

# LIST OF PLANTS COLLECTED BY DR. EDWARD PALMER IN LOWER CALIFORNIA IN 1889.

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In volume XI of the Proceedings of the U. S. National Museum we published an account of the plants of San Quentin and a partial report on those collected about Lagoon Head. The present paper will begin with the Lagoon Head plants, and will include a list of the species of Cedros, San Benito, and Guadalupe Islands. Mr. T. S. Brandegee, of the California Academy of Science, collected over some of the same ground visited by Dr. Palmer, and has rediscovered several of the new species described in the former paper. And now several of the species recently described by him are included in the present list. We are indebted to a number of botanists for assistance in the working up of these plants; especially to Dr. Sereno Watson, who has carefully looked over doubtful forms, and to Mr. William Canby, who has generously loaned us many specimens. Other botanists who have aided us in identifying species will be referred to in the proper place. In this paper we give reference to the first publication of the species, under the genus in which it is now included, when not found in the Botany of California or Gray's Syn. Flora.

## PLANTS OF LAGOON HEAD.

A partial list of the plants of this region has been published in the Proceedings of the National Museum, vol. xi, pp. 534-536.

Lagoon Head, Lower California, the Cabo Negro of the old Spanish charts, is a high, dark-colored headland of volcanic origin; its highest point is 475 feet above high-water mark, and in clear weather it can be seen at a distance of 30 to 40 miles, presenting the appearance of an island.

**794. *Eschscholtzia peninsularis* Greene.** Bull. Cal. Acad., I. 68. In the sand plain back from the ocean. Only a few plants found in bloom.

**823. *Eschscholtzia minutiflora* Watson.** Found in a cañon 30 miles inland, growing in sandy soil; "roots quite red." If this is correctly referred, the range of the species is extended considerably southward.

834. *Biscutella Californica* B. & H. Mr. Watson thinks this may be distinct from *B. Californica*. Dr. Palmer reports it very common on the sandy hills and plain near the beach. The "yellowish white" becoming purple in drying.
815. *Arabis pectinata* Greene. Pitt. I. 287. This recently described species of Mr. Greene was collected this season by Lieutenant Pond at San Bartolome Bay and also on Cedros Island by Dr. Palmer. Collected on sandy spot among hills 40 miles back from the ocean. "Bloom white changed to mauve by age."
821. *Sisymbrium Brandegeana* Rose, n. sp. Annual, glabrous, slender, simple or branching, 6 to 15 inches high: leaves small (1 to 2 inches long), pinnately divided into a few filiform segments: petals one and one-half lines long, twice the length of the sepals, white: pods three-fourths of an inch long, terete, horizontal, or sometimes becoming reflexed, sometimes straight but mostly curving upward, tipped with a thick, obtuse style (one line long), on short pedicels. Common in shady soil about the beach.
767. *Drymaria viscosa* Watson. Proc. Amer. Acad., XX, 467. A very common plant on sandy places near the ocean. The plants grow in great mats covering the sand. Only before collected by Mr. C. R. Orcutt in northern Lower California and by Mr. Brandegee at Magdalena Island and San Gregoria. Dr. Palmer has collected a large quantity of this plant.
765. *Erodium Texanum* Gray. Common on gravelly hills.
818. *Fagonia Californica* Benth. Grows among rocks in a cañon 30 miles inland.
827. The same. But three plants found on the hills near the beach.
829. *Phaseolus filiformis* Benth. Very common on the sand hills near the beach.
797. *Lupinus Arizonicus* Watson. Common on the sand plains back of the beach. Some flowers are white, others are drab-colored.
790. *Calliandra Californica* Benth.
776. *Astragalus triflorus* Gray. Very abundant near the beach.
791. *Hosackia glabra* Torr. A very common plant 40 miles inland, grows compact.
777. *Hosackia maritima* Nutt. Sandy, level places, 15 miles from the sea; bloom yellow.
820. *Hosackia rigida* Benth. Stems flexuose, much branched at base; leaves sessile, with small leaflets. Poduncles long (2 to 4 inches). Pods almost terete,  $1\frac{1}{2}$  to 2 inches long. Found in a cañon 30 miles inland. The plant most resembles Palmer's (175), 1876, from Arizona.
813. *H. Bryanti* Brandegee. Proc. Cal. Acad., 2d. ser. II, 144.
769. *Oenothera crassifolia* Greene. Bull. Cal. Acad., I. 156. Stems annual or biennial, glabrous and very glaucous; leaves linear or narrowly lanceolate, entire or sinuately toothed. Capsule linear, much contorted. We have not seen Mr. Greene's type, but the plant does not seem to be the same as Orcutt's specimens. Very common on the sand hills and depressions near the beach. "Showy colored flowers," more or less purplish on drying.
772. *Oenothera septostigma* Brandg. Proc. Cal. Acad., 2nd. ser. II, 156. Sandy plains; 10 miles inland. Part of type.
771. *Oenothera angelorum* Watson. Proc. Amer. Acad., XXIV. 49. Forty miles inland.
768. *Filago Arizonica* Gray.
773. *Vigulera Purisimae* Brandigeo. 2d. ser. II. 173.
- Franseria dumosa* Nutt. This is the same as Palmer's 559 (from Los Angeles Bay, 1887). The leaves are much more coarsely cut, and the spines hardly flattened and hooked at tip. A compact plant 2 feet high, abundant on the hills near the sea.
770. *Franseria Bryanti* Curran.

793. *Viguiera laciniata* Gray. Three to four feet high. In stony ravines 30 miles back from the ocean, and there common.
826. *Helianthus dealbatus* Gray. Clearly an annual; quite common on the sand hill near the beach, growing thickly together. This is the most southern station of this species. Besides the station given in Syn. Flora, is to be added Orcutt's *Locovrs* (1886) plant; also at Ensenada and recently Santa Margarita Island, by Mr. Brandegee. For this species Mr. Brandegee takes up Bentham's old specific name of *Encelia nivea* and writes *H. niveus*.
822. *Encelia frutescens* Gray. Common on the hills 40 miles back from the ocean; 3 to 4 feet high.
828. *Encelia Ventorum* Brandegee. Proc. Cal. Acad., 2d. ser. ii, 175.
795. *Leptosyne parthenioides* Gray. Var. *dissecta*, Wat. Proc. Am. Acad., XXIV, 36. Dr. Palmer says this plant has a wide range on the sandy plains and hills. Seen 40 miles back from the ocean; bloom at first white, but soon becoming purplish. The margin of the akenes are incurved in age, with no pappus, muciculate on the back. The only other collection of the species, that we know of, is that of Palmer at Los Angeles Bay. This plant Dr. Watson took to be the *Acoma dissecta* of Benth., but the rediscovery of that species by Mr. Brandegee the past season shows that they are not the same. Therefore Palmer's Los Angeles plant is the type of *L. parthenioides* var. *dissecta* Watson, and is not to be confounded with *L. dissecta* Gray.
787. *Amblyopappus pusillus* H. & A. Very abundant on hills.
782. *Eriophyllum lanosum* Gray.
778. *Chænactis lacera* Greene. Pitt., V, 29. This species was first collected by Lieutenant Pond, at San Bartholome Bay, in March, 1889. Dr. Palmer collected it about the same time in considerable quantity. It grows in low sandy places near the ocean. Said to be a very fleshy plant. The stems and leaves purplish. "Bloom white" or turned by age to rose.
786. *Dysodia anthemidifolia* Benth. First collected by the Sulphur, also Dr. Streets, recently by Lieutenant Pond, at San Bartholome Bay, and Brandegee. Very common on the sandy plains, near the sea-beach, and extending for miles back from the ocean. Dr. Palmer says it is a showy plant for cultivation, with bright amber-colored flowers and an odor like the African Marigold.
817. *Malacothrix Californica* D. C. Flowers "showy, yellowish white." Outer pappus three to four persistent bristles. Sometimes with branching scapes. Lemmon also collected such a form in 1875. So far as we know this species has not before been found out of California. Dr. Palmer reports it very common in the sand-hills about the bay.
814. *Philbertia linearis* Gray. A small trailing plant about 3 feet long, twining about bushes or prostrate on the ground, often rooting at the nodes. The older stems develop a very thick corky bark. The whole plant is glabrous, except the inflorescence, which is very pubescent. The flowers are "canary white."
774. *Gilia Jonesii* Gray. Only a few plants seen and these all collected in the hilly country, 40 miles from the ocean. This species is only known from Jones's specimen from the Needles, southeast California (1884). We have not yet seen the type, but the species certainly goes into the section *Linanthus*, and there is nothing in Gray's meager description to keep it out of *G. Jonesii*.
780. *Krynitzkia intermedia* Gray. A very common plant 25 miles from the ocean.
781. *Krynitzkia maritima* Greene. The nutlets often of two kinds, both maturing. The glabrous nutlets acute on the edge. The leaves often broader at the base.
829. *Rumex hymenosepalus* Torr. Called "Yerba Colorado." Much used as a medicine, especially in venereal diseases, flesh wounds, etc. The young tops sometimes used as greens in California.

