

LIST OF PLANTS COLLECTED BY DR. E. PALMER IN ARIZONA IN 1890.

By J. N. ROSE.

Dr. Palmer, after having made large and valuable collections in Lower California and Mexico in the early months of the year, visited Arizona during the latter part of April, remaining there through May and June and a part of July. He made collections at Camp Huachuca, Willow Springs, and Fort Apache. A small collection made in 1889 at Camp Huachuca which Dr. Palmer purchased is included in this report; these plants are designated by letters only.

Camp Huachuca is about 15 miles from the Mexican border at the base of the Huachuca Mountains, in the extreme southeastern part of Arizona. Its elevation is 5,100 feet above sea level. The mountains are rough and rocky. The soil is of decomposed granite. Dr. Palmer was here from April 26 to May 21, and collected about one hundred species. The season was unfavorable for his work as no rain had fallen for seven months and the mountains and valleys were dry and barren, and the only plants found in proper condition for collecting were in the gardens and in two moist cañons. The plants of this collection are numbered from 416 to 478; unfortunately the numbers 450 to 459 were repeated, hence the latter are designated by the letter *a* in addition.

The only other important collection¹ made at this place is that of Mr. J. G. Lemmon and wife in 1882, a very large and valuable one, of which over fifty species were new.

Willow Springs is in the White Mountains near the pass leading to Fort Apache, at an altitude² of 7,600 feet. It is 75 miles south of Holbrook on the Atlantic and Pacific Railroad and is reached only by stage. The mountains here are covered with oaks and pines, and the two large meadows from which this collection was largely made, kept damp by the springs, were covered with vegetation. Dr. Palmer remained here from June 10 to 25; the nights at this season are very cool, often thin ice is

¹ Mr. Lemmon writes me that Dr. Palmer visited this place once before; as it was during the dry season nothing of importance was obtained.

² Dr. Rothrock gives the altitude of the pass 7,400 feet and of Willow Springs 7,195. Wheeler's Report, vi. 22.

formed. At this time he collected the plants numbered 479 to 574; on his return from Fort Apache he remained two days, July 5 and 6, collecting numbers 613 to 626.

Dr. Rothrock, in Wheeler's Report, vol. vi., has forty eight species from this place; most of these were recollected.

Fort Apache, upon the east fork of Salt River, in the Indian reservation of the valley of the White Mountains, has an altitude of 5,200 feet.¹ It is only reached after one hundred miles of rough mountain staging. The mountain here also is covered with oaks and pines, but the valley is dry, having little or no vegetation. Salt River supplies water for the fort and for irrigating the gardens and the farms of the Indians. The temperature is 10° warmer than at Willow Springs. Dr. Palmer was at Fort Apache from June 21 to 30, collecting plants numbered 575 to 613.

Dr. J. J. Rothrock made a small collection here in 1874. (Wheeler's Report, vi.)

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- Clematis Palmeri**, n. sp. A peculiar form which we have not been able to place. It seems nearest *C. filifera* Benth. of Mexico. The leaves very thin and delicately nerved, pinnate-ternate; the leaflets obtusely 3-lobed, paler beneath: peduncles one-flowered, 6 to 7 inches long: akenes with long plumose tails.—Among bushes along river bottom. Fort Apache, June 21 to 30. No. 600.
- Thalictrum Fendleri** Engelm. Under bushes in a ravine near Willow Springs. June 10 to 20. No. 516.
- Ranunculus affinis** R. Br., var. *cardiophyllus* Gray, Proc. Phil. Acad. 1863, p. 56. Common in swampy meadows. Collected here by Rothrock also. This form was first published by Dr. Gray, under the above varietal name, followed by Rothrock, Watson, and others, but in his last revision he takes up a new name, var. *validus*. Willow Springs, June 10 to 20. No. 498.
- Ranunculus macranthus** Scheele. Very common in wet bottoms. Rothrock also collected it here. Willow Springs. June 10 to 20. No. 495.
- Ranunculus hydrocharoides** Gray. Common, in a marsh. This species was also collected here by Rothrock. Willow Springs. June 10 to 20. No. 485.
- Aquilegia chrysantha** Gray. Very common in the cañons along water courses. Fort Huachuca. April and May. No. 434.
- Erysimum Wheeleri** Rothrock. Only in flower, but apparently this species. Willow Springs. June 10 to 20. No. 483.
- Capsella Bursa-pastoris** Moench. Collected in a garden at Fort Huachuca. April and May. No. 444.
- Ionidium polygalæfolium** Vent. Collected in an old garden at the mouth of a cañon. Fort Huachuca. April and May. No. 445.
- Cerastium nutans** Raf. In swamps at Willow Springs. June 10 to 20. No. 515.
- Claytonia Chamissonis** Esch. Willow Springs. June 10 to 20. No. 570.
- Sphæralcea Fendleri** Gray. A peculiar form with very small flowers and carpels. Grows on open mesas at Fort Apache. June 21 to 30. No. 594.
- Linum perenne** L. Willow Springs. June 10 to 20. No. 529.
- Linum aristatum** Engelm. *fide* Trelease. Collected at the edge of rich bottoms and slopes under oaks and pines. Willow Springs. June 10 to 20. No. 497.
- Ptelea trifoliata** L. A loose growing shrub about 8 feet high. Fort Huachuca. April and May. No. 428.
- Rhamnus Californica** Esch., *fide* Trelease. Fort Huachuca. April 26 to May 21. No. 431. Willow Springs. June 10 to 20. No. 520.

