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EXPLORATIONS AND SURVEYS FOR A RAILROAD ROUTE FROM THE MISSISSIPPI RIVER TO THE PACIFIC OCEAN.

WAR DEPARTMENT.

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REPORT

ON THE

BOTANY OF THE EXPEDITION:

BY

JOHN TORREY AND ASA GRAY.

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ROUTE NEAR THE THIRTY-SECOND PARALLEL OF NORTH LATITUDE, UNDER THE COMMAND OF BREVET  
CAPTAIN JOHN POPE, CORPS OF TOPOGRAPHICAL ENGINEERS.

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Peter Raven

## BOTANICAL REPORT.

*Catalogue of Plants collected on the Expedition.* By JOHN TORREY and ASA GRAY.

### RANUNCULACEÆ.

CLEMATIS DRUMMONDII, *Torr. and Gray, Fl. 1, p. 9.* On the upper Colorado, Texas; April.

ANEMONE CAROLINIANA, *Walt.; Torr. and Gray, Fl. 1, p. 12; Torr. in Marcy's Rep. t. 1.* Delaware creek to the Sacramento, the Pecos, and the Colorado; March, April.

MYOSURUS MINIMUS, *Linn.* Head of the Colorado; April.

DELPHINIUM AZUREUM, *Michx. Fl. 1, p. 314.* Western Texas; April. Broad-leaved varieties.

### BERBERIDACEÆ.

BERBERIS TRIFOLIOLATA, *Moricand; Gray, Pl. Lindh. 2, p. 142.* Base of the Guadalupe mountains, New Mexico; March.

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### PAPAVERACEÆ & FUMARIACEÆ.

ARGEMONE MEXICANA, *Linn.* Western Texas; April.

CORYDALIS AUREA, *Willd.* Delaware creek to the Sacramento and Pecos; March.

### CRUCIFERÆ.

STREPTANTHUS PETIOLARIS, *Gray, Pl. Fendl. p. 7.* On the upper Colorado, Texas.

STREPTANTHUS CARINATUS, *Wright in Gray, Pl. Wright, 2, p. 11.* Rocky hills on the Pecos, New Mexico; March. Smaller specimens than Wright's, and, like those, in flower only.

GREGGIA CAMPORUM, *Gray, Pl. Wright, 1, p. 9, t. 1.* On the Pecos, &c.; March. In flower only.

SISYMBRIUM CANESCENS, *Nutt.* Delaware creek to the Colorado; March, April.

ERYSIMUM ASPERUM, *DC.; Torr. and Gray, Fl. 1, p. 95.* On the Pecos, Llano Estacado, and upper Colorado; March, April.

DITTHYRÆA WISLIZENI, *Engelm. in Wisl. N. Mex. p. 11; Torr. in Marcy's Rep. t. 2.* On the Pecos, Llano Estacado, &c.

VESICARIA GRACILIS, *Hook. Bot. Mag. t. 3533; Gray, Pl. Lindh. 2, p. 148.* On the Pecos, Llano Estacado, and upper Colorado; March, April. Except by its non-stipitate silicles, *V. angustifolia, Nutt.*, is apparently undistinguishable from *V. gracilis*; and there is some reason to fear that this difference is not constant.

VESICARIA GORDONI, *Gray, l. c., p. 149.* Llano Estacado; April. There is reason to fear that this also passes into the foregoing.

VESICARIA ARGYRÆA, *Gray, Pl. Lindh. 2, p. 146.* Between Delaware creek and the Pecos; March. Not yet in flower.

October 16, 1996



VESICARIA FENDLERI, *Gray, Pl. Fendl. p. 9*; *V. stenophylla, Gray, Pl. Lindh. 2, p. 149*. Everywhere on Delaware creek, the Pecos, Llano Estacado, &c.; March, April. To this, it is now evident, belongs the *V. stenophylla*; and the species exhibits great diversities in its mode of growth and foliage, as also in the size and even the shape of its pods. The name *V. Fendleri* is the older one; that of *V. stenophylla* is applicable only to some of the forms which the species assumes.

VESICARIA LUDOVICIANA, *DC. Syst. 2, p. 297*. On the Pecos; March. Not in flower.

DRABA CUNEIFOLIA, *Nutt. in Torr. and Gray, Fl. 1, p. 108*. Delaware creek to the Colorado.

SELENIA DISSECTA, (n. sp., Plate I.) Leaves bipinnately divided, the segments linear; style not longer than the ovary; valves of the pod imperfectly one-nerved; seeds on short and thick funiculi.—In sandy or gravelly soil, from Delaware springs to the Llano Estacado; March and April. In flower, and with some mature fruit. This second species of Nuttall's genus *Selenia* is perhaps the most interesting plant of the present collection. It is a sort of biennial, (like so many of this region,) the plant having grown from the seed the preceding autumn, and begun to flower early in the following spring. The earliest flowers, borne on slender peduncles, spring directly from the crown, among the tufted radical leaves. Later, an ascending and sparsely leafy stem rises to the height of from three to six inches, and bears a raceme of leafy-bracted flowers, in the manner of *L. aurea*. The blossoms appear to be considerably larger than in that species, at least the earlier ones, the petals being fully half an inch long; but their form, and apparently their color, is the same. The leaves are all pinnately divided, with their primary divisions pinnately 3-9-parted. The anthers are linear, rather than oblong. The style, although slender, is hardly as long as the ovary: stigma rather large, depressed. The silicle is elliptical, slightly inclined to obovate, very flat, seven to eight lines long, scarcely stipitate, rounded at the summit, and abruptly tipped with the comparatively short style; valves minutely reticulate-veiny; a mid-nerve is usually evident from the base to the middle, or sometimes even to the summit. Septum complete in the specimens examined, obscurely two-nerved in the middle; the areolæ large, and nearly as in *L. aurea*. The seeds resemble those of that species, but are borne on short and thick funiculi, the base of which is somewhat adnate to the margin of the septum; and the cœcal pouch at the hilum is small, or indistinct. Cotyledons orbicular, accumbent against the ascending radicle, which is on the side remote from the placenta. As already shown, (*in Gen. Ill. 1, p. 158*,) the genus belongs to the *Alyssineæ*.

LEPIDUM ALYSSOIDES, *Gray, Pl. Fendl. p. 10*. Llano Estacado; April.

LEPIDUM WRIGHTII, *Gray, Pl. Wright. 2, p. 15*. On the Pecos, Colorado, &c.

LEPIDUM INTERMEDIUM, *Gray, l. c.* Near Fort Washita; April.

#### CISTACEÆ.

LECHEA MINOR, *Lam.; Torr. and Gray, Fl. 1, p. 153*. On the Llano Estacado; March. Without flowers or fruit.

#### CARYOPHYLLACEÆ.

SILENE ANTIRRHINA, *Linn.* On the upper Colorado, Texas; April.

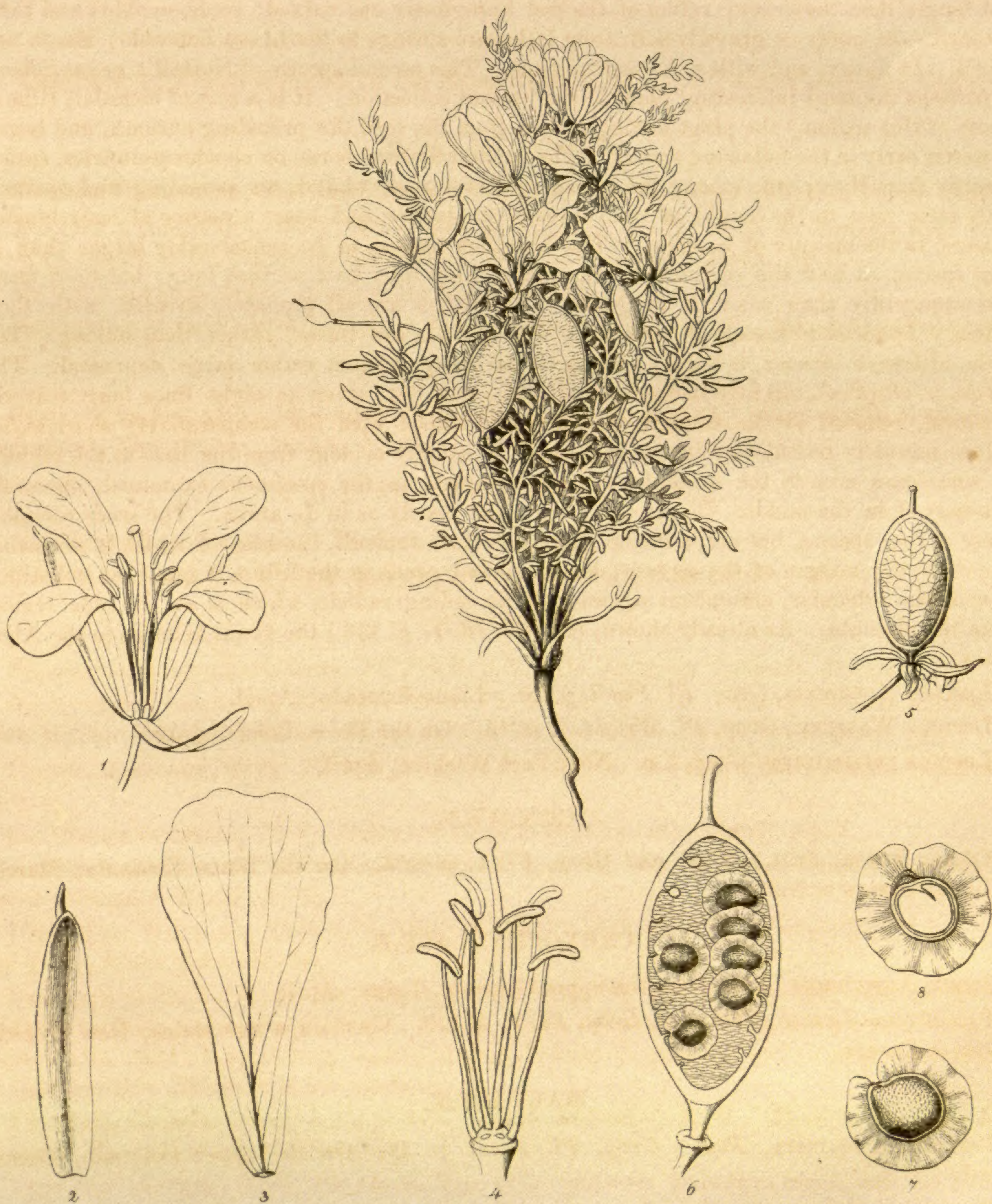
PARONYCHIA JAMESII, *Torr. and Gray, Fl. 1, p. 170*. Guadalupe mountains, New Mexico. Without flowers.

#### MALVACEÆ.

CALLIRRHÖE DIGITATA, *Nutt.; Gray, Pl. Fendl. p. 17*. On the upper Colorado, Texas; April.

CALLIRRHÖE INVOLUCRATA, *Gray, l. c.* A small variety. On the upper Colorado; April.





SELENIA DISSECTA.



MALVALTRUM COCCINEUM, *Gray, Pl. Fendl. p. 21.* Everywhere between the Rio Grande and the Colorado; March, April.

SPHÆRALCEA HASTULATA, *Gray, Pl. Wright. 1, p. 17.* On the Pecos and Colorado.

SPHÆRALCEA ANGUSTIFOLIA, *Spach*; the small flowered variety, *S. stellata, Torr.* Pecos to Llano Estacado; March.

SPHÆRALCEA FENDLERI, *Gray, Pl. Wright. 1, p. 21.* Cotton-wood Springs, New Mexico. Fruit only, without foliage.

## GERANIACEÆ.

GERANIUM CAROLINIANUM, *Linn.* From Llano Estacado to Colorado, &c.

ERODIUM TEXANUM, *Gray, Pl. Lindh. 2, p. 157; and Gen. Ill. t. 151.* From the Pecos to the Colorado; March and April.

