Dr. James it is an annual.

One or two other *Convolvulaceæ* were in the collection, but I have not determined them to my satisfaction.

SOLANACEÆ.

Nycterium lobatum. Between Fort Leavenworth and the head of the Arkansas.

Datura metel, Willd.? Valley of the Gila. It grows from four to five feet high, with spreading branches. Perhaps introduced. *Solanum triflorum*, Nutt. Upper part of the Arkansas, and on the tributaries of the Arkansas.

Another species of *Solanum* was found on the Del Norte below Santa Fé. The whole plant is clothed with a dense yellowish white pubescence. The stems are rough, with minute slender prickles. Leaves linear-oblong, entire, rather obtuse, prickly along the mid-rib. Flowers, two or three together at the summit of the branches, white.? stamens 5; anthers equal.

GENTIANACEÆ.

Eustoma Russelianum, Don. Near the bank of the San Pedro. A showy plant.

Erythræa Beyrichii, Torr. and Gr. *E. tricantha* B. Griseb. Valley of the Del Norte, and along the Gila.

OLEACEÆ.

Fraxinus velutina, n. sp. Branches, petioles, and under surface of the leaves, clothed with a dense soft pubescence. Leaflets 3 to 5, rhombic ovate, cuneate at the base, coarsely serrate or toothed, sparingly pubescent above. Fruit narrowly oblanceolate, nearly entire at the apex, about three-fourths of an inch long. A small tree, usually from 15 to 20 feet high. Grows in the region between the waters of the Del Norte and the Gila; also on the Mimbres, a tributary of the latter river.

NYCTAGINACEÆ.

Abronia mellifera, Hook. Valley of the Del Norte.

A. (Tripterocalyx) micranthum, Torr. in Frém. 1st report, p. 96. Valley of the Del Norte.

This differs in some respects from Frémont's plant. The peduncles are elongated, and the fruit is more than an inch long, with very broad wings. The structure of the seed is precisely the same as in that plant, the inner cotyledon of the conduplicate embryo being abortive. It is wanting also in *A. mellifera*. In several species of this genus, if not in all of them, the filaments adhere throughout nearly their whole length to the tube of the perianth. The lobes of the perianth are dilated, and deeply emarginate, but appear ovate in the bud, from the lobules being conduplicate.

CHENOPODIACEÆ.

Sarcobatus vermiculatus, S. Maximilioni, Nees in Prince Maxim. trav., Engl. ed., p. 518. *Frémontia vermicularis*, Torr. in Frém. 1st report, p. 95; and 2d report, p. 317. *Batis vermicularis*, Hook, fl. Bor. Am. 2, p. 188. Abundant on the Del Norte, and upper part of the valley of the Gila.

This is the pulpy thorn of Lewis and Clark. It has a very extensive range in the desert regions on both sides of the mountains. Since my notices of this plant were published in Frémont's reports, I have ascertained that Nees' description of his genus, *Sarcobatus*, dates a little anterior to mine, so that his name must be adopted.

Obione argentea, Moq. *Atriplex argentea*, Nutt. Abundant in sandy saline places on the Del Norte.

O. polycarpa, n. sp. Valley of the Gila.

Eurotia lanata, Moq. Valley of the Del Norte. A shrubby *Salicornia*, an *Atriplex*, and a species of *Sueda*, were found in saline soils along the Gila.

AMARANTHACEÆ.

Amaranthus hybridus, Var.? Glabu. Stem and leaves nearly smooth, flowers (purplish) crowded in a dense compound terminal spike; bracts somewhat awned, shorter than the flowers; utricle opening transversely. On the Del Norte, below Santa Fé.

POLYGONACEÆ.

Eriogonum trichopes, *n. sp.* Stem scape-like, verticillately and divaricately much branched, glabrous; peduncles capillary; involucre minute, few flowered, glabrous, 4-toothed; the teeth nearly equal, obtuse, erect; sepals ovate, acute, nearly equal, very hairy. Eastern slope of the Cordilleras of California. Our specimens of this remarkable species are imperfect, the leaves being wanting. They probably grow in a radical cluster. The flowering stems are a foot or more high, with the primary and secondary branches verticillate; the branchlets are bi-trichotomous, and the ultimate divisions or peduncles somewhat secund. Involucre scarcely half a line in length, 5—6 flowered, and only 4-toothed. The flowers are nearly twice as large as the involucre, sepals concave, erect spreading. Stamens scarcely exerted.

E. tomentosum, *Michx.* Abundant in the region between the valley of the Del Norte and the waters of the Gila; the most western station hitherto found of this species, which is almost the only eriogonum known east of the Mississippi.