- 788.\* *Argythamnia serrata* Muhl. Var. *Magdalenæ*, Millsp. Proc. Cal. Acad. 2d. ser., ii, 221. Found in sandy places between the hills contiguous to seabeach; has very long roots.
785. *Stillingia linearifolia* Watson. Grows in the hollows between hills near the sea beach among shrubs and plants, loose grower.
783. *Euphorbia polycarpa* Benth., var. *vestita* Watson. Hills 40 miles back from the ocean. Plants quite scattering.
789. *Euphorbia Pondii* Millspaugh, sp. nov. Annual, prostrate, spreading from the base. Stems glabrous, (3 to 6 centimeters long), dichotomously branching. Leaves ovate, obtuse, entire, ( $1\frac{1}{2}$  to 3 millimeters long, 1 to 2 millimeters broad); petioles hairy, (one-fourth to three-fourths the length of the blade); stipules large, bluntly triangular, margined with two to four fascicles of ciliae. Inflorescence solitary in the upper axils, and terminal upon the youngest branchlets; involucre turbinate, sessile, slightly hairy; glands four, transversely ovate, minute, dark red; appendages minute, white, orbicular, deeply two crenate-toothed on the margin, or wanting; styles bifurcate to the middle. Capsule trisulcate; carpels carinate and slightly tuberculate; seeds elongated, quadrangular, ferruginous between the angles. Described from a specimen collected at Plaza Maria, Lower California, in 1889, by Lieut. Chas. F. Pond, U. S. Navy; also Gaudalupe Island by Palmer. A form with smooth capsules and more turgid seeds is in this collection. Hills 40 miles back from sea beach, the plants have a yellow shading when fresh.
792. *Euphorbia Xanti* Engl. Typical specimens of both sorts, the white and the red appendiculate, that prove the shrubbiness of the species. Abundant, 25 to 40 miles back from the ocean; loose grower, pinkish-white flowers. Sometimes old plants are met with that have deep, rose-colored flowers.
775. *Chorizanthe Vaseyi* Parry & Rose. Bot. Gaz., XV, 64. A figure of this plant accompanies the description. Among hills, 40 miles inland.
779. *Allium Californicum* Rose, n. sp. Bulbs cespitose, narrowly oblong with dark red coats, deep seated (3 to 4 inches), scapes terete, 3 to 5 inches high: leaves three to five, linear, mostly shorter than the scape: spathe two-valved and these ovate, acute: umbel somewhat open, four to five rayed: pedicels 5 to 8 lines long: flowers "dark mauve color," with lanceolate-acuminate segments: stamens and style included: capsule obtuse, with two ovules in a cell, but one (rarely two) of the ovules mature.  
A species closely related to *A. hematochiton*, Wat. Hilly country 40 miles back from the ocean; "Grows in stiff clay; odor strong of onions."
654. *Aristida Californica* Thurb. This peculiar grass grows in small, compact bunches. It has a wide range on sandy soil and gravelly hills. It is the only grass in this section which affords forage for wild or domestic animals, and as it is generally found (as shown by many of these specimens) denuded of its leaves, while the flowers and seed-tops remain intact, the inference would be that wild animals (domestic animals are few here) crop the leaves while the grass is tender.
655. *Festuea tenella* Willd. Var. (very small.) A common grass, especially where water is retained in sandy arroyos and plains. Seldom found with the appearance of having been cropped by animals.
651. *Aristida bromoides* H. B. K. Common on sandy slopes and places where moisture is retained, growing so thickly that they seem sown for a lawn.
652. *Triodia pulchella* H. B. K. Found in tufts on a gravelly ridge.
653. *Muhlenbergia debilis* Trin. These, the only ones found, were associated with 651.

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\* *Euphorbiaceæ* determined by C. F. Millspaugh.

## CEDROS ISLAND PLANTS.

Dr. Palmer spent three days on the north end of this island, March 18 to 20, and made a large and valuable collection. His numbers run from 677 to 764, and unfortunately are partly duplicated in the San Quentin collection of the same year.

Mr. Greene has published (*Pittonia*, vol. 1, 200-208) a list of the known species of this island, and also a supplement (*l. c.* 266-269) listing ninety-one species. Dr. Palmer has added at this time forty-three species to the flora of the island. Dr. Streets, who visited this island in 1876, and made a small collection, found here *Abutilon Lemmoni*, which has not been since rediscovered. Mr. Belding has also collected here, but not very extensively. The species now known to the island are one hundred and thirty-five.

For convenience we give here all the species not given in Mr. Greene's list, and we also add in parenthesis, his number after species found in his list:

<i>Draba Sonoræ</i> Greene.	<i>Sonchus tenerrimus</i> Linn.
<i>Lepidium Menziesii</i> D. C.	<i>Sonchus oleraceus</i> Linn.
<i>Arabis pectinata</i> Greene.	<i>Ellisia chrysanthemifolia</i> Benth.
<i>Thysanocarpus</i> sp.	<i>Phacelia Cedrocensis</i> Rose.
<i>Polycarpon depressum</i> Nutt.	<i>Pectocarya linearis</i> D. C.
<i>Zizyphus Parryi</i> Torr.	<i>Plagybothrys Cooperi</i> Gray.
<i>Abutilon Lemmoni</i> Wats.	<i>Nicotiana Greeneana</i> Rose.
<i>Lupinus</i> sp.	<i>Antirrhinum Watsoni</i> Vasoy & Rose.
<i>Hosackia maritima</i> Nutt.	<i>Antirrhinum subsessile</i> Gray.
<i>Phaseolus filiformis</i> Benth.	<i>Parietaria debilis</i> Forst.
<i>Astragalus</i> sp.	<i>Pterostegia drymarioides</i> F. & M.
<i>Fillea</i> sp.	<i>Atriplex</i> , n. sp.
<i>Mentzelia adherens</i> Benth.	<i>Atriplex microcarpa</i> Dietr.
<i>Apiastrum angustifolium</i> Nutt.	<i>Aphanisma blitoides</i> Nutt.
<i>Filago Arizonica</i> Gray.	<i>Ephedra</i> sp.
<i>Gnaphalium Sprengelii</i> H. & A.	<i>Trisetum barbatum</i> Steud.
<i>Perityle Grayi</i> .	<i>Melica imperfecta</i> Trin.
<i>Encelia Cedrosensis</i> Rose, n. sp.	<i>Stipa eminens</i> Cav.
<i>Amblyopappus pusillus</i> H. & A.	<i>Muhlenbergia debilis</i> Willd. var.
<i>Senecio sylvaticus</i> Linn.	<i>Festuca tenella</i> Willd.
<i>Rafinesquia Californica</i> Nutt.	<i>Agrostis verticillata</i> Trin.
<i>Microseris linearifolia</i> Gr.	<i>Cheilanthes Brandegei</i> Eaton.

723. *Draba Sonoræ* Green. Only one plant seen on the side of a cañon. Not before found on the island.
726. *Sisymbrium canescens* Nutt. Only one small plant seen in a cañon. Mr. Greene found only a single specimen. (No. 2 of Mr. Greene.)
709. *Lepidium Menziesii* D. C. In exposed places. Not before reported from here.
717. *Arabis pectinata* Greene. Pitt., 1,287. Recently described by Mr. Greene from specimens from San Bartholome Bay, Lower California. Somewhat common but scattering.
686. *Thysanocarpus* sp. Smooth and a little glaucous, 3 to 12 inches high: leaves 5 to 10 lines long, ovate to narrowly lanceolate, entire or toothed, auricled at base: flowers rose-colored: sepals less than one-half line long: petals of same length as sepals, spatulate, obtuse: two of the stamens united, style wanting: pods oval, 2 lines in diameter, smooth or pubescent, the wings thin, not nerved, purple, emarginate at both ends.

Only a few plants found and these on a level place. First described and distributed as *T. Palmeri*, but since Mr. Watson has written that it is probably his "*T. erectus* described from miserable material."