## OXALIDACEÆ.

OXALIS WRIGHTII, *Gray, Pl. Wright. 1, p. 27.* On the Pecos; March.

## LINACEÆ.

LINUM RIGIDUM, *Pursh, Fl. 1, p. 210.* On the Pecos, Llano Estacado, and upper Colorado; March, April.

LINUM MULTICAULE, *Hook. in Torr. and Gray, Fl. 1, p. 678.* Llano Estacado; April; Mr. Garrard.

LINUM PERENNE, *Linn.* From New Mexico to the Colorado; March, April.

## ZYGOPHYLLACEÆ.

LARREA MEXICANA, *Moricand; Torr. in Emory's Rep. p. 137, t. 3.* From the Rio Grande to Llano Estacado, &c. Not yet in flower.

## RUTACEÆ.

ZANTHOXYLUM CAROLINIANUM, *Lam.; Torr. and Gray, Fl. 1, p. 214.* Western Texas; April. The variety characterized in *Pl. Wright. t. p. 31.*

RUTOSMA TEXANUM, *Gray, Gen. Ill. 2, p. 144, t. 155?* On the Pecos, &c.; March.

\* \* Captain Pope collected, on the Organ mountains, specimens, without flowers or fruit, of a remarkable Rutaceous plant, which had been previously gathered there by Mr. Wright, and afterwards by H. B. Gray, Esq. We have also received it from Dr. Edwards, of the United States army, who found it on the Mimbres. Dr. J. M. Bigelow and Mr. Schott were so fortunate as to detect it in fruit, while they were engaged in the Mexican boundary survey, under the command of Major W. H. Emory. The former gentleman collected it, in 1852, on the Florence mountains, which, we believe, are in the southern part of New Mexico, near the Rio Grande; and Mr. Schott obtained it farther down the river. For want of the flowers, a complete description of the plant cannot be given; but there are sufficient materials to show that it is quite a distinct genus, of which a full account will be given in Dr. Torrey's botany of the Mexican boundary survey, under the name of ASTROPHYLLUM DUMOSUM. The plant is a low, much branched shrub, with opposite, palmately 7-10-foliolate, petiolate leaves; the leaflets narrowly linear, coriaceous, marked (as are the petioles and younger branches) with large and prominent glands. These glands on the leaflets are somewhat distant, and form a row along each margin. They are filled with a strong-smelling, acrid, volatile oil. The flowers are hermaphrodite, solitary, on long pedicels, which are lateral and terminal. On one of the specimens was a flower-bud, and on the other specimens were several pedicels supporting unfructified ovaries, besides abundance of ripe fruit. The bud contained ten stamens in two series, with sub-



late filaments from a broad base, and oblong 2-celled anthers. Opposite the shorter or interior stamens, (and alternating with the exterior ones,) were five ovate scales or petals. The characters of the calyx were not satisfactorily determined. There was no disk perceptible in the bud, and it is very inconspicuous in the flowers that had not matured their fruit. There are five one-celled oblong ovaries, which slightly cohere towards the base, each produced into a short incurved beak or horn. The styles are distinct, and arise from near the middle of the carpels on the inside; but the stigmas are united into an oblong 5-grooved head. Ovules two in each cell, collateral, inserted at the origin of the style. Only two of the carpels ripen. They are sessile, slightly united at the base, broadly ovate, compressed, dotted with small brown glands, and mucronate with the persistent base of the style; but the beak, which in the ovary was at the summit of the cell, has now become a dorsal tooth. At an early period the capsule opens nearly the whole length of the ventral suture, and down the back as far as the tooth. The endocarp also separates almost entirely from the epicarp. The seeds are usually solitary in each cell. They are ovate-globose, black and shining. The embryo is broadly oval, slightly curved, flattish, with a very short radicle; and there is little or no albumen.

## ANACARDIACEÆ.

RHUS GLABRA, *Linn.* Near Fort Washita; April.

RHUS TRILOBATA, *Nutt. in Torr. and Gray, Fl. 1, p. 219.* On the upper Colorado, Texas; April.

RHUS MICROPHYLLA, *Engelm. in Pl. Wright. 1, p. 31.* With the preceding species.

## VITACEÆ.

VITIA RUPESTRIS, *Scheele, in Linnæa, 21, p. 591.* Western Texas; April 21. In flower.

## RHAMNACEÆ.

CEANOTHUS OVATUS, *Desf. (C. ovalis, Bigelow.)* Near Fort Chadbourne; also a downy variety on the Colorado, Texas.

ZIZYPHUS LYCIODES, *Gray, Pl. Lindh. 2, p. 168.* Western Texas; April.

MICRORHAMNUS ERICOIDES, *Gray, Pl. Wright. 1, p. 34.* Near Delaware Springs, &c.; March.

## SAPINDACEÆ.

SAPINDUS MARGINATUS, *Willd.; Gay, Gen. Ill. 2, t. 180.* Pecos and Llano Estacado. Called *Wild China* in Texas and Arkansas.

UNGNADIA SPECIOSA, *Endl.; Gray, Gen. Ill. 2, t. 178, 179.* Big Springs of the Colorado and elsewhere; April.

## POLYGALACEÆ.

POLYGALA ALBA, *Nutt. Gen. 2, p. 87.* Llano Estacado, Colorado, &c.

POLYGALA MACRADENIA, *Gray, Pl. Wright. 1, p. 38.* On the Pecos; March.

KRAMERIA LANCEOLATA, *Torr.; Gray, Gen. Ill. t. 187, 188.* Western Texas; April.

## LEGUMINOSÆ.

VICIA LEAVENWORTHII, *Torr. and Gray, Fl. 1, p. 271.* On the upper Colorado, Texas; April.

VICIA EXIGUA, *Nutt. in Torr. and Gray, l. c.; Gray, Pl. Wright. 2, p. 32.* Llano Estacado; March, April.

TEPHROSIA VIRGINIANA, *Pers. Syn. 2, p. 328.* Western Texas; May.

AMORPHA FRUTICOSA, *Linn. var.* On the upper Colorado; April.



- PSORALEA ESCULENTA, *Pursh, Fl. 2, p. 475, t. 22.* On the Colorado, Western Texas; April.
- PSORALEA OBTUSILOBA, *Torr. and Gray, Fl. 1, p. 300.* Western Texas; May.
- PSORALEA FLORIBUNDA, *Nutt. in Torr. and Gray, Fl. l. c.* Western Texas; May.
- PSORALEA CUSPIDATA, *Pursh, Fl. 2, p. 741.* Western Texas; April.
- PSORALEA DIGITATA, *Nutt. in Torr. and Gray, l. c.* Western Texas; April.
- DALEA FORMOSA, *Torr. in Am. Lyc. N. York, 2, p. 78; and in Emory's Rep. t. 1.* Everywhere between the Rio Grande and Western Texas.
- PETALOSTEMON VIOLACEUM, *Michx.* Near Fort Washita.
- PETALOSTEMON CANDIDUM, *Michx.* Near Fort Washita.
- ASTRAGALUS MOLLISSIMUS, *Torr. in Am. Lyc. N. York, 2, p. 178; Gray, Pl. Wright. 1, p. 53.* On the Llano Estacado, in sandy soil; March, April. Plant sometimes considerably caulescent, and a foot high.
- ASTRAGALUS SUCCUMBENS, *Dougl. in Hook. Fl. Bor.-Am. 1, p. 151.* On the Pecos, Llano Estacado, &c.; March, April. The specimens are only in flower; in which state they very well accord with Douglas' plant. Mr. Gordon also gathered it in flower on the Raton mountains.
- ASTRAGALUS PAUCIFLORUS, *Hook. Fl. Bor.-Am. 1, p. 129.* High grounds at the head-waters of the Colorado, Texas; April.
- ASTRAGALUS MISSOURIENSIS, *Nutt. Gen. 2, p. 99.* Guadalupe mountains to the Colorado; March, April.
- ASTRAGALUS CYANEUS, *Gray, Pl. Fendl. p. 34.* Between the Pecos and Llano Estacado. Probably too near the preceding species.
- ASTRAGALUS NUTTALLIANUS, *DC., var. trichocarpus and canescens, Gray, Pl. Wright.* From the Pecos to the Colorado; March, April.
- ASTRAGALUS LINDHEIMERI, *Gray, Pl. Wright. 1, p. 52.* On the upper Colorado; April.
- ASTRAGALUS CANDENSIS, *Linn.* Near Fort Washita; April.
- ASTRAGALUS, *n. sp.?* In flower only. High ground, on the eastern border of the Llano Estacado; April.
- OXYTROPIS LAMBERTI, *Pursh, Fl. 2, p. 740.* Western Texas; May.
- STYLOSANTHES ELATIOR, *Swartz.; DC. Prodr. 2, p. 381.* Western Texas; May.
- DESMODIUM CANESCENS, *DC. Prodr. 2, p. 238.* Near Fort Washita.
- LESPEDEZA STUVEI, *Nutt. Gen. 2, p. 107.* Near Fort Washita.
- SOPHORA SERICEA, *Nutt. Gen. 1, p. 280.* Western Texas; April.
- CERCIS OCCIDENTALIS, *Torr. in Pl. Lindh. 2, p. 177.* Near Fort Chadbourne; May.
- HOFFMANSEGGIA STRICTA, *var. demissa, Benth. in Pl. Wright. 1, p. 56.* Llano Estacado to the Colorado; April. In flower.
- HOFFMANSEGGIA DREPANOCARPA, *Gray, Pl. Wright. 1, p. 58.* On the Pecos.
- HOFFMANSEGGIA BRACHYCARPA, *Gray, l. c.* On the Pecos.
- HOFFMANSEGGIA JAMESII, *Torr. and Gray, Fl. 1, p. 393; Torr. in Marcy's Rep. t. 4.* Llano Estacado.
- CASSIA PUMILIO, *Gray, Pl. Lindh. 2, p. 180; and Pl. Wright. 1, p. 59.* Llano Estacado, &c.; April.
- CASSIA BAUHINIODES, *Gray, l. c.* Llano Estacado; April.
- CASSIA RÆMERIANA, *Scheele; Gray, Pl. Lindh. 2, p. 179.* Western Texas; April.
- STROMBOCARPA PUBESCENS, *Gray, Pl. Wright. 1, p. 60; (Prosopis, Benth.)* Near Doña Ana. The fruit only; called *Tornio, or Screw-tree*; in some districts *Screw-bean*.



ALGAROBIA GLANDULOSA, *Torr. and Gray, Fl. 1, p. 399.* Head-waters of the Colorado, Texas; April. This is the celebrated *Mezquit* of New Mexico.

DESMANTHUS JAMESII, *Torr. and Gray, Fl. 1, p. 402.* Llano Estacado, &c. Foliage only.

SCHRANKIA PLATYCARPA, *Gray, Pl. Lindh. 2, p. 183.* Western Texas; April.

MIMOSA BOREALIS, *Gray, Pl. Fendl. p. 39.* On the upper Colorado, and near Fort Chadbourne; April, May.

ACACIA HIRTA, *Nutt. in Torr. and Gray, Fl. 1, p. 404.* Western Texas; April.

ACACIA TEXENSIS, *Torr. and Gray, l. c.* (Probably the *A. cuspidata, Schlecht.*) Near Fort Washita.

## ROSACEÆ.

PRUNUS AMERICANA, *Marsh.; Torr. and Gray, Fl. 1, p. 407.* Big Springs of the Colorado; April.

PRUNUS CHICASA, *Michx.; Torr. and Gray, l. c.* On the Colorado; April.

CERCOCARPUS PARVIFOLIUS, *Nutt. in Torr. and Gray, Fl. 1, p. 427.* Doña Ana, New Mexico; February. Foliage only.

FALLUGIA PARADOXA, *Torr. in Emory's Rep. t. 2.* Guadalupe mountains, New Mexico. Foliage only.

GEUM VIRGINIANUM, *Linn.* Western Texas; May.