¹ Only 5,000 feet. Wheeler's Report, vi. 23.

Ceanothus integerrimus Hook. and Arn. Fort Huachuca. April and May. No. 427. "The leaves are somewhat thicker, more like *C. spinosus*," Mrs. K. Brandegee. Found at the head of a deep cañon among undershrubs. April and May. No. 427.

Ceanothus Fendleri Gray, *vide* Mrs. K. Brandegee. Very common. Willow Springs. June 10 to 20. No. 501.

Ceanothus buxifolius Willd, *vide* Mrs. K. Brandegee. Fort Huachuca. April and May. No. 451.

Vitis Arizonica Engelm. A very common grape and bears abundant fruit: when growing in shade of trees and bushes it climbs over them, but when growing in exposed places alone it becomes bush-like with merely the slightest inclination to climb, and has the appearance of a California cultivated grape which has been closely pruned to the height of 3 to 4 feet. Fort Apache. June 21 to 30. No. 609. Also very common in all the cañons at Huachuca. April 20 to May 21. No. 446.

Rhus glabra L. Only a few plants seen at Fort Apache. June 21 to 30. No. 585.

Rhus Toxicodendron L. Very common. Fort Huachuca. April to May. No. 453a.

Rhus aromatica Ait., var. *trilobata* Gray. Called "Squaw berry," and is gathered in great quantities by the Indians. The slender twigs are used by them in making baskets. Fort Apache. June 21 to 30. No. 590.

Thermopsis montana Nutt. Willow Springs. June 10 to 20. No. 528.

Lupinus Palmeri Watson. Very common under pines and on high level places. Willow Springs. June 10 to 20. No. 533.

Trifolium involucratum Willd. Common in marshes along creeks. Also collected here by Rothrock (No. 229). Willow Springs. June 10 to 20. No. 507.

Hosackia Wrightii Gray. Willow Springs. June 10 to 20. No. 525.

Hosackia puberula Benth. Collected at the edge of a garden at Fort Huachuca. April and May. No. 422.

Psoralea tenuiflora Pursh. Willow Springs. June 10 to 20. No. 512. Also collected near Fort Huachuca in 1889.

Amorpha fruticosa L. A shrub 4 to 6 feet high, with many stems. "Bloom navy-blue with amber-colored anthers." Common along creeks. Also collected here by Rothrock (No. 244). Willow Springs. June 10 to 20. No. 484.

Dalea formosa Torr. A small bush, 1 to 1½ feet high. Fort Apache. June 21 to 30. No. 584.

Dalea aurea Nutt. Grows on stony mesas among bushes. Fort Apache. June 21 to 30. No. 611.

Petalostemon candidus Michx. Grows in large masses along river bottoms. Collected by Rothrock (No. 248) at Willow Springs. Fort Apache. June 21 to 30. No. 595.

Astragalus Bigelovii Gray. Collected near Fort Huachuca, 1889. Letter M.

Astragalus Arizonicus Gray. Collected on the parade ground at Fort Huachuca. April and May. No. 424.

Vicia leucophæa Greene. Bot. Gaz. vi. 217. About 2 feet high, hanging over small plants. Leaflets 2 to 6, mostly 4. Flowers "lemon-colored with violet spot." Style densely hairy in the middle. Very near to this species is *V. medicincta* Watson, and should be referred as var. *medicincta* of the above species. It differs only in its more narrow leaflets and stipules.