747. *Isomeris arborea* Nutt. Plants about 4 feet high. (No. 3 of Mr. Greene.) Also collected by Lieutenant Pond this season. Mr. Greene considered that this species belongs to *Cleome* and calls it *C. isomeria*, Pitt. i, 200.
699. *Frankenia Palmeri* Watson. Common plant near the sea-beach. (No. 5 of Mr. Greene.)
713. *Polycarpon depressum* Nutt. Collected only by Nuttall and Lemmon, in southern California, although various things have been distributed as this species, even *Tillaea minima* and *Achyroxychia Cooperi*. Found under pine trees at the highest point on the north end. (Altitude, 1,761 feet.)
699. *Sphæralcea*\* *fulva* Greene. Pitt. i, 201. Only three specimens found and these in flower. Collected by Dr. Streets in 1876. (No. 6 of Mr. Greene.)
752. *Ziziphus Parryi* Torr. *vide* Trelease. The following is Dr. Palmer's note. "A very thorny shrub, 2 to 3 feet high, with numerous crooked branches, forming a compact plant, good for a hedge. The fruit when ripe may be yellow, as that color was indicated in some of the fruit seen." In cañons and mountain sides apparently not collected before.
738. *Rhamnus crocea* Nutt. "The more acute leaved sharply toothed form," Trelease in lit. An upright growing shrub 6 to 8 feet high. In cañons. (Probably No. 7 of Mr. Greene.)
730. *Rhus Lentii* Kell. Proc. Cal. Acad., ii, 16. A large shrub 5 to 6 feet high in cañons. "A profuse bloomer; crimson colored to white; fruit shiny, as if iced over." Fruit a half inch long. (No. 9 of Mr. Greene.) Also collected by Lieutenant Pond this season. By Dr. Veatch, in 1859.
735. *Rhus integrifolia* B. & H. Dr. Palmer says of this plant, "An irregular growing shrub, with short body and stiff limbs." Much used by the fishermen for fuel, for which it is very good. In cañons. (No. 10 of Mr. Greene.)
682. *Veatchia Cedrosensis* Gray. Dr. Palmer's notes are as follows: Not found in bloom or fruit. A dwarf tree 5 to 6 feet high, dotted here and there over the north end of the island. The wood is soft and spongy, shrinking when cut, leaving little but the bark. Mr. Brandege has identified this plant with the *Schinus aiscolor* Benth. Bot. Sulph., p. 11, and has collected it from the original station (Magdalena Bay.) In Proc. Cal. Acad., 2d ser., 2, 140, he considers it a good *Veatchia* and taking up the oldest specific name, writes it *Veatchia discolor*. He also refers here *Bursera pubescens* Watson. (No. 8 of Mr. Greene.)
721. *Lupinus* sp. This is the same as our 666a (distributed as 708) of former paper. The plants are often smaller, the flowers larger (5 lines long), scattered or somewhat verticillate; the bracts tardily deciduous; pods four to six seeded. Found on hill sides and cañons. A very showy plant "bloom purple upper lobes yellow." As we noted before, our plant seems nearest *L. Arizona*, but it hardly answers for that and perhaps should be made distinct.
736. *Hosackia maritima* Nutt. The flowers are only 2 lines long; the pods few seeded. This is the same as the San Quentia 669a. Not before found on the island.
698. *Hosackia nudata* (Greene). We have not seen Mr. Greene's type, and yet there is little doubt but that this is his *Syrmatium*. Our plant is larger, with many slender weak branches; the leaflets sometimes larger (3½ lines long), often obtuse, glabrate in age. Although many of the short peduncles bear but one to two flowers, yet it is not uncommon to find three, four, and sometimes five flowers in the umbel. The species of *Syrmatium* form a strongly marked

\* Another of the *Malvaceæ* belonging to the island not reported by Mr. Greene or found by Dr. Palmer, is *Abutilon Lemmoni*, collected by Dr. Streets in 1876.

section of *Hosackia*, and it is an open question whether it should not be kept distinct. Mr. Greene (in vol. ii, Bull. Cal. Acad.) thinks it should be, and ably defends Vogel's genus. Mr. Watson, while saying it might well be considered generically distinct, still retains it under *Hosackia*, and the same course is followed by Mr. Brandegee in his recent paper. The discovery of a number of species belonging to this in late years would seem to emphasize the independence of the section. If it is so to be considered, the two recent species of the authors (published in Proc. Nat. Museum, vol. XI, pp. 528, 529) should be referred to as *S. Watsoni* and *S. Palmeri*. However, in the present uncertain limitations of the genus, we accept the limits of Bentham and Hooker in Gen. Plant, followed by Mr. Watson, in Botany of California.

- 733. *Phaseolus filiformis* Benth.** Bot. of Sulphur, p. 13. This was collected in 1875 by Dr. Streets, and this season by Lieutenant Pond. Found in exposed places facing the ocean; "Bloom, white." The plant has been collected near the United States boundary by Oreutt in northern Lower California; also at Carmen Island (Palmer, 1875); Guaymas, Mexico, Palmer, 1887; Xantus, 1859, and by Brandegee, in Lower California.
- 727.** The same; mouth of cañon; "bloom rose-colored."
- 744. *Dalea Benthami* Brandg.** Proc. Cal. Acad. 2nd ser. ii, 148. As already pointed out by Mr. Greene this plant differs from the *D. megacarpa* in its persistent stipular spines, the spikes are shorter and not so close, the terminal leaflet retuse; "bloom, yellow." A compact plant one foot high. (No. 16 of Mr. Greene.) Collected by Lieutenant Pond, 1889, and distributed by Mr. Greene as var. *biuncifera* Greene, and also in this collection.
- 683. *Astragalus fastidiosus* Greene.** Bull. Cal. Acad., I, 186. Common in cañons in moist places; bloom "carmine-yellow." Mr. Watson writes, "one good character has not been noted, the articulation of the pod on the stipe, which also occurs in one or two other species." (No. 12 of Mr. Greene.)
- 685. *Astragalus insularis* Kell.** Bull. Cal. Acad., I, 6. Before known only from the specimens collected by Dr. Veatch in 1859, the species not being described until 1877. Only a few specimens were obtained at this time, mostly in fruit. It is to be regretted that a larger collection had not been made of this rare and little known species. It grows in exposed places near the sea. (No. 13 of Mr. Greene's list, but not found by him.)
- 692. *Astragalus* sp.** Annual; much branched and spreading at base, more or less pubescent; branches slender: leaflets seven to eleven, 1 to 2 lines long, retuse or sometimes linear, acute, and 3 lines long: flowers, one to three, minute, (less than 2 lines long): peduncles 10 to 20 lines long: pods 3 to 5 lines long, slightly pubescent; the dorsal suture intruded, except near the apex; one-celled, incurved and reticulated. We have distributed this as *A. Cedro-censis*, but Mr. Watson thinks it is *A. Nuttallianus*, D. C., but pods always one-celled, etc. Growing on level places facing the sea. "Bloom pale-blue.
- 708. *Tillæa leptopetala*, Benth.\*** It seems to us that this species should be separated from *Tillæa minima*. It is probably *T. leptopetala* of Bentham, but the

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\* Collected also by Palmer at Guadalupe Island. "Among plants in cañons. The specimens are very red." (No. 900.) The typical form of *Tillæa minima* Miers was collected by Dr. Palmer, at San Quentin, in February, 1889, and distributed as No. 713 in part, and No. 714. A third species of *Tillæa* proper, *T. connata* Ruiz et Pav. Fl. Per. and Chil. I, 70, is to be added to our North American flora. The plants are larger than *T. minima* and not diffusely branched. The sepals almost a line long, ovate acuminate; the petals almost filiform. Collected also by Dr. Palmer at San Quentin (713a), growing with *T. minima*. Our plant seems to be the same as the one collected under the United States exploring expedition of Captain Wilkes, in Peru, and referred here by Dr. Gray, page 688. He considered it distinct from *T. rubescens* H. B. K., but if the same it must still give place to *T. connata*, the older name.

stems are quite red, while Bentham says of this species "specimina haud rubescent," and was collected near the San Francisco Bay. The stems are mostly single and erect, or sometimes with a few branches; flowers glomerate in the axils of the connate leaves, nearly sessile; the sepals narrower and more acute; seeds always two in each carpel. Shady spots in cañons.