ROSA SETIGERA, *Michx.; Torr. and Gray, Fl. 1, p. 457.* Fort Washita; April.

RUBUS TRIVIALIS, *Michx.; Fl. 1, p. 296.* Near Fort Washita.

## ONAGRACEÆ.

ÆNOTHERA LAVENDULÆFOLIA, *Torr. and Gray, Fl. 1, p. 501.* Llano Estacado; April.

ÆNOTHERA HARTWEGI, *Benth. Pl. Hartw. p. 1;* the var. answering to *Æ. Fendleri; Gray, Pl. Fendl.* On the Pecos, Llano Estacado, and Colorado.

ÆNOTHERA TUBICULA, *Gray, Pl. Wright. 1, p. 71.* On the Pecos and Llano Estacado.

ÆNOTHERA ALBICAULIS, *Nutt. Gen. 1, p. 245; Gray, Pl. Wright. 1, p. 59.* On the Pecos.

ÆNOTHERA TRILOBA, *Nutt. Gen. l. c.* On the Pecos.

ÆNOTHERA SERRULATA, *Nutt. l. c.* Big Springs of the Colorado to Fort Washita, &c.; April.

ÆNOTHERA SINNATA, *Linn.* Near Fort Washita; April. Western Texas; May.

ÆNOTHERA WRIGHTII, *Gray, Pl. Wright. 2, p. 57.* On the Llano Estacado; April. In flower.

ÆNOTHERA MISSOURIENSIS, *Sims, Bot. Mag. t. 1592.* Western Texas; May.

ÆNOTHERA SPECIOSA, *Nutt.; Torr. and Gray, Fl. 1, p. 496.* Western Texas; April.

ÆNOTHERA SPACHIANA, *Torr. and Gray, Fl. 1, p. 498.* Western Texas; May.

GAURA PARVIFLORA, *Dougl.; Torr. and Gray, Fl. 1, p. 519.* Llano Estacado and Western Texas.

GAURA SUFFULTA, *Engelm. in Pl. Lindh. 2, p. 190.* Western Texas.

GAURA COCCINEA, *Nutt.; Torr. and Gray, Fl. 1, p. 518.* Llano Estacado.

GAURA SINUATA, *Nutt.; Torr. and Gray, l. c.* Western Texas; April.

## CUCURBITACEÆ.

SICYDIUM LINDHEIMERI, *Gray, Pl. Lindl. 2, p. 196.* On the Pecos, also Western Texas; March, April.

CUCURBITA PERENNIS, *Gray, l. c.* Western Texas; April. Foliage only.



## PASSIFLORACEÆ.

PASSIFLORA INCARNATA, *Linn.*; *Torr. and Gray, Fl. 1. p. 538.* Western Texas; May.

## GROSSULACEÆ.

RIBES AUREUM, *Pursh.* Big Springs of the Colorado, &c.; April.

## CACTACEÆ.

CEREUS CÆSPITOSUS, ECHINOCACTUS TEXENSIS, and OPUNTIA FRUTESCENS, *Engelm.*, occur in the collection.

## UMBELLIFERÆ.

AMMOSELINUM, n. gen. Margin of the calyx obsolete. Petals ovate, entire, nearly plane. Stylopodium very short, as are the diverging styles. Fruit ovate, laterally compressed. Carpels with five equal, prominent, corky, and scabrous ribs, in the intervals of which there are single oil-tubes, and two in the commissure. Carpophore 2-parted. Seed straight, semiterete, slightly concave on the face.—An annual diffuse herb; the leaves decomposed with linear ultimate segments; flowers in compound umbels, white; leaflets of the involucre and involucels simple or compound.

AMMOSELINUM POPEI.—Sandy soil; Llano Estacado, and head-waters of the Colorado; March and April. Mr. Wright found it in Western Texas, but he collected only a few specimens, and it was not distributed with his plants. Some ripe seeds that he collected were cultivated in the Cambridge Botanic Garden, and arrived at perfection. Dr. Parry, while engaged on the Mexican boundary survey, under Major Emory, sent home a single flowering specimen of the plant, found at Eagle Pass in January, 1853. From no other sources have we received any specimens of this apparently new genus. It grows about a span in length, and though usually diffuse, some of Captain Pope's specimens must have grown erect, and only a little branched; but they seem to have been crowded together. The stem and branches are angular, and the angles, as well as the midribs of the leaves, are rough; in other respects the plant is nearly glabrous. The leaves are triternally divided, with narrowly linear segments. Umbels compound, or sometimes decomposed. Involucre of several leaves, which in strong-growing specimens are large, and resemble the leaves of the stem, being cut into linear segments: the leaves of the involucels are sometimes cut also, but more commonly they are almost entire. Rays of the umbel seldom more than three or four, unequal: rays of the umbellets 8–10, very unequal. Flowers very small. Fruit about two and a half lines long and two lines broad, compressed laterally, so that the longer diameter is twice as great as the shorter; the ribs scabrous with little points. The lateral ones are less prominent, and are confluent with an accessory, thick, corky margin, which extends through the commissure. We have with reluctance added another genus to the already extensive family of Umbelliferæ, already abounding with ill-defined genera, especially as it is founded on a single species. It is most nearly allied to Chaerophyllum, but differs in the entire petals, ovate fruit with acute ribs, and shallow furrows of the seed, as well as in the involucre.

CYMOPTERUS MONTANUS, *Nutt. in Torr. and Gray, Fl. 1, p. 624; Gray, Pl. Fendl. p. 56, and Pl. Wright, 1, p. 79.* Eastern part of the Llano Estacado and on the upper Colorado; April.

POLYTÆNIA NUTTALLII, *DC. Prodr. 4, p. 196.* On the Colorado, Texas; April. In flower.

DAUCUS PUSILLUS, *Michx. Fl. 1, p. 164.* On the Colorado, Texas; April.



## RUBIACEÆ.

OLDENLANDIA (HOUSTONIA) HUMIFUSA, *Gray, Pl. Wright. 2, p. 68.* On the Llano Estacado and Pecos; March. A vernal state.

OLDENLANDIA ANGUSTIFOLIA, *Gray, l. c.* Fort Washita and Western Texas; April, May.

GALIUM APARINE, *Linn.* On the Colorado; April. Not in flower.

## VALERIANACEÆ.

FEDIA AMARELLA, *Lindh. in Gray, Pl. Lindh. 2, p. 217.* On the Colorado, &c., Texas; April, May.

## COMPOSITÆ.

MACHÆRANTHERA TANACETIFOLIA, *Nees; Gray, Pl. Wright. 1, p. 90.* On the Llano Estacado and Western Texas; March to May.

ERIGERON STRIGOSUM, *Muhl.; Torr. and Gray, Fl. 2, p. 176.* Near Fort Washita; April.

ERIGERON DIVERGENS, *Torr. and Gray, l. c.; Gray, Pl. Wright. 1, p. 91.* From the Pecos to the Colorado, Texas. Various forms.

DIPLOPAPPUS ERICOIDES, *Torr. and Gray, Fl. 2, p. 182.* New Mexico to the Colorado; March, April. Various forms.

TOWNSENDIA SERICEA, *Hook, Fl. Bor.-Am. 2, p. 16, t. 119.* Guadalupe mountains, New Mexico; March.

CHÆTOPAPPA ASTEROIDES, *DC. Prodr. 5, p. 301.* Western Texas; April, May.

APHANOSTEPHUS RAMOSISSIMUS, *DC. Prodr. 5, p. 310; Gray, Pl. Wright. 1, p. 93; Torr. in Marcy's Rep. t. 9.* Big Springs of the Colorado; April.

APHANOSTEPHUS ARKANSANUS, *Gray, l. c.* Western Texas; May.

BELLIS INTEGRIFOLIA, *Michx. Fl. 1, p. 131.* Western Texas; May.

APLOPAPPUS SPINULOSUS, *DC. Prodr. 5, p. 348.* From the Pecos to the Colorado, Texas.

XANTHISMA TEXANUM, *DC. Prodr. 5, p. 94; Gray, Pl. Wright. 1, p. 98; Torr. in Marcy's Rep. t. 10.* Western Texas, May.

SOLIDAGO CANADENSIS, *Linn.* Near Fort Washita; April. Not in flower.

CALYMMANDRA CANDIDA, *Torr. and Gray, Fl. 2, p. 262.* (Plate II.) Western Texas, on the upper Colorado; April. This has scarcely been collected since it was gathered by Drummond.

FILAGINOPSIS MULTICAULIS, *Torr. and Gray, Fl. 2, p. 263.* (Plate III.) On the Pecos and Llano Estacado; March. Western Texas; April. Sterile corollas, naked at the summit, but bearing a few long wooly hairs near the base.

PARTHENIUM HYSTEROPHORUS, *Linn.* Pecos and Llano Estacado.

MELAMPODIUM CINEREUM, *DC. Prodr. 5, p. 518.* Banks of the Pecos to the Colorado; March to May.

BERLANDIERA LYRATA, *Benth.; Gray, Pl. Fendl. p. 78.* Llano Estacado, March.

ENGELMANNIA PINNATIFIDA, *Torr. and Gray, in Trans. Amer. Phil. Soc. and Fl. 2, p. 283; Torr. in Marcy's Rep. t. 11.* Western Texas to the head of the Colorado; April, May.

LINDHEIMERIA TEXANA, *Gray and Engelm. Pl. Lindh. 2 p. 225.* Western Texas; April.

ZINNIA MULTIFLORA, *Linn.* Near Fort Chadbourne, Texas.

ECHINACEA ANGUSTIFOLIA, *DC. Prodr. 5, p. 554.* Var. Western Texas; April.

SIMSIA (BARRATTIA) CALVA, *Gray, Pl. Lindh. 2, p. 228.* On the upper Colorado; April.

DRACOPIS AMPLEXICAULIS, *Cass.; DC. Prodr. 5, p. 558.* Near Fort Washita; April.