E. Aberteanum, *n. sp.* Annual? Canescently tomentose; stem dichotomous above; leaves oblong-lanceolate, attenuated to a petiole at the base; involucre solitary, somewhat racemose on the branches, pedunculate, many flowered, campanulate, deeply 5—8-parted; exterior sepals nearly orbicular, deeply cordate at the base; inner sepals narrow, carinate below, contracted above, somewhat dilated and emarginate at the summit; stamens much shorter than the sepals. Very common in the region between the Del Norte and the Gila. Also found by Lieutenant Abert on the upper waters of the Arkansas. Just as I was sending these notes to the press, I received a visit from Mr. Nuttall, who informed me that a species allied to this was found by Mr. Gambel, in his late journey to California. He thinks its characters differ so much from all the eriogona hitherto described, that he has constituted of it a new genus under the name of *EUCYCLA*. A full account of Mr. Gambel's plants, by Mr. Nuttall, will soon be published in the journal of the academy of Philadelphia. Our plant is about a foot high, with loosely paniculate branches.

The heads and flowers are nearly as large as those of *E. tomentosum*. The sepals are yellowish, tinged with rose, the three inner ones differ widely from the others; they are carinate and glandular on the back below the middle, and closely embrace the pistil, the angles of which correspond with the keels of the sepals.

Imperfect specimens of several other eriogona occur in the collection.

SAURURACEÆ.

Anemopsis Californica, *Nutt. Hook. in bot. Beechey's voy.*, p. 390, t. 92. Valley of the Gila.

EUPHORBIACEÆ.

Eremocarpus setigerus, *Benth. in bot. of Sulph.*, p. 53, t. 26. Plains of San Diego, California.

Hendecandra Texensis, *Klotzsch. H. multiflora*, *Torr. in Frém. 1st report. Croton muricatum*, *Nutt.* Valley of the Del Norte.

Another species of this genus, allied to *H. procumbens*, was found on the Cordilleras of Mexico, but the materials are scarcely sufficient for determining it satisfactorily.

Stillengia spinulosa, *n. sp.* Suffruticose? leaves rhombic-ovate, rigid, narrowed at the base, prominently 3-nerved, mucronately acuminate, dentate-spinulose on the margin; spikes axillary and terminal; sterile flowers sepale; bracts acuminate, with a stipitate gland on each side at the base. Abundant in the desert west of the Colorado. Stem (apparently) about a span high, with spreading branches. Leaves an inch or more in length, sessile, neatly margined, with spreading spinulose teeth, glabrous on both sides. Spikes numerous; with solitary fertile flowers at the base. Sterile flowers about as long as the scale. Perianth hemispherical, irregularly lobed and undulated. Stamens 2. Fertile flowers imperfect in our specimens. Fruit glabrous.

Euphorbia hernianoides, *Nutt.* Banks of the Gila. A pubescent variety of this species was found in the desert west of the Colorado.

CUPULIFERÆ.

Quercus Emoryi, *n. sp.* Leaves coriaceous, oblong, on very short petioles, remotely and repandly toothed, the serratures mucronate, smooth on both sides; fruit pedunculate, solitary and in pairs, gland ovoid-oblong, mucronate; cup hemispherical, the scales appressed. Common in the elevated country between the Del Norte and the Gila. This small leaved oak resembles *Q. agrifolia* and *Q. undulata*, (*Torr. in Ann. lyc. N. York* 2, p. 248, t. 4,) but is quite distinct from both.

SALICACEÆ.

Salix. Several narrow leaved willows were found along the Gila, and in the region west of the Colorado, but being without fructification they cannot be determined. One of them is used as food for cattle when there is no grass.

PLATANACEÆ.

Platanus Mexicanus, *Moricand pl. nouv. ou rars d' Amer.* t. 26. *P. Californica*, *Benth. bot. Sulph.*, p. 54. *P. racemosus*, *Nutt.?* Valley of the Gila.

CONIFERÆ.

Ephedra occidentalis, Willd.? From the region between the Del Norte and the Gila, and the hills bordering the latter river to the desert west of the Colorado. A shrub 3—4 feet high, with numerous slender branches; its appearance being that of Scotch broom. (*Spartium scoparium*.) The sheaths are very long, 3-parted, with subulate-acuminate segments. This can hardly be the *E. Americana* of Quito, which is described as having 2-parted sheaths. The specimens are without either flowers or fruit. If the species should prove to be new, it may be called *E. trifurcus*. There seems to be still another species growing on the table lands of New Mexico, differing from the preceding in its very short sheaths.