- 753. *Eucnide cordata*** Kell. Curran, Bull. Cal. Acad., I, 137. A loose growing plant about 4 feet high; "bloom yellowish-white." At mouth of cañon. Collected by Dr. Veatch in 1859. (This is Mr. Greene's No. 20); he considers it a *Mentzelia*, to which genus Kellogg first referred it. Mr. Watson thinks, however, that the two genera should be kept separate.
- 751. *Petalonyx linearis*** Greene. Bull. Cal. Acad., I, 188. Found in a ravine, apparently common. About 2 feet high; "bloom white." (No. 21 of Mr. Greene.)
- 712. *Mentzelia adherens*** Benth. Both of Sulphur, p. 15. This plant differs somewhat from Palmer's 1887 plant, referred to this species by Mr. Watson. The sepals are larger, their margins involute in age and rigid. Capsule not angled, of a different texture; the seeds are grayish and much wrinkled. Not given in Mr. Greene's list, but collected by Dr. Streets in 1876. "Bloom canary color." In exposed places.
- 719. *Echinopepon minima*** Wat. Proc. Amer., Acad. XXIV, 52. Stems glabrous slender, 4 to 5 feet long, climbing over small bushes: leaves thin, smooth below, white-papillose and scabrous above, triangular-cordate, more or less three-lobed, 1 to 1½ inches long. Sterile racemes (including peduncle) 3 to 4 inches long: limb of the flower 4 lines broad, peduncle 6 lines long: fertile flowers mostly solitary, the peduncle becoming 8 to 9 lines long, fruit 6 to 9 lines long (not including the beak), echinate with spine-like processes, two celled, dehiscing by a deciduous operculum: cells three to six seeded, 1½ lines long, compressed, dark-colored.
- By a slip of the pen Mr. Watson has reversed the character of the surface of the leaf, and Mr. Cogneaux has copied the mistake into his monograph. Vol. III, 805. At the mouth of a cañon. Mr. Watson in Torrey Bull., vol. XIV, has re-established Naudin's genus, separating it from *Echinocystis* into which B. & H. had thrown it, followed by Cogneaux, in *Monographie Phanerogamarum*, vol. III. Our plant is the same as Dr. Streets, from Cedros island (1866).
- 693. *Mamillaria Goodridgii*** Scheer. Our specimen is doubtfully referred to this species.
- 679. *Apiastrum angustifolium*** Nutt. Growing in shady cañons. Not before reported from here, and the only known Umbellifer on the island.
- 689. *Bigelovia veneta*** Gray. Only a few plants collected. The whole plant very glutinous. (No. 34 of Mr. Greene.)
- 705. *Filago Arizonica*** Gray. Side of cañon in moist shade. Not before found here.
- 750. *Gnaphalium Sprengelii*** H. & A. A few specimens found in a deep cañon. Not before reported from here.
- 731. *Franseria chenopodifolia*** Benth. Very common. (No. 36 of Mr. Greene.)
- 757. *Franseria camphorata*** Green, var. *leptophylla*, Gray. Proc. Amer. Acad., XXII, 309. Very common; a foot or so high. No 37 of Mr. Greene. The variety also collected near San Fernando, Lower California, by Orcutt, (1886). First collected on Guadalupe Island.
- 743. *Viguiera lanata*** Gray. Very common plant on the island, and a large quantity collected in full bloom. Collected by Veatch, Streets, Belding, and Greene (No. 42.)



741. *Encelia Cedrosensis* Rose n. sp. Shrubby, 4 feet high, somewhat scabrous throughout: leaves opposite, sometimes alternate above, shining, ovate-lanceolate, entire or repandly, toothed, 2 to 3 inches long, on short, slightly winged petioles: heads (6 lines high) numerous, corymbose: involueral bracts short and broad, the inner ones acutish, hirsute on the margins, rays small and narrow, mostly shorter than the disk flowers: akenes 2 to  $2\frac{1}{2}$  lines long, broadly obovate, hirsute, with two long slender persistent awns, over 3 lines long. In cañons.
702. *Encelia Californica* Nutt. Form, *vide* S. Watson. Very shrubby below, a compact plant about 2 feet high. Grows in exposed places. Collected by Dr. Streets in 1875, but only in flower. Dr. Pond has collected the same on the south end of the island, which Mr. Greene considers *E. conspersa*, Benth. Mr. Brandegee has recently collected at the original station (Magdalena Bay) what he considers Bentham's plant. We have not seen his specimens. (87 of Mr. Greene.)
734. *Encelia stenophylla* Greene. Bull. Torr. Club. x, 41. Very common.
701. *Perityle* Greenei. Rose, Bot. Gaz., XV, 117.
701. *P. Grayi*. Rose, Bot. Gaz., XV, 118.
700. *Eriophyllum confertiflorum* Gray. Common on most elevated places among shrubs. (No. 46 of Mr. Greene.)
687. *Amplyopappus pusillus* H. & A. Not before reported from here, but apparently common.
697. *Porophyllum gracile* Benth. Small and compact. Found at the mouth of a cañon. Has the strong aroma of the cultivated rue. (No. 45 of Mr. Greene.) Collected also by Lieutenant Pond this year.
696. *Bebbia juncea* Greene. Common in cañons (No. 39 of Mr. Greene.)
724. *Senecio sylvaticus* Linn. Only two small plants seen on mountain slope near the base. Not before found on the island.
678. *Senecio Cedrosensis* Greene. Bull. Cal. Acad., I, 194. Rather compact growing plant with small green leaves, and sulphur-colored flowers; a good bloomer; grows in elevated places and cañons. Not before found in flower; rays 8, small; akenes puberulent. (No. 47 of Mr. Greene.)
694. *Trixis angustifolia* D. C. Rather common. (No. 48 of Mr. Greene.)
760. *Rafinesquia Californica* Nutt. Not common; in cañons among other plants. Not before found here.
761. *Microseris linearifolia* Gray. In cañons in shade of bushes.
762. *Malacothrix Clevelandi* Gray. Dr. Palmer reports this species common in cañons among rocks and bushes. Mr. Greene only found a few plants in 1885. (No. 50.)
759. *Sonchus tenerrimus* Linn. Shady side of cañons and under bushes. More common than the next.
759. *S. oleaceus* Linn., in part. With the last.
718. *Gilia Veatchii* Parry. Bull. Cal. Acad., I, 198. Very common. Collected by Dr. Veatch, in 1859, (No. 53 of Mr. Greene.) Dr. Palmer says flowers "yellowish white".
716. *Ellisia chrysanthemifolia* Benth. A few specimens collected; flowers white. New to the island.
758. *Phacelia ixodes* Kellogg. Perennial, but sometimes blooming the first year. Three feet or so high, very viscid, glandular: the lower leaves 6 to 10 inches long, the inflorescence a scorpioid panicle: corolla open: the stamens and style exerted: the capsule sometimes as long as the calyx.  
Collected at the very summit of the north end, but also in cañons below. "Bloom lilac color." Collected by Dr. Veatch; (No. 55 of Mr. Greene.)

The Cedros Island plant differs from Orcutt's All Saints' Bay plant of the Syn. Flora, and Palmer's Coronados Island plant. The plant is smaller, less viscid; the corolla smaller, less open, the style and stamens included, the capsule shorter than the calyx, the appendages large, somewhat reflexed. Palmer's Coronados Island plant grows along the beach under the influence of the sea water. And Mr. Orcutt writes that the same is true of his plant.

- 715. Phacelia (Eutoca) Cedrosensis** Rose n. sp. Very hispid with slender bristles, also a little viscid in the inflorescence: stems 1 to 6 inches high, simple or somewhat branched: leaves pinnate, the segments entire or few toothed, inflorescence somewhat crowded, mostly geminate: flowers almost sessile: calyx parted almost to the base, its lobes linear or oblanceolate, 3 lines long, delicately three-nerved: corolla bluish, campanulate, about the length of the sepals: stamens barely exerted; appendages long and narrow, united to the stamens at base: style cleft for one-third its length; capsule one and one-half lines long, obtuse: seeds twelve to eighteen. Seemingly nearest *P. hirtuosa* of Lower California. Found in the shade of bushes in cañons. Not very common. A species peculiar in its dense bristles.
- 691. Krynitzkia maritima** Greene. Stems very much branched.
- 690.** The same with longer narrowly-lanceolate leaves, much resembling the *K. ramosissima* of Palmer's, Los Angeles Bay, 1887. Always one glabrous nutlet, with one or all the others maturing, but different, as described by us in a former paper.
- 722. Pectocarya linearis** D. C. A single specimen found under pines at the summit of the highest peak (1,761 feet), north end. New to the island. The nutlets differ somewhat from most specimens seen, but much resemble *P. linearis*, var. of Lemmon (1884), Arizona.
- 711. Plagybothrys Cooperi** Gray. A few plants found on the highest point of the island. The stipe to the nutlet, only about half as long as in our San Quentin plant. New to the island.
- 745. Physalis Greenei.** Only one small plant found. This is very close to Palmer's 682, from San Quentin, and the close resemblance of the latter to Dr. Streets's Cedros Island plant, we pointed out in our former paper. Proc. U. S. Nat. Mus., vol. XI, 533. *P. pedunculata* Greene non Mart. et Gal. The San Quentin plant Mr. Greene writes is his *P. muriculata*.
- 740. Lycium Cedrosensis** Greene? A few sterile branches.
- 732. Nicotiana Greeneana** Rose n. sp. Somewhat viscid, pubescent, 4 to 9 inches high, simple or little branched at base: lower leaves oblong to lanceolate, 1 to 2 inches long, petioled: the upper ones linear: calyx lobes unequal, the longer about the length of the tube: corolla yellowish white, 5 to 8 lines long, a little constricted at the orifice, its limb 2 to 3 lines broad: the stamens equally inserted low down in the tube: capsule four-valved, longer than the calyx tube. This species seems nearest *N. Clevelandi* in its leaves and calyx, but the corolla is more like *N. trigonophylla*. It seems quite distinct from either. Not very common. Dr. Palmer says in his note respecting this plant, "All the plants seen were taken; not very sticky, nor had the plants but a faint odor like that accompanying the handling of tobacco."
- 714. Antirrhinum Watsoni** Vasey & Rose. A small form, 3 to 8 inches high with linear leaves, "corolla purple." Very rare. At the north end in the shade of bushes in ravines. Not before collected on the island. Mr. Brandegee, in his paper on the "Plants of Baja, California" gives two additional stations, viz: Magdalena and Santa Margareta Islands. The species is doubtless common and of a wide range.
- 725. Antirrhinum subsessile** Gray? Only three small plants found in the shade; 2 to 8 inches high. In fruit, no flowers. At least new to the island.