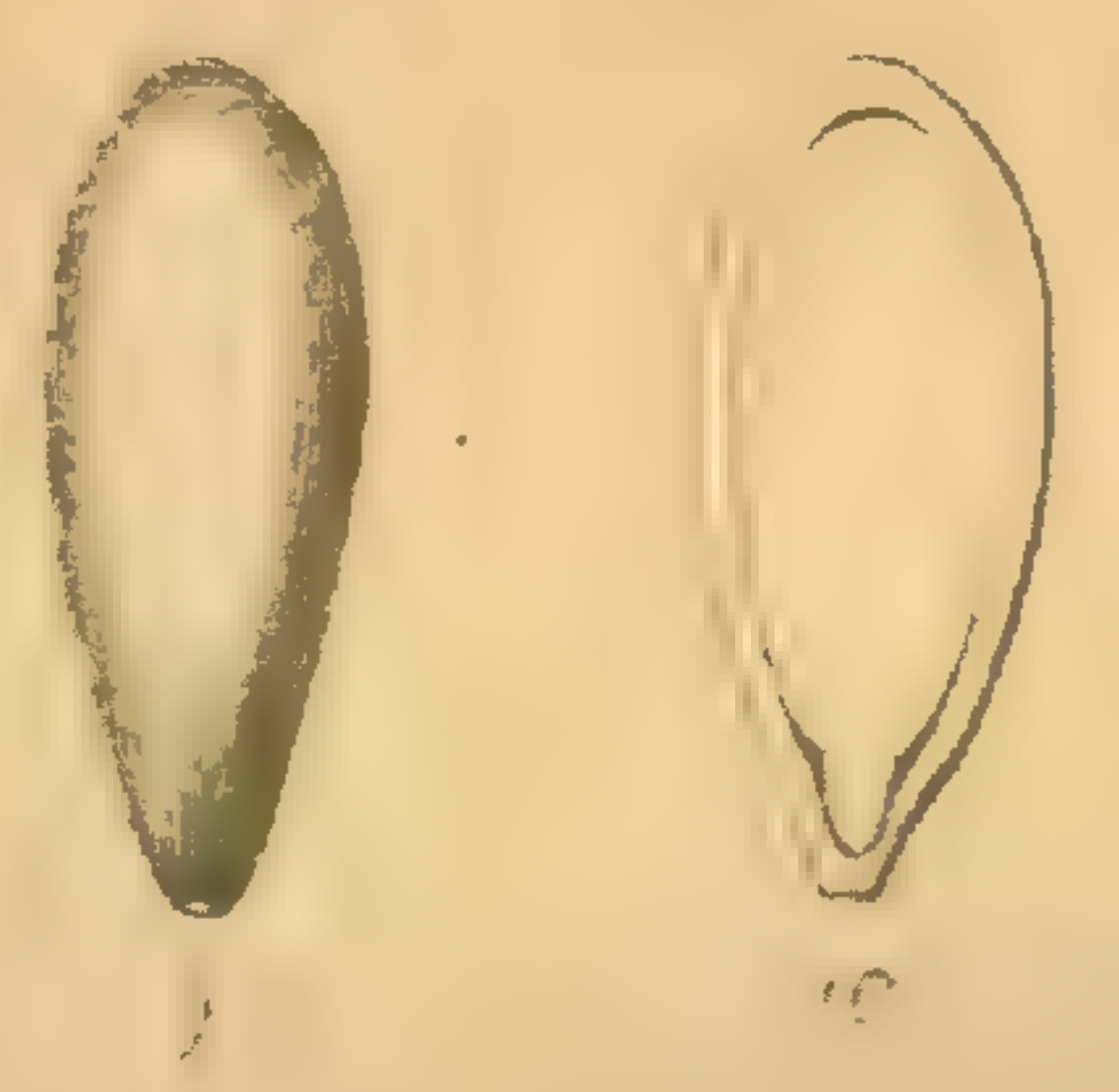
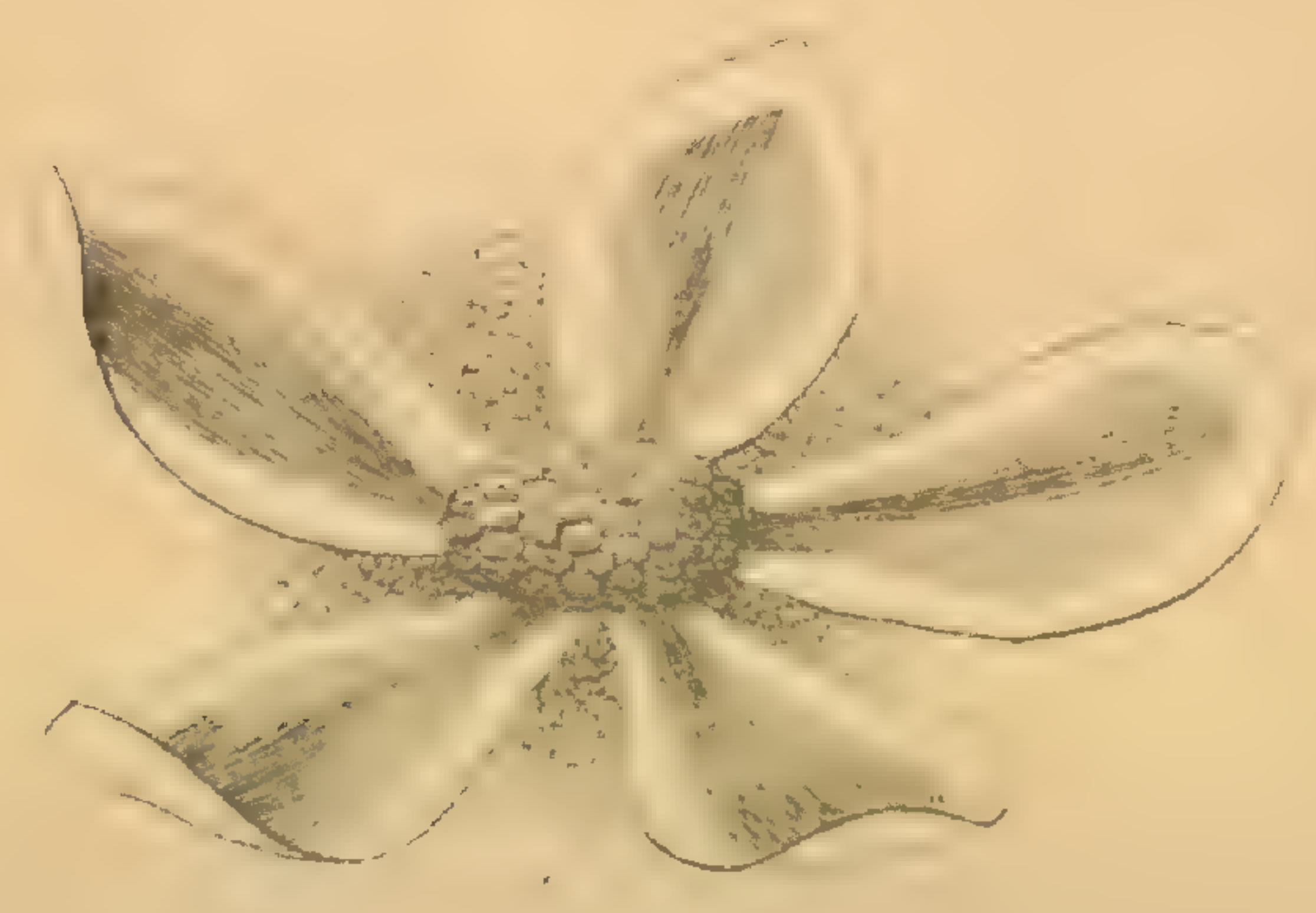




*SALICORNIA PERUVIANA*

PLANT LIFE





*MAHONIA MULTICAULIS.*

*Fraxinifolia Nutt.*

Fraxinifolia



- ACTINOMERIS HELIANTHOIDES, *Nutt. Gen.* 2, p. 181. Near Fort Washita; April.
- THELESERMA FILIFOLIA, *Gray, in Hook. Kew. Jour. Bot.* 1, p. 252, and *Pl. Wright.* 1, p. 109. Head-waters of the Colorado; April. Also probably *T. GRACILIS*; but not yet in flower.
- COREOPSIS GRANDIFLORA, *Nutt.; Torr. and Gray, Fl.* 2, p. 345. On the Colorado; April.
- COREOPSIS TINCTORIA, *Nutt.* Near Fort Washita; April.
- CHRYSACTINIA MEXICANA, *Gray, Pl. Fendl.* p. 93. Near Independence Spring; March. Without flowers.
- HYMENATHERUM (ACIPHYLLÆA) ACEROSUM, *Gray, Pl. Wright.* 1, p. 115. On the Pecos and Llano Estacado; March, April.
- HYMENATHERUM PENTACHÆTUM, *DC. Prodr.* 5, p. 642. On the Pecos; March.
- AGASSIZIA SUAVIS, *Gray and Engelm. Pl. Lindh.* 2, p. 220. Western Texas; April.
- GAILLARDIA AMBLYODON, *Gray; Torr. and Gray, Fl.* 2, p. 267; *Gray, Chl. Bor.-Am. t.* 4. Western Texas; April.
- GAILLARDIA PINNATIFIDA, *Torr. in Ann. Lyc. New York,* 2, p. 214; *Torr. and Gray, Fl.* 2, p. 366. Llano Estacado to the Colorado; March, April.
- GAILLARDIA PULCHELLA, *Fougeroux; Torr. and Gray, l. c.* Western Texas; April.
- HYMENOPAPPUS CORYMBOSUS, *Torr. and Gray, Fl.* 2, p. 272. On the Colorado, &c.; April.
- BAHIA ABSINTHIFOLIA, *Benth. var. DEALBATA, Gray, Pl. Wright.* 1, p. 121. On the Pecos; March.
- RIDDELLIA TAGETINA, *Nutt.; Torr. and Gray, Fl.* 2, p. 262; *Torr. in Emory's Rep. t.* 5. Llano Estacado; March.
- AMBLYOLEPIS SETIGERA, *DC. Prodr.* 5, p. 568; *Gray, Pl. Wright.* 1, p. 121. From the Llano Estacado to the lower Colorado; March, April.
- ACTINELLA SCAPOSA, *Nutt. in Torr. and Gray, Fl.* 2, p. 382. On the Pecos and Llano Estacado; March.
- ACTINELLA LINEARIFOLIA, *Nutt.; Torr. and Gray, l. c.* On the Pecos.
- ACTINELLA RICHARDSONII, *Nutt. Picradenia Richardsonii, Hook.* Near the Pecos; March.
- HELENIUM TENUIFOLIUM, *Nutt.; Torr. and Gray, Fl.* 2, p. 385. Western Texas; April.
- MARSHALLIA CÆSPITOSA, *Nutt. in DC. Prodr.* 5, p. 680. On the upper Colorado; April.
- ACHILLEA MILLEFOLIUM, *Linn.* Near Fort Washita and on the Colorado.
- ARTEMISIA DRACUNCULOIDES, *Pursh; Torr. and Gray, Fl.* 2, p. 216. Sacramento river to the Llano Estacado; March.
- ARTEMISIA LEWISII, *Torr. and Gray, Fl.* 2, p. 217. Pecos to the Llano Estacado; March.
- ARTEMISIA LUDOVICIANA, *Nutt.; Torr. and Gray, Fl.* 2, p. 420. Cotton-wood Springs, New Mexico, &c.; March.
- GNAPHALIUM LUTEO-ALBUM, *Linn.* New Mexico and Western Texas.
- SENECIO FILIFOLIUS, *Nutt. var. JAMESII, Torr. and Gray, Fl.* 2, p. 444. On the Pecos and upper Colorado.
- SENECIO LOBATUS, *Pers.; Torr. and Gray, l. c.* Western Texas; April.
- CIRSIIUM VIRGINIANUM, *Michx. Fl.* 2, p. 90. Western Texas; April.
- CIRSIIUM UNDULATUM, *Spreng.; DC. Prodr.* 6, p. 651. Llano Estacado, &c.
- CENTAUREA AMERICANA, *Nutt.* Near Fort Washita; April.
- PEREZIA NANA, *Gray, Pl. Fendl.* p. 111. On the Pecos; March. The foliage only.
- APOGON HUMILIS, *Ell. Sk.* 2, p. 267. Western Texas; May.
- KRIGIA OCCIDENTALIS, *Nutt.; Torr. and Gray, Fl.* 2, p. 467. Western Texas; May.



PINAROPAPPUS ROSEUS, *Less.*; *DC. Prodr.* 7, p. 99. Western Texas; April.

LYGODESMIA APHYLLA, *DC.* var. *TEXANA*, *Torr. and Gray, Fl.* 2, p. 484. Western Texas; April.

PYRRHOPAPPUS GRANDIFLORUS, *Nutt.*; *Torr. and Gray, Fl.* 2, p. 495. Big Springs of the Colorado, &c.; April.

#### CAMPANULACEÆ.

DYSMICODON OVATUM, *Nutt. in Trans. Amer. Phil. Soc. (n. ser.)* 8, p. 256. *Speculariæ* sp. *Torr. Mss.* Western Texas; April to May.

DYSMICODON PERFOLIATUM, *Nutt. l. c.* *Campanula perfoliata*, *Linn.* *Specularia perfoliata*, *Alph. DC. Prodr.* 7, pars 2, p. 490, (in part.) With the preceding.

#### PLANTAGINACEÆ.

PLANTAGO VIRGINICA, *Linn.* Llano Estacado, and on the Colorado; March, April.

PLANTAGO GNAPHALIOIDES, *Nutt. Gen.* 1, p. 100. On the Pecos; March.

#### PRIMULACEÆ.

DODECATHEON MEADIA, *Linn.* Western Texas; May.