Juniperus. Two undetermined species were found in crossing the country from the Del Norte to the Gila. Both of them have the general character of *J. Virginiana*. One is a large tree, with acerose leaves, and a bark like that of a pinus; the other has short closely appressed leaves and berries larger than a buck shot.

AMARYLLIDACEÆ.

Agave Americana, Linn. Found in descending the western slope of the Cordilleras of California. This is the *maguey* of the Mexicans. It shoots up a flowering stalk 10 or 15 feet high. The juice of the plant affords an intoxicating drink called *pulque*.

Another species of agave, or a very remarkable variety of the preceding was found in New Mexico, west of the Del Norte. It differs from *A. Americana* in its much shorter and broader leaves, which are furnished with smaller marginal spines.

LILIACEÆ.

Yucca. The leaves only, of what appear to be four species of this genus, occur in the collection, but we cannot identify them for want of the inflorescence.

ORCHIDACEÆ.

Spiranthes cernua, Rich. Low grounds in the valley of the Del Norte.

CYPERACEÆ.

Eleocharis quadrangulata, R. Brown. Valley of the Gila.

Cyperus Michauxianus, Schultes. Valley of the Gila.

GRAMINEÆ.

Chloris alba, Presl. Spikes umbellate-fasciculate, numerous, (8—12,) the peduncle inclosed in a broad compressed sheath; spikelets 2-flowered; upper glume nearly as long as the flowers,

2-toothed, with a short awn between the teeth; lower palea of the perfect flower obscurely 3-nerved, gibbous in the middle, the margin ciliate, with long hairs towards the summit; awn three times as long as the palea; neuter flower broad and truncate, inclosing a short aristiform rudiment; the awn twice as long as the palea. Bed of the Gila. Very near *C. barbata*, which differs in the entire glumes, which are only mucronate (not awned) in the entire straight lower palea of the perfect flower, and in the third or aristiform flower, being much exserted.

Boutelona racemosa, Lagasca.? Culm erect, simple; spikes numerous (20—40) reflexed, 3-flowered, lower glume linear-nebulate; upper one linear-lanceolate, scabrous, entire, nearly as long as the spikelets; lower palea of the perfect flower unequally tricuspidate, pubescent, abortive flower reduced to a slender awn, which is nearly as long as the perfect flower, furnished at the base, with 2 short and inconspicuous bristles. Valley of the Gila, rare. This plant agrees pretty well with Kunth's description of *B. (Eutriana,) racemosa*, except in the pubescent lower palea, and the minute bristles at the base of the neuter flower. Whether it be the plant of Lagasca or not is very difficult to determine from his brief character. It certainly is very different from *B. racemosa* of the United States, which has a large 3-awned neuter flower, and if distinct from Lagasca's, must receive another name. That of *B. curtispindula* would be appropriate.

Chondrosium eriopodum, n. sp. Culm simple, pubescent below; spikes 4—6, racemose appressed; spikes on short woolly peduncles, spikelets 2-flowered; flowers distichous; glumes very unequal, glabrous, linear-lanceolate, mucronate, entire; lower palea of the perfect flower glabrous, bifid at the apex, with a short bristle between the teeth; neuter flower pedicellate, with 3 slender awns. This is one of the species of "Gramma" so useful as a fodder-grass in New Mexico. It is abundant along the Del Norte, and in the region between that river and the waters of the Gila. The culm is slender, a foot or more in height. Leaves are very narrow, 2—3 inches long, with glabrous sheaths; sessile almost wanting. Spikes about three-fourths of an inch long.

Chondrosium fœneum, n. sp. Leaves glabrous; spikes 2—3, oblong, folcate, spreading; rachis nearly half the length of the spikes; upper glume nearly as long as the perfect flower, with two rows of piliferous glands on the back; lower palea deeply 3-cleft, the segments lanceolate and mucronate, hairy on the margin; neuter flower of two truncate emarginate valves, with a 2-valved rudiment of a third flower, and 3 short stout awns. Uplands bordering the valley of the Del Norte. This is another of the grasses called *Gramma* in New Mexico, and is the best kind, being almost as good fodder as oats. It is nearly allied to *Atheropogon (Chondrosium,) oligostachyum* of Nuttall.

Chondrosium polystachyum, Benth. bot. Sulph. p. 56. Uplands bordering the Gila. The smallest kind of "Gramma" found on the journey. It is about 6 inches high, very slender. The spikes are narrowly linear, and almost half an inch long, erect, on short

brownish peduncles. The other characters agree minutely with Mr. Bentham's admirable detailed description in the work quoted above.

Leptochloa filiformis, Roem and Schults. Valley of the Gila. Scarcely distinct from *L. mucronata* of the United States.