720. *Galvesia juncea* Gray. Collected by Dr. Streets in 1875 (No. 56 of Mr. Greene); Lieutenant Pond (1889). Grows in large bushes 5 feet high. Described in Syn. Flora as being only 2 feet high.
681. *Mimulus cardinalis* Dougl. Hort. Trans. xi, 70. Only a single specimen collected. (No. 56 of Mr. Greene.)
- 739a. *Pentstemon cedrosensis* Kellogg. Proc. Cal. Acad. xi, 19. Collected by Dr. Veatch in 1859, and the flowers described as yellow. Mr. S. Bolding obtained it here in 1881, and Dr. Gray described it as *P. brevilabris* with a white (?) corolla. In dried specimens the corollas have a yellow or deep orange color. Dr. Palmer's field-note says, "bloom scarlet; very showy," very common in cañons near the ocean. (No. 55 of Mr. Greene's list.)
728. *Mimulus glutinosus* Wendl. Only three plants seen; flowers only 1 inch long; "bloom amber color." Mr. Greene thinks this plant is distinct from those of the mainland. Collected by Dr. Veatch in 1859. (No. 57 of Mr. Greene.)
677. *Verbena lilacina* Greene. Bull. Cal. Acad., I, 212. Ravines; "rather showy plant, abundant bloomer of a lilac color and very fragrant." Collected first by Mr. Greene, 1885. (No. 62.)
684. *Salvia cedrosensis* Greene. Bull. Cal. Acad., I, 212. Common plant on the island. A mere fragment was collected by Dr. Veatch. (No. 61 of Greene.) Only known to the island.
746. *Teucrium glandulosum* Kell. Proc. Cal. Acad., II, 23. First collected by Dr. Veatch in 1859. (No. 60 of Mr. Greene.) Common in deep shady cañon. "Flowers white with pink shading." Only known from the island.
680. *Parietaria debilis* Forster. Among rocks and bushes in cañons.
703. *Eriogonum fasciculatum* Benth. *Vide* Watson. The same as 729 from San Quentin, of former paper.
706. *Eriogonum Pondii* Greene. Pitt I, 267. Compact plant about a foot high in exposed situations. (No. 85 of Mr. Greene's list.) Collected by Lieutenant Pond, 1889.
710. *Pterostegia drymarioides* Fich & Mey. Grows among bushes and rocks in shade. It seems not to have been collected before on the island.
704. *Harfordia fruticosa* Greene. Parry in Proc. Acad. Davenport, V., 28. This species, before little known, has now been collected in great abundance, both in flower and in fruit. The perianth is six parted and stamens nine in two rows. The flowers seem to be perfect and not dioecious. This is one of the most common shrubs of the island, growing in cañons and exposed places; 3 feet high. Collected by Dr. Veatch. (Mr. Greene's No. 63.) Lieutenant Pond, 1889.
737. *Mirabilis Californica* Gray. Collected by Dr. Streets in 1876. (No. 65 of Mr. Greene.)
754. *Atriplex*. n. sp. Dioecious, perennial and woody at base, 1 to 2 feet long, erect or ascending, glabrous and densely glaucous, becoming a little scurfy in age: leaves small (6 to 12 lines long) broadly ovate to oblong, tapering at base into a short petiole, abruptly acute at apex: bracts small (1½ lines wide by 1 line high) somewhat compressed, cuneate at base, scarcely marginal with a few small teeth above, sometimes a little mucronate on the sides: sterile flowers densely glomerate, five parted. Grows in abundance near the beach. Perhaps nearest *A. dilata*, Greene, but smaller fruit, leaves, etc.
745. *Atriplex microcarpa* Dietrich.
742. *Aphanisma blitoides* Nutt. This plant has been collected this season, also at San Quentin, San Benito Island, Guadalupe Island. Not before found on this island.
756. *Chenopodium murale* Linn. (No. 83 of Mr. Greene.) Only a few specimens collected.

729. *Simmondsia Californica* Nutt. This is *S. fabulosa* of Kellogg, referred here by S. Watson, but without seeing specimens. It is only known from Dr. Veatch's collection and was not rediscovered by Mr. Greene. Dr. Palmer speaks of it as a large shrub at mouth of cañons.
676. *Juncus robustus* Wat.
764. *Juniperus Cerrosianus* Kellogg. "An irregular shrub, 3 to 6 feet high, on various parts of the north end, but of no particular use."
763. *Pinus muricata* Don. This plant grows on the highest peak 1,761 feet altitude.
695. *Ephedra* sp. It may be new. Not common; mouth of cañon.
748. *Notholæna candida* Hook. Grows in deep cañons in shade of rocks. (No. 82 of Mr. Greene.)
749. *Pellæa andromedæfolia* Fee. Common in cañons. (No. 81 of Mr. Greene.)
707. *Cheilanthes Brandegei* Eaton n. sp. ined.
659. *Trisetum barbatum* Steud. Often looks as if sown. Found upon the highest points of the island, on the slopes of shady ravines, and under bushes.
660. *Melica imperfecta* Trin. Found, not abundantly, upon hill-sides and ravines, growing more thriftily near small shrubs and among rocks, as if seeking shade or moisture.
661. *Stipa eminens* Car. Grows in large bunches on the lower part of slopes and ravines. A coarse grass, with the dead grass of last year still clinging to the bunches.
662. *Melica imperfecta* Trin. Found in one place only, in a deep cañon near a spring.
663. *Muhlenbergia debilis* Willd. var. Common at the mouth of cañons in exposed positions.
664. *Festuca tenella* Willd. var. Very abundant; growing in large patches, as if sown, upon the highest point of the island, and sparsely in the shade of plants and bushes.
665. *Festuca tenella* Willd. var.
666. *Agrostis verticillata* Trix. Found one plot 3 feet square on a wet place of what is known as the watering place of the island.

### SAN BENITO ISLAND PLANTS.

Mr. E. L. Greene has very recently published (*Pittonia*, vol. 1, pp. 261-266) a very interesting little paper on the vegetation of the San Benito Islands with a list of the known plants. He has enumerated twenty-four species as belonging to the largest islet. His plants were collected by Lieut. Charles F. Pond at various times from December to February. Dr. Edward Palmer spent but a day (March 25) on West San Benito. His general notes of the island and its vegetation are very similar to Mr. Greene's, and need not be repeated here. He collected seventeen species, all of which are given in Mr. Greene's list. He has, however, collected some of the varieties in considerable abundance. He speaks, also, of two forms of *Agave*, neither in flower or fruit. No specimens were sent in, and nothing is known as to the species. If these should prove two distinct species, of course it will increase the number of species to twenty-six. We have included for convenience in a parenthesis, Mr. Greene's number.

909. *Eschscholtzia ramosa* Greene. Bull. Torr. Club, XIII, 217. This plant was collected in 1876 on these islands by Dr. Streets. (No. 1 of Mr. Greene.)
908. *Frankenia Palmeri* Watson. Abundant, especially on level places; a foot to 18 inches high; flowers white to pink. (No. 4 of Mr. Greene.)