#### ACANTHACEÆ.

STENANDRIUM BARBATUM, (n. sp.; Plate IV): dwarf, multicapital, bearded all over with long and shaggy white hairs; scape at first shorter than the oblanceolate, or narrowly spatulate, entire, and scarcely petioled radical leaves; bracts oblong-lanceolate, acute, entire, nearly equalling the corolla; anthers bearded on the back and tip; stigma funnel-form, its oblong margin not ciliate; capsule oblong, 4-seeded. On the Pecos; March. First collected by Mr. Wright on a lower part of the same river. It is No. 1423 of his distributed collection.

DIPTERACANTHUS STREPENS, *Nees in DC. Prodr.* 11, p. 121. Western Texas; April, May.

CALOPHANES OBLONGIFOLIUS, *Don*; *Nees in DC. Prodr.* 11, p. 107, and var. *TEXENSIS*, *Nees.* Western Texas; April, May.

#### SCROPHULARIACEÆ.

LINARIA CANADENSIS, *Don.* On the Pecos, Llano Estacado, and Western Texas; March, May.

VERONICA PEREGRINA, *Linn.* Llano Estacado, &c.; March.

PENTSTEMON COBÆA, *Nutt.*; *Benth. in DC. Prodr.* 10, p. 326. Western Texas; April, May.

PENTSTEMON GRANDIFLORUS, *Nutt. in Fras. Cat.*; *Benth. in DC. l. c.* Near Fort Chadbourne; May.

PENTSTEMON ALBIDUS, *Nutt. Gen.* 2, p. 53. Upper Colorado, Texas; April.

PENTSTEMON FENDLERI, (n. sp.; Plate V): erect, glabrous throughout, glaucous; leaves coriaceous, entire, the radical ones ovate or obovate, and tapering into a short petiole, the cauline ovate or oblong, and closely sessile; flowers cymulose, or sometimes subsolitary in the axils of the upper leaves and obovate bracts, forming a strict interrupted panicle or series of apparent verticils; segments of the calyx ovate, with scarious margins; corolla (blue or purple) funnel-form, scarcely bilabiate, sparsely bearded or smooth in the throat; sterile filament dilated and densely (yellow) bearded at the summit. On the Pecos and Llano Estacado; March, April. A species which occurs in all the collections made in this region, and is considerably variable in size, foliage, the number of the flowers, (which are handsome, and eight or ten lines long,) the size of the bracts, &c. It is most nearly related to *P. acuminatus* and *P. nitidus*, especially to the latter.





STENANDRIUM BARBATUM.





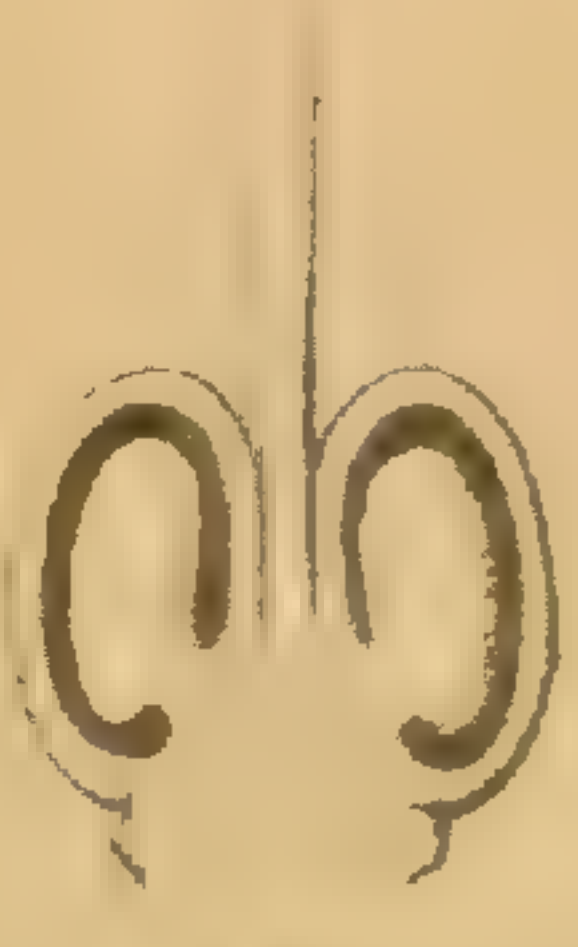
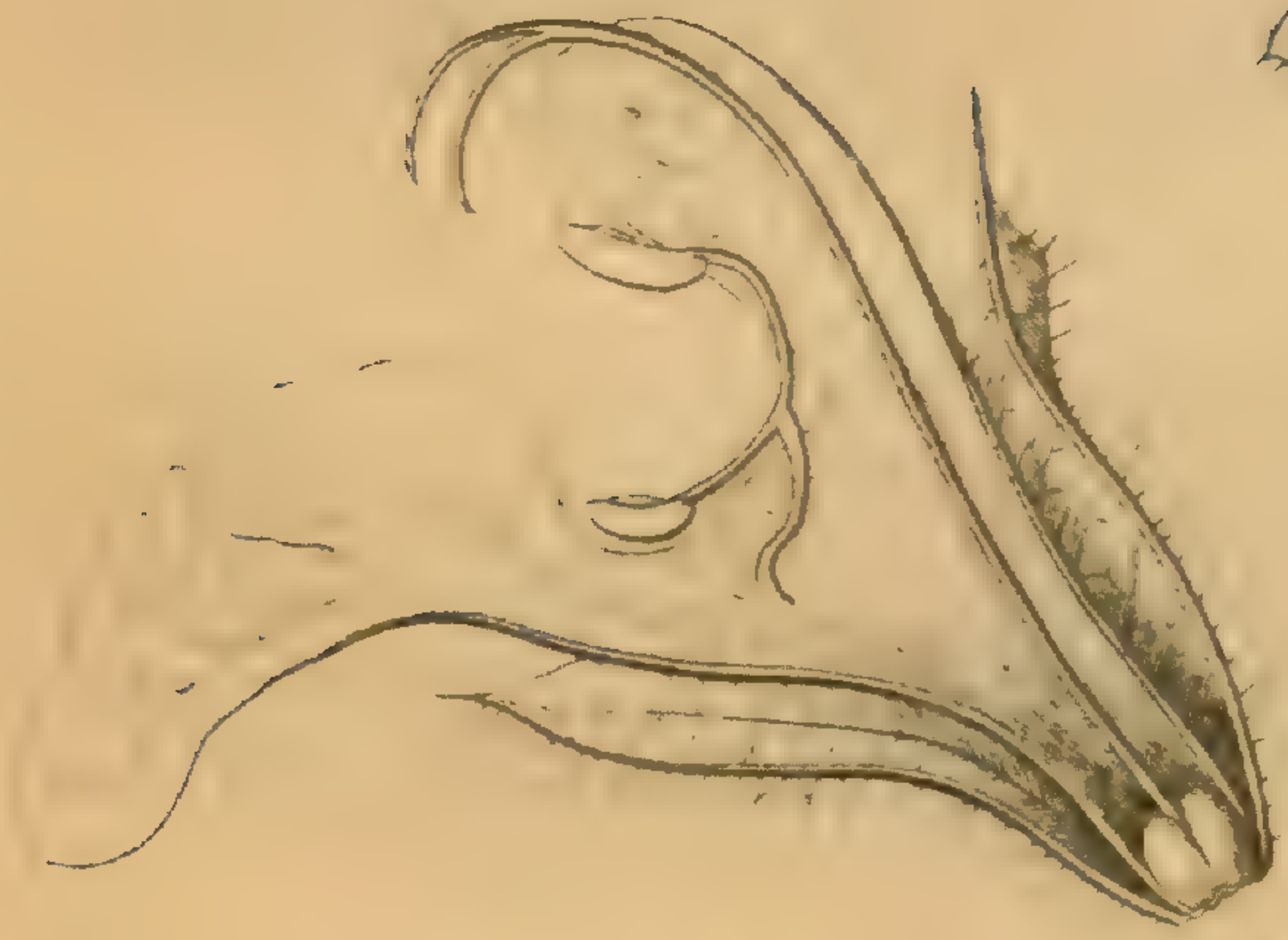
PENTSTEMON FENDLERI

Sprague del.

P. S. Duval & Co. Lith. Philad.

Frestelo sc.





SALVIASTRUM TEXANUM





STEGNOCARPUS CANESCENS.



PENTSTEMON PUBESCENS, *Soland.*; *DC. Prodr.* 10, p. 327. Western Texas; May.

CASTILLEJA PURPUREA, *Don*; *DC. Prodr.* 10, p. 531. Llano Estacado and Western Texas; March, April.

#### VERBENACEÆ.

VERBENA BIPINNATIFIDA, *Engelm. and Gray, Pl. Lindh.* 1, p. 49; *Schauer, in DC. Prodr.* 11, p. 553. *Glandularia bipinnatifida*, *Nutt.* Delaware creek to the Colorado; March, April.

VERBENA AUBLETIA, *Linn.* Upper Texas, &c.; April.

VERBENA BRACTEOSA, *Michx. Fl.* 2, p. 14. On the Pecos and Llano Estacado; March.

VERBENA OFFICINALIS, *Linn.* *V. spuria*, *Linn.*, etc. Western Texas; April, May.

#### LABIATÆ.

SALVIA FARINOSA, *Benth. Lab.* p. 274. On the Colorado; April. Probably not distinct from *S. Pitcheri*, *Torr.*

SALVIASTRUM TEXANUM, *Scheele, in Linnœa.* 22, p. 584. (Plate VI.) Gravelly soils, Llano Estacado; April. A common plant in Texas and New Mexico.

SCUTELLARIA RESINOSA, *Torr. in Ann. Lyc. New York*, 2, p. 232. On the Pecos and the headwaters of the Colorado; April.

TEUCRIUM CANADENSE, *Linn.*; *Benth. in DC. Prodr.* 12, p. 581. Near Fort Washita.

TEUCRIUM CUBENSE, *Linn.*; *Benth. l. c.*; *Torr. in Marcy's Rep.* p. 293. On the Pecos, &c.; April.

MONARDA ARISTATA, *Nutt. in Trans. Amer. Phil. Soc. (n. ser.)* 5, p. 186. In clayey soil; Western Texas. Annual.

MONARDO MOLLIS, *Nutt. l. c.* Near Fort Washita. Seems to be distinct from *M. fistulosa*.

#### BORAGINACEÆ.

STEGNOCARPUS, *DC.* (a section of *COLDENIA*). Calyx deeply 5-cleft; the lobes lanceolate-subovate. Corolla funnel-salverform; the throat naked; border 5-lobed, flat. Stamens five, inserted into the tube of the corolla. Style filiform, terminal, 2-parted: stigmas capitate. Ovary ovate, slightly 4-lobed. Fruit globose-quadrangular, depressed, consisting of four closely joined nutlets which are even, glabrous, (except a slight hairiness at the summit when young,) and at length separate.—A prostrate, much-branched, small under-shrub, canescent with appressed hairs. Leaves numerous, small, ovate, and petiolate. Flowers axillary, solitary or somewhat clustered, sessile, white.