In the type (Palmer's specimen) the stipules are described as linear, the flowers solitary on pedicels (peduncles), 3 to 6 lines long. In the only other collection of this form (Pringle's, 1887) I find some of the stipules almost subhastate, and some of the peduncles an inch or more long, with 2 flowers. I should state here that I have not yet seen any specimens of this form with 6 leaflets.

A slight change is necessary in Mr. Greene's description of the style, which he

says is "very villous at the apex," while Lemmon's plant, seemingly a part of the type, has the style hairy as above. The species has only been reported from southwestern New Mexico and southeastern Arizona, while this variety is from New Mexico. Palmer's specimens were collected at Willow Springs July 5 and 6. No. 625.

Vicia pulchella H. B. K. Flowers white. Also collected here by Rothrock under various numbers. Willow Springs. July 5 and 6. No. 621.

Vicia Americana Muhl. Collected here also by Rothrock (No. 224 in part). Willow Springs. June 10 to 20. No. 530.

Lathyrus paluster L., var. *angustifolius* Gray. Grows sparsely on rich bottoms under pines. "Bloom white, upper part pink." Also collected by Rothrock (No. 224). Willow Springs. June 10 to 20. No. 534.

Robinia Neo-Mexicana Gray. A thorny bush or tree 8 to 12 feet high: a loose grower; "bloom rose color," drying purplish. Collected here by Lemmon in 1882. Very common in cañons about Fort Huachuca. April and May. No. 440.

Desmanthus Jamesii T. & G. Bloom lemon color with yellow anthers. Common on gravelly bottoms. Fort Apache. June 21 to 30. No. 606.

Desmanthus depressus H. & B. Flowers "at first canary color, by age becoming salmon color." No fruit obtained. Very common in rich bottoms. Fort Apache. June 21 to 30. No. 613.

Mimosa biuncifera Benth. A loose thorny bush 1 to 1½ feet high: "flowers white," but in Rothrock's report said to be purplish. Also collected by Lemmon at this station. Very common on the plain at the foot of the mountain at Fort Huachuca. April and May. No. 449.

Prunus salicifolia H. B. K., var. *acutifolia* Watson. Proc. Amer. Acad. xxii. 411. Ten to fifteen feet in height, 5 inches in diameter, with edible fruit. Fort Huachuca, April and May. No. 450a.

Fragaria vesca L. Grows among bushes on sloping rich bottoms at Willow Springs. June 10 to 20. No. 487.

Geum triflorum Pursh. Willow Springs. June 10 to 20. No. 506.

Potentilla Hippiana Lehm. Very common in rich moist bottoms. Willow Springs. June 10 to 20. No. 482.

Rosa Fendleri Crepin. This species was also collected at this station by Rothrock. What seems to be the same species from Fort Huachuca was collected from a garden, but the plant originally grew in a neighboring cañon. No. 435. Willow Springs. June 10 to 20. No. 505.

Amelanchier alnifolia Nutt. About 4 feet high. It was found in ravines, high up the mountains. Willow Springs. June 10 to 20. No. 504.

Heuchera rubescens Torr. Collected near Fort Huachuca 1889. Letter K.

Oenothera albicaulis Nutt. Collected at the outer edge of a garden near Fort Huachuca. April and May. No. 471.

Oenothera serrulata Nutt. Willow Springs. June 10 to 20. No. 481.

Oenothera Hartwegi Benth. Common on rich bottoms. Fort Apache. June 21 to 30. No. 582.

Oenothera triloba Nutt. "Flowers yellow." Grows in marshy meadows. This same form was collected at this station by Rothrock. Willow Springs. June 10 to 20. No. 568.

Gaura suffulta Engelm. Found in level places exposed and in the shade. Flowers white but soon change. Willow Springs. June 10 to 20. No. 508.

Gaura coccinea Nutt. Flowers at first white, then rose and sometimes crimson. Fort Huachuca. April and May. No. 417.

Gaura sp. Seemingly near *G. Nealleyi* Coulter. The lower part of stem and leaves glabrous (except a few stiff hairs), above puberulent. Not in fruit and but a single plant seen. Flowers white, changes to red. On hillside. Fort Huachuca. April. No. 420.