Sesleria? dactyloides, Nutt. Upper part of the Arkansas. This is the celebrated "Buffalo grass," so called because it constitutes the chief fodder of the wild buffalo, during the season that it flourishes. I have retained this plant, for the present, where it was placed by Mr. Nuttall, who noticed its anomalous characters. It differs from *sesleria*, and indeed from the Torbe *Festucaceæ*, in its habit, which is that of *chondrosium*. The stem throws off suckers which root at the joints, from whence leaves and culms of a few inches in height are thrown up. The spikes are two or three in number, on short spreading peduncles. They are oblong, about half an inch in length, and obtuse; bearing from 6 to 8 spikelets, which are unilateral, and form a double row on the rachis. The spikelets are usually 2-flowered, but I have occasionally found them with 3 flowers, and even the rudiment of a fourth. The glumes are very unequal, oblong-ovate, coriaceous-membranaceous, carinate and one-nerved, the upper one slightly mucronate. Palea oblong-lanceolate, and somewhat keeled, membranaceous, nearly equal, but longer than the glumes, entire glabrous, except on the keel; the lower 3-nerved, the upper bi-carinate. Anthers large, linear, fulvous. In all the specimens of this collection, as well as in those in my herbarium from numerous other localities, there are no fertile flowers, and only in a few instances rudimentary styles, so that the plant seems to be diœcious or polygamous by abortion.

Arundo Phragmites, Linn. Valley of the Del Norte, and along the Gila.

Andropogon argentens, DC., Kunth. enum. t, p. 500. Valley of the Gila. A handsome species, with the spikes in a terminal panicle, which has a white appearance from the abundant silky hairs of the flowers.

A. macronus, Michx. With the preceding.

Besides these grasses, there were a few others, mostly collected in the valley of the Gila, but which I have not determined, as the specimens are not so complete as could be desired. Among them are a *glyceria*, two *agrostides*, five species of *pamquin* and a *poa*, (*eragrostis*.) with large elongated spikelets. In some parts of the valley of the Del Norte, *sorghum vulgare* is cultivated, and was found partly naturalized.

EQUISETACEÆ.

Equisetum hyemale, Linn. Lower part of the Colorado.

FILICES.

Adiantum tenerum, Swartz. Valley of the Gila. This species is widely spread over the southern part of North America, and yet

has not hitherto obtained a place in our Flora. We have it from Alabama, Florida, Texas, and various parts of California.

Lycopodium. A small species allied to *L. rupestre*, was found in descending the Gila. It differs in its incurved leaves, which are mucronate, but without a bristle at the tip. No fructification exists in the specimen.

St. Louis, February 13, 1848.

MY DEAR SIR: Your letter, together with the package containing the drawings of a number of most interesting cactaceæ, arrived safely here about two weeks ago.

O: the occasion of my report on the botany of Dr. Wislizenus's voyage, I have made a careful investigation of the cactaceæ, of which he brought home with him more than 20 species, and have been enabled to elucidate several points which had been unknown, or obscure before; no doubt because in the hot-houses of European gardens, these curious plants, though they thrive pretty well, rarely produce flowers and fruit; so that from 800 species of cactaceæ at present cultivated in Europe, perhaps not one fourth is known as to its flower, and a much smaller proportion in fruit.

I am now able to distinguish all the different genera of cactaceæ by their seed, and sometimes even the different sections of one genus.

The small black shining seed sent me, belongs to a true *cereus*, probably the plant which you mention under the name of pitahaya, the larger opaque black seed is that of an *echinocactus*, and the largest white seed is the seed of an opuntia of the section *cylindraceæ*.

I have ventured to describe some of your species from the drawing; my descriptions, however, and the names given by me, must remain doubtful till we are able to obtain some more data to characterize the species. I have written it more for your information than for publication, but if you choose to append it to your published report, I have no objection to it, but must request you to make such corrections or alterations as your notes or your recollection of the plants will enable you to do; for example, as to size, as in some of the drawings no size is mentioned,* in which case I have assumed them to represent the natural size. I have, for convenience sake, numbered the different figures, and shall now proceed to copy for you the descriptions and remarks following my numbers.

1. *Mammillaria*, October 18, 1846.

Proliferous in the highest degree, forming hemispherical masses often of a diameter of $3\frac{1}{2}$ feet; which are composed of 100—200 different heads or stems. Single heads conical, apparently about 4 or 5 inches high, and $2\frac{1}{2}$ —3 inches in diameter; color, bluish green; spines white or reddish.

* Where the size is not mentioned, the original drawings are the size of nature. W. H. E.