917. *Lavatera venosa* Watson. Proc. Am. Acad., XII, 249. Poor specimens were collected by Dr. Streets in 1875. Not since collected until obtained by Lieutenant Pond. Dr. Palmer says of it: "The plant that leads in numbers all others on the island. Its bright green gives the island rather a fertile look. It is on all the level places in the arroyos and deepest cañons and reaches to the summit. A beautiful plant with white and purple flowers, much darker at night, 1 to 3 feet high. The petals are at first straight, and then turn under as they take on the purple color. A fine plant for cultivation in greenhouses and gardens of warmer latitudes." Dr. Palmer has collected it in great abundance, and has obtained a good supply of seed. (No. 3 of Mr. Greene.)
913. *Hosackia maritima* Nutt. But a few specimens collected. The pods are three to nine seeded. (No. 3 of Mr. Greene.)
922. *Cotyledon linearis* Greene. Pitt., I, 285. Very common plant, in bunches over the lower portion of the island. (No. 10 of Mr. Greene.)
921. *Mammillaria Goodrichii* Scheer.
- Mesembryanthemum crystallinum* L. Dr. Palmer says the "Ice plant" was very plentiful on the island, but sent in no specimens. Mr. Greene has, however, identified the species from this island. (No. 11 of Mr. Greene.)
920. *Hemizonia Streetsii* Gray. Collected quite abundantly. (No. 15 of Mr. Greene.) First collected here by Dr. Streets.
915. *Amblyopappus pusillus* Hook & Arn. (No. 16 of Mr. Greene.)
914. *Perityle Greenei* Rose. Bot. Gaz., xv., 117. (No. 17 of Mr. Greene.)
911. *Krynitzkia ambigua* Gray. Growing on the side of a cañon. The plant is clearly the one collected by Lieutenant Pond, but this, as well as Mr. Greene's type, has four nutlets. We have carefully compared both specimens with a very full set in the Gray Herbarium, and we have not been able to separate them. The nutlets are identical and there are specimens with the same habit. (*Cryptanthe patula* Greene.) (No. 21 of Mr. Greene.)
912. *Krynitzkia maritima* Greene. Only a few specimens were collected, as nearly all the plants were dead. The plants are found from 2 to 8 inches high and much branched. Growing on rocky sides of a cañon. (No. 20 of Mr. Greene.)
916. *Lycium Californicum* Nutt. (No. 19 of Mr. Greene.)
910. *Plantago Patagonica* Jacq. Quite common in sandy ravines. (No. 22 of Mr. Greene.)
919. *Euphorbia Benedicta* Greene. Pitt., I, 263. Very common. (No. 7 of Mr. Greene.)
918. *Atriplex deltata* Greene. Pitt., I, 267. The sterile plant.
907. The same species. The fertile plant. (No. 8 of Mr. Greene.)
906. *Brodiaea capitata* Benth. A very common plant on shady slopes. (No. 24 of Mr. Greene.)

#### GUADALUPE ISLAND PLANTS.

Botanists generally will be delighted to know that Dr. Palmer has again visited Guadalupe Island and brought back a large and interesting collection. Only a week was spent on the island, from March 27 to April 3, 1889, but he succeeded in laying in a good supply of a number of species only known from this island and sparingly represented in our herbaria. Besides these several new species were found. He began his collecting at the south end of the island, where the last three days of March were spent, and the first three days of April were spent at the north end of the island.

It will be remembered that in 1875 Dr. Edward Palmer spent three months (February to May) on this island. This was the first visit ever

made to Guadalupe Island by a botanist. The next year appeared Mr. Watson's admirable paper (Proc. Amer. Acad., vol. XI) on the flora of this island and a list of Dr. Palmer's plants, of which twenty-one were considered new.

Ten years afterward Mr. E. L. Greene spent a week (the last of April) adding to the flora fifteen species, describing seven new species, and publishing in 1885 (Bull. Cal. Acad., vol. 1) his notes, and a catalogue of the flowering plants and ferns of the island.

Mr. Watson separates the phænogamous plants into five groups as follows: (1) Introduced species, twelve; (2) species which range from the Pacific to the Atlantic States, nine; (3) those found in California as far north as San Francisco, forty-nine; (4) those only in southern California, eighteen; (5) those peculiar to the island itself, twenty-one. Add to these an undetermined *Heuchera* and six ferns makes a total of one hundred and sixteen Phænogams and Pteridophyta. Mr. Greene's list enumerates one hundred and thirty species, all except twenty-six he had observed in his short stay upon the island. Probably six of the fifteen added by Mr. Greene belong to the first group. Among the present additions at least four have very recently gained a foot-hold here, viz, *Melilotus Indica*, *Sonchus tenerrimus*, *Suaeda Torreyana*, and *Centaurea Melitensis*, making the total number of introduced species as twenty-two; one is to be added in the second group. In the third group, Mr. Greene's list adds five and ours three, viz, *Tissa macrotheca*, *Tissa pallida*, and *Trisetum barbatum*, making the number of distinctly Californian species fifty-seven.

In the fourth group the two *Cactaceæ* and two *Gramineæ* make the number of southern Californian species twenty-two. Of the fifteen additional species added by Mr. Greene but one he described as new, another probably new. Dr. Palmer has at this time collected seventy-two species, fourteen of which are additions to the flora of the island and four are new. The total number of species now known on the island is one hundred and forty-five. Of the thirty-four species first described from this island but three have since been found elsewhere. The following list so far as known is peculiar to the island:

- |   |  |
|---|--|
| 1. <i>Eschscholtzia Palmeri</i> Rose.     | 16. <i>Perityle incana</i> Gray.           |
| 2. <i>Lavatera occidentalis</i> Wat.      | 17. <i>Baeria Palmeri</i> Gray.            |
| 3. <i>Spharalcea sulphurea</i> Wat.       | 18. <i>Krynitzkia foliosa</i> Greene.      |
| 4. <i>Spharalcea Palmeri</i> Rose.        | 19. <i>Harpagonella Palmeri</i> Gray.      |
| 5. <i>Lupinus nireus</i> Wat.             | 20. <i>Phacelia phyllomanica</i> Gray.     |
| 6. <i>Lupinus Guadalupeensis</i> Greene.  | 21. <i>Phacelia floribunda</i> Greene.     |
| 7. <i>Trifolium Palmeri</i> Wat.          | 22. <i>Convolvulus occidentalis</i> Gray.  |
| 8. <i>Hosackia ornithopus</i> Greene.     | 23. <i>Convolvulus macrostegia</i> Greene. |
| 9. <i>Enanthe Guadalupeensis</i> Wat.     | 24. <i>Hesperelca Palmeri</i> Gray.        |
| 10. <i>Megarrhiza Guadalupeensis</i> Wat. | 25. <i>Atriplex Palmeri</i> Wat.           |
| 11. <i>Galium angulosum</i> Gray.         | 26. <i>Erythraa edulis</i> Wat.            |
| 12. <i>Diplostephium canum</i> Gray.      | 27. <i>Mimulus latifolius</i> Gray.        |
| 13. <i>Hemizonia frutescens</i> Gray.     | 28. <i>Pogogyne tenuifolia</i> Gray.       |
| 14. <i>Hemizonia Greeneana</i> Rose.      | 29. <i>Calamintha Palmeri</i> Gray.        |
| 15. <i>Hemizonia Palmeri</i> Rose.        |  |

After those species collected by Dr. Palmer on his former trip, we have included the number and year in a parenthesis.