- Cereus cespitosus** Engelm. The flowers are a bright red. Common on stony ridges and mountain sides. Fort Huachuca. April and May. No. 475.
- Cereus** sp. Not very common. A very free bloomer with bright showy scarlet flowers. Fort Huachuca. April and May. No. 429.
- Cereus pectinatus** Engelm. (?) A single fruiting specimen obtained. Fort Huachuca. April and May. No. 447.
- Opuntia Engelmanni** Salm. Flowers yellow. Fort Huachuca. April and May. No. 477.
- Opuntia hystricina** Engelm. and Bigel. "It grows about a foot high with several joints." Flowers yellow, lower third red. On stony ridges. Fort Huachuca. April and May. No. 474.
- Opuntia arborescens** Engelm. This cactus is 2 to 3 feet high with flowers of a beautiful crimson. On stony plains and hillsides at Fort Huachuca. April and May. No. 476.
- Pseudocymopterus montanus** var. *tenuifolia* Coult. & Rose. Rev. p. 75. (*Thaspium* (?) *montanum* var. *tenuifolium* Gray.) Common at Willow Springs. June 10 to 20. No. 500. Also collected here by Rothrock.
- Cornus stolonifera** Michx. *vide* Coulter & Evans. A shrub 4 feet high. Willow Springs. June 10 to 20. No. 518.
- Lonicera ciliosa** Poir. About 2 feet high with drooping habit. Found in ravines high up the mountain side. Willow Springs. June 10 to 20. No. 537.
- Sambucus glauca** Nutt. Also collected by Rothrock. Willow Springs. June 10 to 20. No. 292.
- Symphoricarpos oreophilus** Gray. Willow Springs. June 10 to 20. No. 521.
- Galium trifidum** L. Grows along creeks. Willow Springs. June 10 to 20. No. 514.
- Houstonia Wrightii** Gray. Grows in low places and on hillsides. "Flower white with pink tip and corolla." Willow Springs. June 10 to 20. No. 528.
- Bouvardia triphylla** Salisb. The corolla very slender. Collected near Fort Huachuca in 1889. Letter G.
- Valeriana sylvatica** Banks. Willow Springs. June 10 to 20. No. 526.
- Valeriana edulis** Nutt. A common plant. Willow Springs. July 5 and 6. No. 618.
- Stevia Plummeræ** Gray. Collected in a cañon near Fort Huachuca, Arizona. 1889. Letter A.
- To the stations given in Syn. Flora we here add the following, viz: Mogollon Mountains, New Mexico, Rusby (1881), No. 1524; Mexico, Pringle (1887), No. 1260.
- Stevia serrata** Cav. Collected in a cañon near Fort Huachuca, 1889. Letter B.
- Eupatorium occidentale** Hook., var. *arizonicum* Gray. A single specimen from near Fort Huachuca, Arizona. 1889. Letter D.
- Carphochaete Bigelovii** Gray. A single specimen from a cañon near Fort Huachuca, Arizona. 1889. Letter C. Pringle is the only collector who got the plant from Arizona, according to Syn. Flora. We have specimens from Rusby, 1881, collected at the San Francisco Mountains.
- Aplopappus spinulosus** DC. Collected in a cañon near Fort Huachuca, Arizona. 1889. Letter F.
- Solidago Missouriensis** Nutt. Var. Not very common, along river bottoms. Fort Apache. June 21. No. 602.
- Aster ericæfolius** Rothrock. Common on mesas and hillsides at Fort Huachuca. April 26 to May 21.
- Erigeron divergens** T. & G. The stems lie close to the ground. Upper end of a cañon under bushes. Near Fort Huachuca, Arizona. April 26 to May 21. Nos. 450, 494.
- Erigeron flagellaris** Gray. Willow Springs. June 10 to 20. No. 503.
- Baccharis Wrightii** Gray. Grown on second bottoms of Salt River. June 21 to 30. No. 530.