*S. CANESCENS*, *Torr. in Emory's Rep. of Mex. Bound. Commiss. (ined.)* *Coldenia* (sect. *Stegnocarpus*) *canescens*, *DC. Prodr.* 9, p. 559. (Plate VII.) In decomposing gypseous gravel, on the Pecos. It is common in the valley of the Rio Grande, from El Paso to Monterey. Dr. Edwards found it near the latter place. It is the same as No. 1554–1556 of Wright's New Mexican collection. De Candolle founded the species and subgenus on specimens collected in Mexico by Berlandier, and numbered 2256\* in his collection. He states that the stamens are inserted at the summit of the tube of the corolla, and that the nutlets are silky-pubescent; whereas we found the stamens inserted near the base of the tube, and the nutlets glabrous. We therefore at first supposed our plant to be a distinct species, and called it *S. leiocarpa*. Having, however, recently obtained original specimens of Berlandier's No. 2256, we found that only the young fruit is a little pubescent near the summit. As to the insertion of the filaments, no great reliance is to be placed on that character in this family, owing to the tendency to a kind of dioicality that occurs in a number of the genera, such as has long been

\* No. 2389 of Berlandier's Collection is the same plant.



known to exist in certain Labiatæ and Rubiaceæ. De Candolle (l. c.) asks whether his section *Stegnocarpus* of *Coldenia* ought not to constitute a proper genus. If he had had as complete a series of specimens as we possess, no doubt he would have made the separation. It belongs to the tribe Ehretieæ, but has a fruit like that of some *Eritrichia*. The *Stegnocarpus* has a decidedly woody base, and seems to be usually prostrate. The leaves are 5-8 lines long (including the petiole) and 1-3 lines broad, ovate or oblong, rather acute at each end, and thickly clothed with appressed whitish hairs. The flowers are often solitary, but sometimes two or three together. Calyx 5-parted below the middle; the lobes subulate from a rather broad base. Corolla about four lines long; the tube ample, and a little longer than the calyx; the lobes crenulate. Stamens five, rather unequal: filaments subulate, usually inserted near the base of the corolla: anthers oblong. Ovary scarcely lobed: style compressed, about as long as the stamens, cleft to the middle; the segments filiform, erect, strongly capitate. Fruit consisting of four closely fitting nutlets, which separate at maturity. When young, there is often more or less pubescence towards the summit; but it finally disappears, and the fruit becomes smooth and shining on the back. The sides (where they come in contact) are somewhat wavy. The pericarp is coriaceous, and there is little or no albumen.

**PTILOCALYX**, (n. gen.) Calyx 5-parted nearly to the base; the segments subulate-filiform, plumose with spreading hairs. Corolla campanulate-salverform; the throat naked. Stamens five, inserted near the base of the tube. Ovary somewhat 4-lobed, 4-celled, with an obscure glandular ring at the base. Style filiform, terminal, 2-parted: stigmas minute, simple. Fruit coriaceo-chartaceous, one-celled (by abortion), with vestiges of three other cells. Seed solitary, terete; the embryo with little or no albumen. A low, much branching shrub, with small, ovate, entire, and somewhat fascicled leaves, and white flowers in short capitate terminal spikes. The name alludes to the feathery segments of the calyx.

**PTILOCALYX GREGGII**. (Plate VIII.) Western Texas; April. Common in New Mexico; *Mr. Wright and Dr. Parry*. (It is No. 492 of Mr. Wright's distributed collection.) Near Buena Vista, &c., Mexico; *Dr. Gregg*. A shrub of an ashy gray color, sometimes attaining the height of three feet, the bark separating in loose shreds. Leaves 3-5 lines long, thickish, on short petioles, revolute when dry. Heads of flowers half an inch in diameter. Calyx longer than the corolla; the segments villous-plumose with spreading hairs. Corolla white; the border obtusely 5-lobed. Stamens equal, included; filaments subulate, glabrous; anthers ovate, 2-celled. Ovary globose-ovate, glabrous, 4-celled, with an ovule suspended from the summit of each cell. Style 2-cleft about one third of its length. Fruit brown and shining, retrorsely hispid near the summit, crowned with the persistent style; only one of the cells fertile, the others very indistinct and collapsed; their place being indicated externally by a broad stripe on one side. This plant, which seems to have been hitherto undescribed, agrees in many respects with *Ehretia*; but differs in the remarkable fruit, which is unlike that of any other Boragineæ.

**EDDYA**, (n. gen.) Calyx deeply 5-parted. Corolla salverform, with the throat naked. Stamens inserted towards the summit of the tube of the corolla. Style terminal, elongated, 2-cleft: stigmas capitate. Ovary 4-lobed. Nutlets 4, globose-ovate, cohering by the inner angle, but finally separating, muriculate-scabrous. Cotyledons ovate, entire: radicle very short: albumen none, or very thin.—A small, prostrate, much branched, and very hispid undershrub, with crowded linear entire revolute leaves, and small axillary and solitary white flowers. Named in memory of Caspar Wistar Eddy, M. D., formerly of New York, a zealous and promising botanist, who died young, soon after publishing a catalogue of the plants growing around Plandome, Long Island.

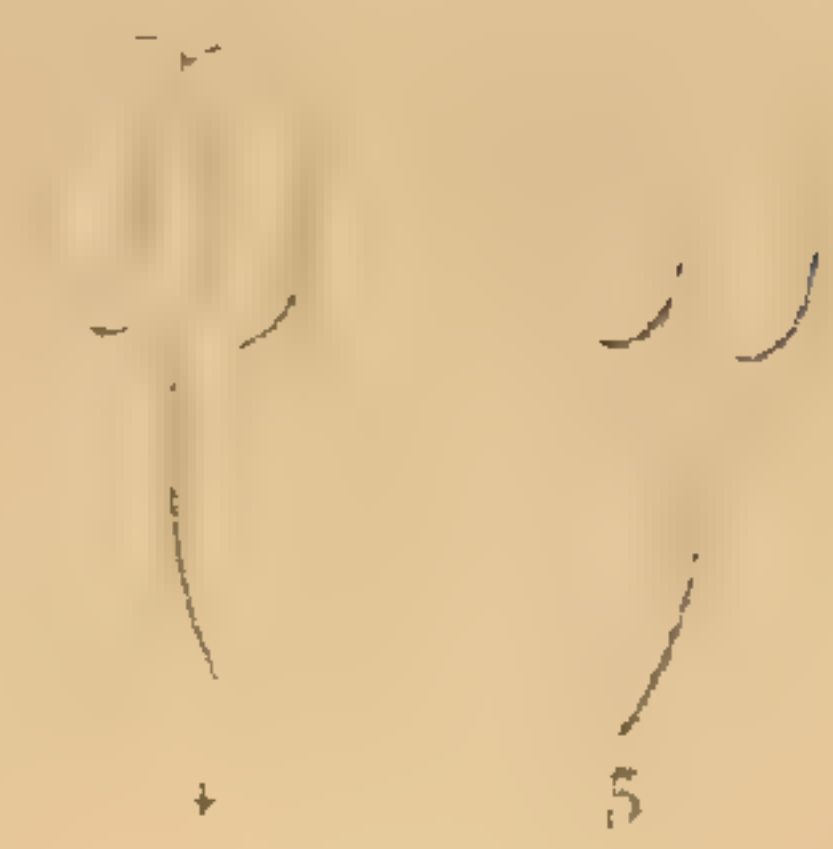
**EDDYA HISPIDISSIMA**. (Plate IX.) *Ehretia?* *hispida*, of the 1st edition of this report. Common on the Rio Grande about El Paso. It is the same as No. 845 of Mr. Wright's Texan collection, (1849) and No. 1557 of his New Mexican collection. The plant is much branched from the base, which is decidedly woody. Leaves 3-5 lines long, acute, and very hispid with





PTILOCALYX GREGGII





EDDYA HISPIDISSIMA



rigid whitish hairs: towards the summit of the numerous short branches they are much crowded, so as to appear fasciculate. Flowers sessile, 2-3 lines long. Calyx hispid, like the leaves; the tube somewhat indurated in fruit. Stamens unequal, included. Style cleft about one third of the way down, about as long as the stamens. Nutlets scarcely one third of a line in diameter, two or three of them usually abortive, of a dull gray color, roughened with very minute papillæ; the endocarp crustaceous and brittle.—Nearly allied to *Tiquilia* of Persoon, a genus very distinct from *Coldenia*, to which it was referred as a subgenus, with a mark of doubt, by De Candolle. Both genera seem to be more allied to the tribe Borageæ than to Ehretieæ.

*HELIOTROPIUM CURASSAVICUM*, *Linn.*; *DC. Prodr.* 9, p. 538. Pecos to Llano Estacado; March to April.

*ONOSMODIUM BEJARIENSE*, *DC. Prodr.* 10, p. 70. Western Texas; May.

*PENTALOPHUS LONGIFLORUS*, *Alph. DC. Prodr.* 10, p. 86. *Batschia longiflora*, *Nutt. Gen.* 1, p. 114. Gravelly soil; Llano Estacado, &c.; March to April.

*LITHOSPERMUM BREVIFLORUM*, *Engelm. and Gray, Pl. Lindheim, part 2, no.* 278. Gravelly soil, on the Pecos; April.

*ERITRICHIUM JAMESII*, *Torr. in Marcy's Rep.* p. 294. *Myosotis suffruticosa*, *Torr. in Ann. Lyc., New York*, 2, p. 225. Sandy soil, Llano Estacado; March.

*ERITRICHIUM MULTICAULE*, *Torr. in Marcy's Rep. l. c.* On the Pecos; March.

*ERITRICHIUM CRASSISEPALUM*, (n. sp.): annual, very hispid with spreading hairs; stem branching from the base; the branches ascending; leaves obovate-lanceolate, rather obtuse; racemes bracteate (except the upper portion); flowers on short pedicles; fructiferous calyx ventricose at the base, closed and contracted above the middle, the segments thickened and indurated on the back; nutlets heteromorphous, ovate, acute, convex on the back, three of them muriculate-granulate, the fourth larger and nearly or quite glabrous. On the Pecos, Llano Estacado, &c.; in sandy soil; March. A common species in Western Texas and New Mexico. It was found by Frémont on the Upper Platte. It is the same as No. 640 of Fendler's New Mexican collection. The flowers are white and variable in size, being in some specimens minute, and not much longer than the calyx, and in others quite conspicuous, as in the section *Cryptantha* of *Alph. DC.* This species, however, belongs to the section *Rutidocaryum*, as does the following.

*ERITRICHIUM PUSILLUM*, (n. sp.): annual, dwarfish, hispidly pilose; stem branching from the base; leaves spatulate-linear; racemes many-flowered, ebracteate; flowers sessile, approximate; calyx deeply 5-parted, the segments lanceolate and very hispid; corolla about as long as the tube of the calyx; nutlets ovate-subtriangular, acute, verrucose-granulate on the back. Rio Pecos to Llano Estacado; March. It is the same as No. 1571 of Mr. Wright's New Mexican collection. A very small species, being not more than two or three inches high even in fruit. It either branches from the base, or throws up numerous simple stems, which are somewhat spreading. The flowers are minute and white. The nutlets are light brown, scarcely one third of a line long, and roughened with somewhat distant granules or papillæ.

*ECHINOSPERMUM PATULUM*, *Lehm.*; *DC. Prodr.* 10, p. 137. Common in Western Texas.

*ECHINOSPERMUM STRICTUM*, *Nees, in Maximill. Trav. App.* *Cynoglossum pilosum*, *Nutt. Gen.* 1, p. 114? Llano Estacado; March to April. The nutlets are armed with 6-8 strong and short prickles on each side of an obtuse border surrounding a deep open cavity in front of each. Sometimes one of the nutlets is of a different form from the others. De Candolle refers *Nuttall's Cynoglossum pilosum* to *Pectocarya pencillata*, not from having seen the plant, but because it was said to resemble so strongly the figure of that species in the *Flora Peruviana*; but Mr. Nuttall (in *Plant Gamb.*) says it is "a true *Myosotis*," or rather an *Eritrichium*; so that it is wholly unlike *Pectocarya*.



## HYDROPHYLLACEÆ.

PHACELIA INTEGRIFOLIA, *Torr. in Ann. Lyc. New York*, 2, p. 222, t. 3. Delaware creek to the Pecos; March. Barely commencing to flower.