- 882. *Eschscholtzia Palmeri*** Rose, n. sp. Small compact plants, from 1 to 2 inches high, annual, very glaucous: leaves compact, finely dissected into linear lobes: flowers large for the size of the plant, petals 5 to 6 lines long, yellow, orange at base: the peduncles (in fruit) 1 to 2 inches long: torus very thick, with no hyaline internal edge: pods  $1\frac{1}{2}$  to  $2\frac{1}{2}$  inches long, thick, straight, or slightly curved: calyptra oval, with short acute tip.  
March 29 or 30. Only seen on a rocky ledge, but there common. On south end of Guadalupe Island.
- 875. *Eschscholtzia ramosa*** Greene. Bull. Torr. Club, xxii, 217. In cañons, but not common on the south end of the island. March 29 and 30. Also at San Benito, March 25, No. 909. Probably No. 3 of Mr. Watson's list. "*E. hypocoides* Var." This is the way Dr. Gray has referred the plant in herbarium specimens.
- 880. *Sisymbrium reflexum*** Nutt. Shady portions of cañons on south end of the island. March 29. (No. 4 of 1875.)
- 854.** The same. Two small plants found on the south end of the island.
- 897. *Lepidium Menziesii*** D. C. South end of the island. March 29. (No. 7 of 1875.)
- 851. *L. lasiocarpum*** Nutt. Only two specimens collected in a cañon at the south end. (No. 8 of 1875.)
- 841.** The same. In a similar locality. This species was not found by Mr. Greene. (No. 8 of 1875.)
- 892. *Oligomeris subulata*** Bois. Grows scattering along the arroyos.
- 845.** The same. Found about the sandy beach at the north end. April 1 to 3. (No. 10 of 1875.)
- 864. *Tissa macrotheca*** Britton. Torr. Bull., vol. xvi, p. 129. Common on exposed sides of hills, in arroyos, and sides of cañon. Not before reported from this island, and extends the range of the species considerably southward.
- 864a. *Tissa pallida*** Greene. Bull. Torr. Club, vol. xvi, 129. Collected with the preceding, but not so common. This species was described in the Torrey Bulletin of 1889 (p. 129); has previously only been found near San Francisco and Monterey (?). We are indebted to Dr. N. L. Britton for the determination of these two species.
- 837. *Silene Gallica*** Linn. Abundant about the beach. (No. 11 of 1875.)
- 846. *Claytonia perfoliata*** Donn. In cañon at north end, where there is much shade and moisture. The flowers are said to be white. (No. 15 of 1875.)
- 844. *Calandrinia Menziesii*** H. B. K., var. *caulescens* Gray. At the north end. (No. 14 of 1875.)
- 869. *Malva borealis*** Wallman. In the former collection, only found from the middle of the island, but now introduced all over the island. (No. 16 of 1875.)
- 897. *Sphæralcea Palmeri*** Rose, n. sp. Stems 12 to 18 inches high, from a thick woody base, angled, covered with a dense, stellate pubescence: leaves broad-ovate, 2 to  $2\frac{1}{2}$  inches long, thick, crenulate-toothed, obtuse: calyx 3 lines long, with broad lobes: petals canary-yellow, with pink varieties: the carpels 2 to  $2\frac{1}{2}$  lines long. The upper margin is rather thick and broad and of different texture. The carpels are narrower and longer than in *S. sulphurea*, two ovules commonly maturing. Found in all exposed parts on the south end of the island. This species seems quite distinct from *S. sulphurea*.
- 861. *Lupinus niveus*** Watson. Annual, 6 to 15 inches high; the ovate cotyledons (6 to 8 lines long) persistent; leaflets oblanceolate, obtuse; pods 1 to  $1\frac{1}{2}$  inches long, two to five seeded; seeds 3 lines in diameter. In flower and fruit, March 29, on the south end of the island. Growing in sandy bed of cañon. (No. 25 of 1875.)

859. *Trifolium Palmeri* Watson. Quite common on the south end in wet sand in cañons. (No. 26 of 1875.)
832. The same. Very common in large masses in cañons and plains at the north end. This plant is widely distributed over the island, and forms the main food supply for the goats.
831. *Trifolium microcephalum* Parsh. A very common plant at the north end in cañons and exposed places. It is much eaten by goats. April 1. (No. 27 of 1875.)
840. *Melilotus Indica* All. Not before reported from the island. Common along the beach, ascending into shady cañons and perhaps introduced with the goats. North end of island. April 1 to 3.
853. *Hosackia ornithopus* Greene. Only one plant found near the mouth of a cañon at the north end. Mr. Greene found it abundant in the middle of the island, 1885. We have not seen Palmer's 1875 plant.
847. *Vicia exigua* Nutt. Common in shady sides of ravines at the north end. Dr. Palmer on his first visit only saw a single small specimen. Mr. Greene says it was not uncommon.
893. *Mentzelia dispersa* Watson. Common among shady rocks in cañons. South end of the island March 29. (No. 32 of 1875.)
850. *Galium aparine* L. At north end. April 1. (No. 35 of 1875.)
900. *Tillæa leptopetala* Benth.
902. *Opuntia prolifera* Engl. Grows on both ends of the island on stony ridges and steep mountain sides. 3 to 5 feet high; not in flower. Collected by Mr. Greene.
- Mesembryanthemum crystallinum* Linn. Dr. Palmer wrote that this grew on the island, but collected no specimens. Mr. Greene also collected it.
901. *Mamillaria Goodridgei* Scheer. With five to six globose heads. At first covered with a white wool but becoming glabrate. Common on south end of island. Not found by Dr. Palmer in 1875, but collected by Mr. Greene in 1885.
899. *Amblyopappus pusillus* H. & A. March 30. (No. 46 of 1875.)
849. *Microseris linearifolia* Gray. A few specimens only collected on the north end of the island. (No. 50 of 1875.)
895. *Filago Arizona* Gray. South end of the island. March 30. (No. 38 of 1875.)
885. *Gnaphalium Sprengelii* H. & A. Only three plants seen, these in the bed of an arroyo. South end. March 29. Collected by Palmer in 1875, but without number.
874. *Hemizonia (Hartmannia) Palmeri* Rose, n. sp. Perennial, with thick woody base, forming small bunches; branches decumbent or ascending, with abundant, white, silky pubescence, not at all viscid: leaves numerous, silky, 9 to 12 lines long, linear to narrowly oblanceolate: heads numerous, somewhat corymbose: involucre 2 lines high: rays eight, three-toothed: the chaff forming a cup about the disk-flowers cleft to the middle, the divisions linear-acuminate: disk flowers about ten, the akenes sterile: pappus of six to twelve, linear-acuminate scales, the ray akenes barely a line long, the rostellum very short, and compressed closely against the top of the akene.
- A peculiar species, and by far the most decided shrub of the genus. In many respects near to the following, but in leaves, pubescence, inflorescence, etc., very different. A very common plant on the south end of the island, in all exposed places Dr. Palmer writes that it is a very attractive plant in that dry latitude. The three species from this island seem to form a peculiar group by themselves.
865. *Hemizonia (Hartmannia) Greeneana* Rose, n. sp. Perennial, forming large round bunches 2 to 3 feet high, with sterile branches hanging down the sides, somewhat pubescent, more or less viscid throughout: leaves crowded, dark



green; those of the sterile branches lanceolate in outline, with a thick margin, 6 to 10 lines long, six to eight pinnately-toothed and parted, sometimes entire; those of the central flowering branches smaller, linear, entire: Heads single, terminating the branches: involucre 3 lines high: rays 8, three-toothed, the chaff forming a cup about the disk flowers, united until maturity, with eight ovate, acute-tipped teeth: disk flowers eight to ten, sterile: pappus of six to ten unequal paleaceous bracts, mostly shorter than the akenes: the ray akenes over a line long, the rostellum a half line long.

A very peculiar species, but seemingly nearest *H. frutescens* of this island. It differs from that species strikingly in manner of growth, in its inflorescence, in its leaves, and in its internal involucre. The akenes are very similar but larger. *H. frutescens* is a very rare species from near the central part of the island. This species is very common on the south end in all the arroyos, cañons, and along the beach. It is a very homely plant, growing in great clumps in barren places, and the most noticeable plant of the region.

- 876. *Bæria Palmeri* Gray.** First collected on this island by Palmer in 1875 and afterwards by Greene. It is very common at bottom of cañons at south end of island. March 29. (No. 45 of 1875.)
- 881. *Franseria camphorata* Greene.** Bull. Cal. Acad., i, 192. Very common on the south end of the island. March 29. (No. 40 of 1875.)
- 891. *Perityle Grayi*.** Rose, Bot. Gaz., xv., 118.
- 849. *Microseris linearifolia* Gray.** At the north end. (No. 50 of 1875.)
- 834. *Senecio Palmeri* Gray.** Dr. Palmer makes the following note with reference to this plant: "Since my previous visit to this island this plant has decreased; spots that contained a thicket of it have now but dead plants, with a few scattering plants alive." Professor Greene speaks of this plant as being quite common. The rapid extermination of this species seems to be a parallel case to that of *Cupressus Guadalupeensis*, spoken of by Mr. Greene. (Proc. Cal. Acad., I, 217.) Fortunately Dr. Palmer has laid in a supply of this species, and all our American herbaria will have good specimens, even if it should become extinct. (No. 45 of 1875.)
- 836. *Centauria Melitensis* Linn.** This weed has become introduced on the north end, and is gradually finding its way up the island. Not reported in the other lists from the island.
- 871. *Sonchus oleraceus* Linn.** Small, slender form, from 2 inches to a foot high; radical and lower cauline leaves mostly undivided. Shady spots in cañons; not very common. At the south end. (No. 52 of 1875.)
- 872.** The same, but somewhat taller, with pinnate leaves, the lobes spinulose-toothed. Also in cañons at the south end, but rarer.
- 873. *Sonchus tenerrimus* Linn.** A very small, slender form 2 to 8 inches high. Growing in shady cañons at the south end. An introduced species. Not before found on the island. Not common.
- 887. *Gilia Nevinii* Gray.** Only a half dozen plants seen on south end of island. When first collected in 1876 it was found very abundant. March 30, 1889. (No. 78 of 1875.)
- 833.** The same. A few plants found at the north end. April 1.
- 889. *Nemophila racemosa* Nutt.** Have seen no specimens of this species. The Guadalupe plants of Palmer, 1875 (No. 76), were referred to *N. aurita*. The linear segments of the leaves are strongly serrate. The flowers minute, apparently smaller than the species. Among rocks, edge of dry arroyo. March 30, south end of island.
- 852.** The same, from the north end, where it is more common, and found among rocks in cañons.