- Baccharis pteronioides** DC. Small shrub 3 feet high on stony mesas. Fort Huachuca, Arizona. April 26 to May 21. The female plant is No. 468. The male plant is a compact shrub 2 to 3 feet high on rocky sides of cañons. No. 443.
- Zinnia grandiflora** Nutt. Fort Apache. June 21 to 30. No. 583.
- Rudbeckia laciniata** L. Willow Springs. July 5 and 6. No. 620.
- Lepachys columnaris** T. & G. Fort Apache. June 21 to 30. No. 601.
- Wyethia Arizonica** Gray. The large roots yield a peculiar odor. Grows in rich bottoms under pines; rather common. Willow Springs. June 10 to 20. No. 543.
- Vigulera cordifolia** Gray. Grows in shade along river bottoms at Fort Apache. June 21 to 30. No. 593.
- Thelesperma gracile** Gray. Very common. Fort Apache. June 21 to 30. No. 396.
- Hymenopappus filifolius** Hook. Grows on rich bottoms. Fort Apache. June 21 to 30. No. 599.
- Hymenopappus Mexicanus** Gray. Found on sandy river bottoms. Willow Springs. June 10 to 20. No. 517.
- Hymenopappus radiata**, n. sp. Perennial from a long slender root, 1½ feet high, branching at base floccose-tomentose becoming somewhat glabrate above: leaves mostly radical, 1 to 2 pinnate into narrow linear segments: heads corymbose on peduncles 1 to 2 inches long: involucre bracts broad, little or not at all petaloid: rays about 5, white, 6 to 7 lines long: disk-flowers numerous; proper tube short, about ½ line long; throat swollen, campanulate, about 1 line long; lobes short, acute, about one-third the length of throat; anthers but not the filaments exerted: akenes 1½ to 2 lines long, obpyramidal, 4-angled with a delicate intermediate nerve, glabrous or a little puberulent: pappus of numerous very short paleæ.—Common in low rich bottoms under pines and oaks. Willow Springs. July 5 and 6. No. 615.
- This species differs from all other species of *Hymenopappus* in the presence of ray-flowers, but in other respects corresponds with this genus. Its habit is perhaps more like *H. filifolius*, but the akenes and pappus are more like *H. flavescens*. Although it seems undoubtedly a *Hymenopappus*, yet in all its external appearances, including the rays, it resembles *Leucampyx*; the disk-flowers, akenes, and pappus are also similar. It has been a puzzle to me to separate this species clearly from *L. Newberryi*, and it is questionable whether they ought not to go together and be placed under *Hymenopappus*. The following are the slight differences I note between the two: In *H. radiata* the pappus is not so deciduous, the proper corolla tube is shorter, and the style-branches a little thicker and not so papillose. The absence of the bracts on the receptacle seems to be the only reliable character separating the two genera.
- Actinella Bigelovii** Gray. This species has been collected in Arizona by quite a number of collectors, but is only credited to New Mexico in Syn. Flora. Grows on stony ridge and slope under pines. Willow Springs. June 10 to 20. No. 486.
- Gaillardia pinnatifida** Torr. The entire-leaved form; a free bloomer. Collected in a garden, in good soil by a water ditch. Fort Huachuca, Arizona. April 26 to May 21. No. 430.
- Pectis longipes** Gray. Common on mesas and hillsides near Fort Huachuca, Arizona. April 26 to May 21. No. 425.
- Achillea Millefolium** L. Willow Springs. June 10 to 20. No. 524.
- Senecio Actinella** Greene. According to Syn. Flora only collected by Rusby at Flag Staff, but it was obtained at the original station by J. G. Lemmon and wife in 1884, and now collected and reported by Dr. Palmer as very common at Willow Springs. June 10 to 20. No. 488.
- Senecio aureus** L. form. Fort Huachuca, April 26. No. 438.
- Senecio Neo-Mexicana** *fide* S. Watson. Willow Springs. June 10 to 20. No. 480.
- Senecio lugens** Richards. A very common plant under pines at Willow Springs. June 10 to 20. No. 479.