PHACELIA POPEI, (n. sp.; Plate X): vicosely pubescent, hispidulous with spreading hairs; leaves bipinnately parted, or pinnately cut, the circumscription linear-oblong; segments oblong, pinnatifid; the lobes 5-9, short and obtuse; spikes corymbose, densely flowered; segments of the calyx spatulate, about half the length of the campanulate corolla, and a little longer than the globose capsule; stamens somewhat exerted. On the Llano Estacado and Pecos, in gravelly soil; March and April. Stem four inches to a foot high from a biennial root, hispid, as are the branches, &c., with rather small and weak bristly hairs. Leaves 2-4 inches long; the primary divisions 3-10 lines long, or the lower ones more reduced in size, on the radical leaves barely a line or so in length, clothed with a minute and almost viscid pubescence, with stronger hairs intermixed; the lobes oval or oblong, very obtuse, entire or 2-3-toothed. Spikes an inch or more in length, not much elongated in fruit, dense; the flowers sessile, or nearly so. Calyx viscid-pubescent and hirsute rather than hispid; the segments spatulate, obtuse, a line and a half long, little increased in fruit. Corolla apparently white, about five lines in diameter when expanded; the rounded lobes entire or obsoletely crenulate; the ten appendages at the insertion of the filaments reduced to very short and rounded teeth. Filaments naked, at first slightly, at length considerably exerted. Style nearly naked. Ovary hirsute-pubescent. Capsule a line or a line and a half in diameter. Seeds four, oval, with the inner face strongly bilunate; the central keel very prominent. Albumen conformed to the testa. Fruiting specimens of this very distinct Phacelia are in Wright's collection, (No. 1578.) An abundance of flowering specimens were gathered by Dr. Garrard, as well as by Captain Pope, whose name we desire the species to bear.

## POLEMONIACEÆ.

GILIA LONGIFLORA, *Don; Torr. in Sitgreaves' Exped.* t. 7. On the Pecos and Llano Estacado; March.

GILIA RIGIDULA, *Benth. in DC. Prodr.* 9, p. 312. Llano Estacado and upper Colorado.

GILIA CORONOPIFOLIA, *Pers.; Benth. in DC. l. c.* Llano Estacado and near Fort Washita; March, April.

PHLOX DRUMMONDII, *Hook. Bot. Mag.* t. 3441; *Benth. l. c.* Western Texas; May.

PHLOX PILOSA, *Linn.; Benth. l. c.* Western Texas; May.

## CONVOLVULACEÆ.

EVOLVULUS ARGENTEUS, *Pursh, Fl.* 1, p. 187. On the upper Colorado, Texas; April.

CONVOLVULUS LOBATUS, *Engelm. and Gray, Pl. Lindh.* 1, p. 44. On the Colorado, Texas; April.

## SOLANACEÆ.

SOLANUM ELÆAGNIFOLIUM, *Cavan. Ic.* t. 243; *Dunal in DC. Prodr.* 13, p. 290. S. Texense, *Engelm. and Gray, Pl. Lindh.* 1, p. 19. S. Rœmerianum, *Scheele in Linnæa.* 21, p. 767. S. flavidum, *Torr. in Ann. Lyc. New York*, 1, p. 227. Western Texas; April, May.

SOLANUM ———, the S. mammosum, *Engelm. and Gray, Pl. Lindh. l. c.*, and the S. platyphyllum, *Torr. in Ann. Lyc.?* Western Texas; April. Not yet identified with any in De Candolle's Prodrômus.

SOLANUM ROSTRATUM, *Dunal, Solan.* t. 24; and *in DC. Prodr.* 13, p. 329. S. heterandrum, *Pursh, Fl.* 2, p. 731, t. 7. Western Texas; May.





PHACELIA POPEI.

Sprague del.

P. S. Duval & Co. Lith. Phila.

Hestele sc.



PHYSALIS LOBATA, *Torr. in Ann. Lyc. New York*, 1, p. 226. On the Pecos and Llano Estacado; March, April. Several forms, including, perhaps, more than one species. They are not true species of *Physalis*. We know not what Dunal has done with them; but he must have seen specimens in Berlandier's and other collections. There is also a genuine *Physalis* from Upper Texas, but not in a condition to name.

NICOTIANA RUSTICA, *Linn.?* Upper Colorado, Texas; April.

## GENTIANACEÆ.

SABBATIA CAMPESTRIS, *Nutt. in Trans. Amer. Phil. Soc.; DC. Prodr.* 9, p. 50. Near Fort Washita; April.

## JASMINACEÆ.

MENODORA HETEROPHYLLA, *Moricand, in DC. Prodr.* 8, p. 316; *Gray, in Sill. Jour.* 14, 1852. Western Texas; April. This is, doubtless, the *Boliviara Grisebachii*, *Scheele in Linnæa.* 25, p. 254.

## APOCYNACEÆ.

AMSONIA CILIATA, *Walt. Fl. Car.* p. 98. On the upper Colorado; April.

AMSONIA SALICIFOLIA, *Pursh, Fl.* 1, p. 184. On the Pecos. Only the broad-leaved form was in the collection.

## ASCLEPIADACEÆ.

ASCLEPIAS TUBEROSA, *Linn.; Michx. Fl.* 1, p. 117; var. *angustifolia*. Western Texas; May 10.

ACERATES PANICULATA, *Decaisne, in DC. Prodr.* 8, p. 521. *Anantherix paniculatus*, *Nutt.* Sandy soil, head-waters of the Colorado; April. This is the snake-weed of the Comanche Indians.

ACERATES VIRIDIFLORA, *Ell. Sk.* 1, p. 317. Var. 1. Leaves broadly ovate, mucronate, somewhat fleshy, smoothish. Var. 2. Leaves narrowly ovate, acute, somewhat hoary-pubescent. Llano Estacado.

ACERATES LONGIFOLIA, *Ell. l. c.; Decaisne, l. c.* Big Springs of the Colorado and Llano Estacado, in gravelly soil; April.

GONOLOBUS BIFLORUS, *Nutt. in herb. DC.* *Chthamalia biflora*, *DC. l. c.* p. 605. With the preceding.

## CHENOPODIACEÆ.

OBIONE CANESCENS, *Moq. Chenop.* p. 74. *Atriplex canescens*, *Nutt. Gen.* 1, p. 197. Mesilla valley, and from Delaware creek to Sacramento river; March.

OBIONE CONFERTIFLORA, *Torr. and Frem. in Frem. 2d Report*, p. 318. Gravelly soil, head-waters of the Colorado.

OBIONE ARGENTEA, *Moq. Chenop.* p. 76. *Atriplex argentea*, *Nutt. Gen.* 1, p. 198. Llano Estacado.

ANTHROCNUM FRUTICOSUM, *Moq. Chenop.* p. 111, and in *DC. Prodr.* 13, p. 181?; *Torr. in Stansb. Rep.* p. 394. In a saline, decomposed, gypseous soil, also on the borders of a salt lake on the Guadalupe mountains.

CHENOPODINA MARITIMA, *Moq. in DC. Prodr.* 13, (pars. 2,) p. 164. *Sueda maritima*, *Dumort.* *Chenopodium maritimum*, *Linn.* Saline soils between the Pecos and Llano Estacado. Not in flower.



## PHYTOLACCACEÆ.

PHYTOLACCA DECANDRA, *Linn.* Near Fort Washita; April.

## POLYGONACEÆ.

POLYGONUM LAPATHIFOLIUM, *Linn.? Willd. Sp. pl. 2, p. 442.* Near Fort Washita. Perhaps not distinct from *P. Persicaria*.

ERIOGONUM LONGIFOLIUM, *Nutt. in Trans. Amer. Phil. Soc. (n. ser.) 5, p. 164.* E. Texanum, *Scheele.* Gravelly soil, on the Pecos; April.

ERIOGONIUM CERNUUM, *Nutt. in Pl. Gambel.?* Llano Estacado, sandy soil. It differs in the pubescence of the leaves being rougher and more persistent.

RUMEX VENOSUS, *Pursh, Fl. supp. 2, p. 733.* Delaware creek, and along the Pecos; March.

RUMEX ACETOSELLA, *Linn.; Pursh, Fl. 1, p. 249.* Western Texas. Probably introduced.

RUMEX BRITANNICA, *Linn.; Torr. Fl. New York, 2, p. 155.* Western Texas.

## NYCTAGINACEÆ.

ABRONIA CYCLOPTERA, *Gray, in Sill. Jour. (n. ser.) 15; Torr. in Marcy's Rep. t. 18.* Llano Estacado to Fort Chadbourne; April, May. In flower only.

OXYBAPHUS ANGUSTIFOLIUS, *Torr. in Amer. Lyc. New York, 2, p. 237.* On the upper Colorado; April.

OXYBAPHUS HIRSUTUS, *Sweet; Hook. Fl. Bor.-Am. 2, p. 124.* On the Colorado; April.

ACLEISANTHES BERLANDIERI, *Gray, in Sill. Jour. l. c.* On the Pecos; March, Foliage only.

## EUPHORBIACEÆ.

TRAGIA RAMOSA, *Torr. in Ann. Lyc. New York, 2, p. 245.* Gravelly soils; March.

CNIDOSCOLUS STIMULOSUS, *Engelm. and Gray, Pl. Lindl., part 1, p. 26.* Sand-hills of Llano Estacado and Western Texas; March to May. Flowers larger than in the eastern plant.

STILLINGIA LANCEOLATA, *Nutt. in Trans. Phil. Soc., (n. ser.) 5, p. 176.* Sandy soil, Western Texas; April to May.

HENDECANDRA CROTONOIDES, *Hook. and Arn. Bot. Beech, p. 388.* This is the same as No. 1800, *Pl. Wright.* It was found also by Frémont on the Gila. It is quite a distinct species from *H. procumbens.* The Mexicans call it *Yerba del Gato*, and use it as a purgative.

EUPHORBIA ARKANSANA, *Engelm. and Gray, l. c. no. 303.* Intermediate between *E. platyphylla* and *E. Helioscopia.* Sandy soil. Collected in a journey to Fort Chadbourne, and on the head-waters of the Colorado.

EUPHORBIA GEYERI, *Engelm. and Gray, Pl. Lindh. 1, p. 52.* Western Texas; May.

EUPHORBIA WRIGHTII, (n. sp.): stem herbaceous from a somewhat ligneous base, erect, much branched; leaves opposite, sessile, narrowly lanceolate-linear, entire; involucre solitary, pedunculate, mostly terminal or in the uppermost forks of the stem, pubescent; glands transversely oblong, entire, with a large petaloid broadly obovate denticulate appendage; capsule very minutely papillose-pubescent; seeds glabrous. Head-waters of the Colorado; April. This is the same as No. 1827 of Mr. Wright's New Mexican collection, (1851-52). It is about a foot high, branching from the base; the branches green and angular. Leaves an inch or more in length, and 2-3 lines wide. Peduncles variable in length, occasionally 2-3 times longer than the hemispherical involucre, but usually shorter. Petaloid appendages conspicuous. Styles very short, spreading, 2-cleft about half-way down. Capsule coriaceous. Seeds subglobose.

EUPHORBIA ALBOMARGINATA, (n. sp.): perennial, slender, much branched, smooth; leaves stipulate, opposite, suborbicular, subcordate, entire, distinctly petiolate; involucre solitary, shorter



than the peduncles; glands transversely oval, with an entire or slightly crenate petaloid border, which is twice as broad as the gland itself; seeds obovate, somewhat rugose transversely, dull, gelatinous when moistened. In red sand and clay: with the preceding. Resembles the following, but more slender and of a more diffuse habit. It is readily distinguished by the broad petaloid appendages of the involucre glands.

*EUPHORBIA DILATATA*, (n. sp.): whole plant clothed with a soft pubescence; stem much branching from a somewhat woody base, diffuse; leaves without stipules, opposite, ovate, sessile, dilated and somewhat unequal at the base, rather obtuse, entire, (often purplish underneath) thickish; involucre mostly solitary, axillary and terminal, nearly sessile, ovate; glands transversely linear-oblong, with a narrow petaloid crenate margin; capsule somewhat hairy; seeds oblong, even, gelatinous when moistened. Western Texas. Not uncommon in New Mexico. Resembles No. 1840 of Mr. Wright's New Mexican collection, (1851-52); but that is hairy, the leaves are lanceolate, tapering to a mucronate tip, and the petaloid appendages of the involucre glands are much broader.