835. *Ellisia chrysanthemifolia* Benth. The stems are prostrate or ascending, divaricate, very pubescent. Leaves mostly opposite, pinnate; the oval lobes toothed; calyx very small, shorter than the capsule. Corolla white, about the size of calyx. Only found in cañon at north end. April 1. (74 and 75 of 1875.)
866. *Phacelia floribunda* Greene. Bull. Cal. Acad., i, 200. In shady cañon at the south end.
- 866a. A small, almost simple form, 3 to 5 inches high, growing with the last.
833. The same, from cañons at the north end. In all these cases the capsule is somewhat oblique, and only a single seed matures.
848. *Emmenanthe penduliflora* Benth. Found in cañons and hill-sides, at both ends of the island. April 1. On the north end.
898. The same, from the south end of island. March 30. (No. 73 of 1875.)
894. *Krynitzkia foliosa* Greene. Certainly very distinct from *K. ambigua*. Only known from this island, but here common, growing with *K. maritima*. First collected by Palmer (No. 68 of 1875) and afterwards by Greene. Found in sandy arroyos and shady cañons. March 29 and 30. South end of the island. No. 877 the same.
842. The same, from a cañon at the north end.
879. *K. maritima* Greene. A small compact form, growing with No. 877 (No. 67 of 1876) on south end of island.
860. *Solanum nigrum* Linn. var. About a foot high, glabrous; leaves dentate, small; flowers small (about two lines in diameter), violet. Only a single plant found growing among rocks in cañon, on south end of island. March 29. (No. 60 of 1875.)
839. *Mimilus latifolius* Gray. (No. 58 of 1875.)
878. *Plantago Patagonica* Jacq. South end of island; common. March 29. (No. 54 of 1875.)
888. *Pterostegia drymarioides* F. & M. (No. 84 of 1875.) At south end. March 30.
843. The same. Found in cañons among shady rocks at north end. April 1.
886. *Mirabilis Californica* Gray. Common. (No. 82 of 1875.) South end of island. March 30.
884. *Parietaria debilis* Foster. Common in shady cañons. (No. 87 of 1875.)
658. *Brodiaea capitata* Benth. In deep ravines and on hill-sides on the south end of the island. Not reported in Mr. Watson's paper, but Dr. Palmer says it is now quite plentiful. Also found by Mr. Greene.
857. *Polypodium Californicum* Kaulf. On the north end. (No. 103 of 1875.)
855. *Notholaena Newberryi* Eaton. (No. 103 of 1875.)
856. *Gymnogramme triangulare* Kauf.
656. *Muhlenbergia debilis* Trin. Found in the shade of rocky ledges and also in the exposed part of a cañon of the southern part of the island.
670. The same; collected at the northern end of the island. Goats do not eat this grass.
657. *Festuca tenella* Willd. Habitat as 656. Saw no indications of the feeding of goats (the only animals here) upon this grass.
674. The same; found the south of the island.
658. *Trisetum barbatum* Steud. Evidently an annual; beyond the frost line it may be perennial. In dry seasons very little seed is formed, as the goats crop this plant closely (there is but scanty vegetation on this, the southern end of the island), but this year rain has been frequent, and this plant is abundant, enabling us to get ripe seed. This may be improved by cultivation, plants found in favorable situations becoming quite large. It also makes good hay.

667. The same; from northern part of island. Very common grass, making the best forage upon this end of the island. In the cañons it is very large, growing so thickly that it looks like grain.
673. The same.
668. *Avena barbata* L. Found some specimens 4 feet high in the cañons and on the rough slopes.
669. *Aristida bromoides* H. B. K. In deep cañons among other grasses and plants.
675. The same.
671. *Hordeum murinum* L. Very abundant, bidding fair to exterminate other grasses and plants.
672. *Festuca Myurus* L. Not common. Grows in bunches in cañons among other grasses.

#### HEAD OF THE GULF OF CALIFORNIA.

Three days were spent at Lerdo, Mexico. This locality is 60 miles south-southwest from Yuma, latitude  $31^{\circ} 46' 10''$ , and longitude  $114^{\circ} 43' 30''$ .

The most interesting thing obtained here was *Ammobroma*, which for the first time has been collected in good quantity.

956. *Nasturtium palustre* D. C.
955. *Achyronichia Cooperi* T. & G. Places in river bottoms. Lerdo, Mexico.
934. *Dalea Emoryi* Gray. In the deserts of southeast California and western Arizona, and south to Los Angeles Bay. One of the two hosts of *Ammobroma*.
941. *Oenothera scapoidea* Nutt. Var. Stems 4 to 8 inches high, much branched at base, lateral leaflets very small, or none; calyx dark red within, petals less than 2 lines long, light yellow. Hemsley does not mention this plant as growing in Mexico in Biol. Cent. Amer.
933. *Franseria dumosa* Gray. Also collected here by Dr. Edward Palmer in 1885. This species is common in the desert regions of south Utah, Arizona, southeast California, and extending as far south as Los Angeles Bay, Lower California. This is one of the two species upon which *Ammobroma Sonoræ* is found, and its wide distribution leads us to expect that other stations of that parasite will yet be found.
957. *Gnaphalium Sprengelii* H. & A. Dry places in river-bottoms.
940. *Palafoxia linearis* Lag. On the dry sand-hills.
- Ammobroma Sonoræ* Torr. This was first discovered in 1854 by Col. A. B. Gray, in charge of a railroad exploring party, at the head of the Gulf of California. At this time a short notice of the discovery was published by Col. A. B. Gray in *Memoirs of the American Academy of Science*, but it was not until 1867 that a description of the genus was published by Dr. John Torrey in the *Annals of Lye. Nat. Hist. N. Y.* Vol. VIII, p. 51, together with a good figure. So far as we can learn the plant was not collected again until Schuchard got it in Arizona. And now Dr. Palmer collected it in large quantities at Lerdo, Mexico. Until the present season its host plant has been unknown but Dr. Palmer has carefully examined into this, and collected two common plants of this arid region upon which it grows. These are *Franseria dumosa* and *Dalea Emoryi*. Dr. Palmer wrote that the plant grows in deep sand, the deeper the sand the larger and juicier the plants. The Cocopa Indians gather them for food, which they relish under all circumstances. They eat it raw, boiled, or roasted. The plant is full of moisture, and whites and Indians alike resort to it in traveling, as a valuable substitute for water. It has a pleasant taste, much resembling the sweet

potato. The stems are  $2\frac{1}{2}$  feet long and 1 to 4 inches in diameter, but almost buried, only the peculiar white tops appearing above the sand. The Cocopa Indians call it "Oyutch." Colonel Gray gave much the same report of this plant. He says the Papago Indians dry the stems and grind them with the mesquit beans, forming what they call "pinole."

937. *Aphyllon Cooperi* Gray. Parasitic on *Franseria dumosa*. The Cocopa Indians also use this plant for food. It is very bitter, but this is mostly removed by boiling. They call it "nep-cha-ga." It grows in the sand.
938. This is the same. Parasitic on *Ephedra*.
953. *Amaranthus Palmeri* Wat. Var. A peculiar caespitose form, forming great mats, some stems with slender ascending or erect stems 4 to 10 inches long. At Lerdo, Sonora, Mexico, April 24 to 26, 1889. Grows in river-bottom, in rather dry places.
958. Probably the sterile of the same. Stems much branched at base and slender, *Sagittaria variabilis* Engl. The bulbs of this plant are much used by the Cocopa Indians either raw or roasted. Lerdo, Sonora.
- Ruppia maritima*, Linn. Lerdo, Sonora. Hemsley says that this species had not been collected in Mexico, although it might be expected.
931. *Scirpus maritimus*, Linn. *vide* F. V. Coville.
- 924-931. *Uniola Palmeri* Vasey. This grass was collected 35 miles south of Lerdo and about 15 miles from the mouth of the Colorado River. It grows abundantly on the tidal lands and forms almost the principal food-plant of the Cocopa Indians. A full account of this plant, with plate, appears in the Garden and Forest for August, 1889.
948. *Panicum colonum* Linn. An annual grass of which the seeds are used for food by the Indians.
947. *Panicum capillare* Linn. var. *miliaceum*, V. A peculiar variety with a drooping panicle, of the habit of *P. miliaceum* but with smaller spikelets. This is also used as food by the Indians, who sow the seeds in the rainy season.
946. *Lolium temulentum* Linn. Introduced.
945. *Diplachne imbricata* Scrib. This extends into Arizona and southern California.