- Senecio Douglasii** DC. Very common. Fort Huachuca, Arizona. April 26 to May 21.
- Cacalia decomposita** Gray. In a cañon near Fort Huachuca. 1889. Letter E. The plant is in Pringle's 1886 collection, from Chihuahua, Mexico.
- Cnicus ochrocentrus** Gray. The roots are boiled and eaten by the Apache Indians. A common plant on bottoms and hillsides. Fort Apache. June 21 to 30. No. 605.
- Rafinesquia Neo-Mexicana** Gray. The flowers are pinkish-white when first open. Collected from the parade ground at Fort Huachuca, Arizona. April 26 to May 21. No. 456.
- Krigia amplexicaulis** Nutt. Common in wet bottoms along creeks. Willow Springs. June 10 to 20. No. 539.
- Hieracium Fendleri** Schultz Bip. var. **discolor** Gray. Common on bottoms and mountain slopes. Willow Springs. June 10 to 20. No. 532.
- Malacothrix Fendleri** Gray. Collected on the parade ground at Huachuca, April 26. No. 421.
- Troximon aurantiacum** Hook, var. **purpureum** Gray. The flowers are yellow becoming purplish in drying. The specimens correspond exactly with Fendler's original specimens. Collected in rich bottoms at Willow Springs. June 10 to 20. No. 541.
- Pyrhopappus multicaulis** DC. Grows in low sandy places near river banks. Willow Springs. June 10 to 20. No. 519.
- Lactuca graminifolia** Michx. Willow Springs. June 10 to 20. No. 510.
- Anisacanthus Thurberi** Gray. An upright growing bush about 5 feet high. Beside the collection mentioned in Syn. Flora, we have the species from Pringle, Parish, and Smart. Fort Huachuca, Arizona. April and May. No. 453.
- Arctostaphylos pungens** H. B. K. Fort Huachuca. April and May. No. 458^a (?).
- Arbutus Xalepensis** H. B. K. var. **Arizonica** Gray. A large shrub or small tree 10 to 15 feet high, largest stem 6 inches in diameter. Fort Huachuca. April and May. No. 433.
- Samolus Valerandi** L. var. **Americanus** Gray. Grows in boggy soil near Fort Huachuca. May. No. 470.
- Dodecatheon**, sp. Leaves oblanceolate, 2 to 3 inches long: scape about a foot high, 4 to 5-flowered: flowers 4-parted: "corolla light crimson with purple tinge, the base of petals with white spot and a yellow ring below all:" stamens, 3 lines long, distinct, sessile: capsule obtusish, about the length of calyx. Grows in swamps. Willow Springs. June 10 to 20. No. 342.
- According to Dr. Gray's Revision in Botanical Gazette this form would go into his second section which contains only *D. frigidum*, as the stamens are distinct and almost sessile, but it can hardly be his variety *dentatum* as the leaves are of a different shape, entire, and flowers purple. It resembles in habit the Rocky Mountain variety *alpina* which has been variously referred. But it is not the variety *alpina* recently described by Mr. Greene, Pitt. ii. 12, as *D. pauciflora* as this has a staminal tube nearly as long as the anthers. In the recent arrangement of Mrs. Brandegee, Zoe i. 20, this would answer best in her variety *Jeffreyi*, but as it is here defined, I do not think it includes all the forms placed under it by Dr. Gray. It most resembles a specimen of Cusick's collected in 1884 and distributed as *D. Media*.
- Forestiera Neo-Mexicana** Gray. A stiff growing shrub 4 to 5 feet high in cañons at Fort Apache. June 21 to 30. Nos. 578 and 612.
- Fraxinus pistaciæfolia** Torr. A small tree 6 to 10 feet high. In cañons at Fort Apache. June 20 to 30. No. 592.
- Frasera speciosa** Dougl. This plant grows 4 to 5 feet high. Willow Springs. June 10 to 20. No. 573.