*EUPHORBIA FENDLERI*, (n. sp.): branching and diffuse from a somewhat woody caudex, smooth; leaves stipulate, opposite, broadly ovate or orbicular-ovate, on very short petioles, subcordate and oblique at the base; involucre solitary, on short peduncles; gland transversely oval, with a narrow entire somewhat 2-lobed border; capsule smooth; seeds obovate, a little rugose transversely, gelatinous when moistened. Big Springs of the Colorado; April. This species is No. 800 of Fendler's New Mexican collection. It is a small plant, throwing off many branches that spread on the ground, forming a little patch from three to six inches in diameter. The leaves are 3-4 lines long, and are often of a purplish tinge, especially underneath.

## SANTALACEÆ.

*COMANDRA UMBELLATA*, *Nutt. Gen.* 1, p. 157. Gravelly soil. Big Springs of the Colorado, &c., Texas; April.

## SALICACEÆ.

*SALIX*. Two undetermined species were found in the sand-hills of Llano Estacado.

## CUPULIFERÆ.

*QUERCUS UNDULATA*, *Torr. in Ann. Lyc. New York*, 2, p. 248, t. 4. Head-waters of the Colorado and Llano Estacado; in sandy soil. In flower April 12.

*QUERCUS PALUSTRIS*, *Du Roi*. Near Fort Chadbourne, Texas.

## URTICACEÆ.

*PARIETARIA PENNSYLVANICA*, *Willd?* Delaware creek to the Pecos; March.

*CELTIS RETICULATA*, *Torr. in Ann. Lyc. New York*, 2, p. 247. Upper Colorado, Texas; April.

*PLANERA RICHARDI*, *Michx. Fl.* 2, p. 248. Western Texas; April.

*MORUS RUBRA*, *Linn.?* Near Fort Washita; April.

## CONIFERÆ.

*EPHEDRA ANTISIPHILITICA*, *Berland.; Endl. Conif.* p. 263. High rocky and sandy places; Llano Estacado and on the Pecos. The fertile aments are 1-2-flowered; but usually perfect only one seed, which in that case is triangular. When two seeds ripen they are less angular, and the opposite faces are flat. The scales of the ament become fleshy at maturity.

*JUNIPERUS VIRGINIANA*, *Linn.; Michx. f. Sylv.* 2, p. 253, t. 155. Head-waters of the Colorado, and in various parts of Western Texas.



## SMILACEÆ.

SMILAX HASTATA, *Willd. Sp. p.* 782; *Ell. Sk.* 2, p. 696. High plains, Llano Estacado.

## COMMELYNACEÆ.

TRADESCANTIA VIRGINIANA, *Linn.; Kunth, Enum.* 4, p. 81. Head-waters of the Colorado and on the Pecos; March and April. Very variable as to size, pubescence, and breadth of the leaves.

COMMELYNA ANGUSTIFOLIA, *Michx. Fl.* 1, p. 24. Near Fort Washita.

## IRIDACEÆ.

SISYRINCHIUM BERMUDIANA, *Linn.; var. anceps. S. anceps, Cav.* Dry soils, Llano Estacado.

## LILIACEÆ.

CAMASSIA FRASERI, *Torr. in Whipple's Report, ined.* Scilla esculenta, *Gawl. in Bot. Mag., t.* 1574; (excl. syn. *Pursh.*)  $\beta$ . angusta. S. angusta, *Engelm. and Gray, Pl. Lindheim., part* 1, No. 198. Western Texas.

ALLIUM MUTABILE, *Michx. Fl.* 1, p. 195. On the Pecos and the head-waters of the Colorado; March to April. Flowers varying from deep rose red to nearly white.

PSEUDOSCORDUM STRIATUM, *Herb.* Nothoscordum striatum, *Kunth, Enum.* 4, p. 458. Allium striatum, *Jacq.* With the preceding.

YUCCA ANGUSTIFOLIA, *Pursh, Fl.* 1, p. 227. On the Pecos; April. Flowers in a long, narrow raceme, as large as in *Y. filamentosa*, greenish yellow mixed with purple.

## JUNACEÆ.

JUNCUS TENIUS, *Willd.; Torr. Fl. New York,* 2, p. 329. Low grounds. Hueco Tanks.

## NARIADACEÆ.

POTAMOGETON PRÆLONGUS, *Wulf.; Gray, Bot. North. States,* p. 456. Western Texas.

## CYPERACEÆ.

SCIRPUS LACUSTRIS, *Linn.; Torr. Cyp.,* p. 321. In water; Llano Estacado; March.

ELEOCHARIS OBTUSA, *Schultes; Torr. l. c.,* p. 302. With the preceding.

## GRAMINEÆ.

CERATOCHLOA UNIOLOIDES, *Beauv. Agrost. p.* 75, t. 15, f. 7. Bromus Willdenovii, *Kunth, Enum.* 1, p. 416. Head-waters of the Colorado; April.

TRIPSACUM DACTYLOIDES, *Linn. fil. Decad.* 17, t. 9; *Steud. Pl. Glum. p.* 362. Llano Estacado. A tall rank grass, affording good fodder.

CHLORIS VERTICILLATA, *Nutt. in Trans. Amer. Phil. Soc. (n. ser.)* 5, p. 143. Sandy plains northeast of the Pecos; April.  $\beta$ ? ARISTULATA; spikes much shorter; awns scarcely half the length of the paleæ; lower glume obovate, rather obtuse. With the preceding. Not uncommon at the lower Rio Grande, where it was collected by Dr. Gregg, who says it is good fodder. The spikes are usually purplish, but sometimes yellowish.

PANICUM PAUCIFLORUM, *Ell. sk.* 1, p. 120? On the Pecos; April.

PHALARIS ANGUSTA, *Nees; Trin. Gram. t.* 78. Head-waters of the Colorado.

POA ARANIFERA, *Torr. in Marcy's Rep. p.* 301. Head-waters of the Colorado; April 13. Also the var.  $\beta$ . With the preceding, and Big Springs of the Colorado.



FESTUCA TENELLA, *Willd. Enum.* 1, p. 116. High sandy plains northeast of the Pecos, and head-waters of the Colorado; March to April.

FESTUCA MACROSTACHYA, (n. sp.) On the Pecos. This is one of numerous Grama-grasses of Texas and New Mexico.

HORDEUM PUSILLUM, *Nutt. Gen.* 1, p. 87; *Kunth, Enum.* 1, p. 457. Sandy soil; Llano Estacado; March.

ELYMUS CANADENSIS, *Linn.; Kunth, Enum.* 1, p. 457. Near Fort Washita.

#### FILICES.

ADIANTUM CAPILLUS-VENERIS, *Linn.* Big Springs of the Colorado. We follow Hooker in uniting this and several other allied forms of Adiantum.

NOTHOCHLÆNA SINUATA, *Kaulf.* Between the Rio Grande and Llano Estacado.

GYMNOGRAMMA TARTAREA, *Desv.* With the preceding.

CHEILANTHES LINDHEIMERI, *Hook. Spec. Fil.* 2, p. 101, t. 107. Llano Estacado. This is the same as No. 2126 of Wright's New Mexican collection.

PTERIS (PLATYLOMA) ANDROMEDÆFOLIA, *Kaulf, Enum. Fil.* p. 188. Hueco Swamps, Texas. This is a common fern in California.

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### EXPLANATION OF THE PLATES.

#### Plate I. SELENIA DISSECTA. Page 160.

Fig. 1, a flower, moderately magnified; fig. 2, a sepal; fig. 3, a petal; fig. 4, the stamens; fig. 5, the young pod; fig. 6, the mature pod—all more magnified than fig. 1; fig. 7, seed, still more magnified; fig. 8, section of the same, equally magnified.

#### Plate II. CALYMMANDRA CANDIDA. Page 166.

Fig. 1, involucre and receptacle; fig. 2, chaff of the pistillate flowers; fig. 3, a pistillate flower; fig. 4, a perfect flower, partly enclosed in its woolly chaff; fig. 5, the same, without the chaff; fig. 6, chaff of the perfect flower; fig. 7, corolla of the perfect flower laid open—all moderately enlarged; fig. 8, a stamen, more magnified; fig. 9, upper portion of the style from a perfect flower, equally magnified; fig. 10, the same from a pistillate flower; fig. 11, achenium, pretty highly magnified; fig. 12, longitudinal section of the same.

#### Plate III. FILAGINOPSIS MULTICAULIS. Page 166.

Fig. 1, involucre and receptacle; figs. 2 and 3, paleæ of a pistillate flower; fig. 4, a pistillate flower; fig. 5, palea of a staminate flower; fig. 6, staminate flower; fig. 7, corolla of the same, laid open and showing the stamens; fig. 8, its abortive style; fig. 9, achenium; fig. 10, vertical section of the same—all the figures variously magnified.

#### Plate IV. STENANDRIUM BARBATUM. Page 168.

Fig. 1, plan of the flower; fig. 2, a flower; fig. 3, the corolla laid open, showing the stamens and pistil; figs. 4 and 5, stamens, shown in two positions—all moderately enlarged; fig. 6, pistil, more magnified, the ovary laid open vertically, showing the ovules; fig. 8, a capsule, moderately magnified; fig. 9, cross-section of the same; fig. 10, a seed, more highly magnified; fig. 11, longitudinal section of the same.



Plate V. *PENTSTEMON FENDLERI*. Page 168.

Fig. 1, corolla laid open, and moderately enlarged; fig. 2, longitudinal section of a flower, more magnified; fig. 3, a perfect stamen, still more magnified; fig. 4, upper portion of the imperfect stamen; fig. 5, pistil, its ovary laid open vertically.

Plate VI. *SALVIASTRUM TEXANUM*. Page 169.

Fig. 1, vertical section of a flower; fig. 2, the calyx laid open; fig. 3, corolla; fig. 4, a stamen; fig. 5, pistil; fig. 6, vertical section of the ovary; fig. 8, vertical section of a seed—all the figures variously magnified.

Plate VII. *STEGNOCARPUS CANESCENS*. Page 169.

Fig. 1, a flower, enlarged; fig. 2, the corolla laid open, showing the stamens and pistil, equally magnified; fig. 3, a stamen, more magnified; fig. 4, pistil, with the ovary cut longitudinally; fig. 5, an ovule, highly magnified; fig. 6, the fructiferous calyx, moderately enlarged; fig. 7, cross-section of the fruit; fig. 8, a nutlet, more magnified; fig. 9, vertical section of the same.

Plate VIII. *PTILOCALYX GREGGII*. Page 170.

Fig. 1, a flower, magnified; fig. 2, the corolla laid open vertically; fig. 3, a stamen, more magnified; fig. 4, the pistil, equally magnified; fig. 5, an ovule, highly magnified; fig. 6, fructiferous calyx; fig. 7, the fruit and persistent style; fig. 8, transverse section of the fruit, showing one perfect cell containing a seed, and three abortive, collapsed cells; fig. 9, embryo—the last five figures moderately magnified.

Plate IX. *EDDYA HISPIDISSIMA*. Page 170.

Fig. 1, leaves, showing the upper and lower surface, magnified; fig. 2, a flower, equally magnified; fig. 3, the corolla laid open vertically; figs. 4 and 5, stamens, front and back views; fig. 6, pistil, with the ovary cut vertically; fig. 7, cross-section of the ovary; fig. 8, fructiferous calyx; fig. 9, a nutlet; fig. 10, embryo.

Plate X. *PHACELIA POPEI*. Page 172.

Fig. 1, flower enlarged; fig. 2, corolla laid open, showing the stamens and pistil; fig. 3, stamens, more magnified; fig. 4, calyx and pistil; fig. 5, pistil, with the ovary vertically divided; fig. 6, transverse section of the ovary; fig. 7, ovule, more magnified; fig. 8, fruit scarcely matured, with the persistent calyx; fig. 9, seed, more magnified; fig. 10, vertical view of a seed transversely divided; fig. 11, embryo, still more magnified.