- Gilia aurea** Nutt. Willow Springs. June 10 to 20. No. 496.
- Krynitzkia Jamesii** Gray. Fort Apache. June 21 to 30. No. 591.
- Lithospermum multiflorum** Torr. Common under trees. Willow Springs. June 20 to 30. No. 536.
- Lithospermum Cobrense** Greene. Collected near a ditch in a garden, at Fort Huachuca. April and May. No. 432.
- Onosmodium Thurberi** Gray. Willow Springs. July 5 and 6. No. 617.
- Mertensia paniculata** Don. Willow Springs. July 5 and 6. No. 619.
- Apocynum cannabinum** L. Willow Springs. June 10 to 20. No. 511.
- Asclepias tuberosa** L. In cañons about Fort Huachuca. May. No. 473. Also very common at Willow Springs. June 10 to 20. No. 538.
- Asclepias speciosa** Torr. This species grows along ravines and rich bottoms. Willow Springs. June 10 to 20. No. 544.
- Asclepiodora decumbens** Gray. On mesas and hill slopes about Fort Huachuca. April and May. No. 437.
- Asclepias involucrata** Engelm. On gravelly mesas. Fort Huachuca. April 26 to May 21. No. 454.
- Acerates auriculata** Engelm. This plant grows on river banks in shade of bushes. "Flowers old-gold." Fort Apache. June 21 to 30. No. 604.
- Solanum umbelliferum** Eschs. Along stony ridges. Fort Apache. June 21 to 30. No. 607.
- Nicotiana attenuata** Torr. "Flowers light-violet with white tinge at summit." Dr. Palmer says, "this is the tobacco once commonly smoked by the Apache Indians but is now only used by the very old men, the younger generation preferring that which is sold in the stores." Fort Apache. June 21 to 30. No. 610.
- Evolvulus lætus** Gray. Gravelly mesas and hillsides. Fort Huachuca. April and May. No. 442.
- Veronica Americana** Schwein. Willow Springs. June 10 to 20. No. 540.
- Castilleja parviflora** Bong. Willow Springs. June 10 to 20. No. 513.
- Veronica peregrina** L. Flowers white. Very common. Willow Springs. June 10 to 20. No. 489.
- Pedicularis Parryi** Gray. This plant differs somewhat from the Colorado forms; the floral bracts are callous-denticulate, the beak shorter and thicker. The flowers are lemon-colored. Very common in grassy swamps at Willow Springs. July 5 and 6. No. 622.
- Mimulus luteus** L. Willow Springs. June 10 to 20. No. 527.
- Mimulus**, sp. Perhaps a form of *M. cardinalis*, but with slender calyx tube with ovate-acuminate lobes; corolla salmon-red, 2 inches long, very slender. Common in cañons. Fort Huachuca. April and May. No. 441.
- Chilopsis saligna** Don. Dwarf trees resembling willows in habit; grow in stony ravines, coming from the mountains. Fort Huachuca. April and May. No. 448.
- Erythræa Douglasii** Gray. Near Fort Huachuca. 1889. Letter I.
- Calophanes decumbens** Gray. Collected on the parade ground at Fort Huachuca. April 26 to May 21. No. 472.
- Jatropha macrorhiza** Benth. Plant. Hart. p. 8. A small plant growing on stony mesas and ridges. It has a large root 8 to 9 inches long and 4 to 5 inches in diameter. Fort Huachuca. April and May. No. 469.
- Pentstemon barbatus** Nutt. var. **Torreyi** Gray. "Corolla scarlet, inside of tube orange." A very showy and abundant plant under trees and bushes. Fort Apache. June 21 to 30. No. 588.
- Pentstemon spectabilis** Thurber. "Corolla showy, magenta color. Fort Apache. June 21 to 30.
- Pentstemon linarioides** Gray. Only a few plants seen. Fort Apache. June 21 to 30. No. 585.

- Pentstemon virgatus**¹ Gray. "Corolla white with yellowish cast and a patch of purple on the upper part." Not common; in sandy places. Willow Springs. June 10 to 20. No. 493.
- Pentstemon Wrightii** Hook.† "Corolla beneath light-snuff color, the remainder violet." Grew on level places under pines and oaks. Willow Springs. July 5 and 6. No. 614.
- Verbena ciliata** Benth. Collected near Fort Huachuca, 1889.
- Dracocephalum parviflorum** Nutt. Grows in rich moist bottoms. Willow Springs. June 10 to 20. No. 569.
- Monarda fistulosa** L., var. *media* Gray. Fort Apache. June 21 to 30. No. 579.
- Monarda fistulosa** L. Grows in profusion on grassy slopes and open level places. Willow Springs. July 5 and 6. No. 626.
- Amarantus retroflexus** L. Called "red-root." The White Mountain Apaches use the plant very much as food; the green herbage is cooked and the seeds gathered, parched and ground into flour, from which they make bread, mush, etc. Fort Apache. June 21 to 30. No. 587.
- Chenopodium album** L. Common. Used by the White Mountain Indians as a pot-herb. Fort Apache. June 21 to 30. No. 587.
- Polygonum Bistorta** L., var. *oblongifolium* Meisn. *vide*, S. Coulter. Willow Springs. June 10 to 20. No. 522.
- Eriogonum alatum** Torr. With more corymbose inflorescence than the type. Common on hillsides and river bottoms. Fort Apache. June 21 to 30. No. 597.
- Comandra pallida** A. DC. Willow Springs. June 10 to 20. No. 502.
- Euphorbia montana** Engelm. A very common plant along cañons. Fort Huachuca. April and May. No. 455.
- Acalypha Lindheimeri** Muell. Collected in an old garden. Fort Huachuca. April and May. No. 419.
- Argythamnia mercurialina** Muell. This plant is very common on dry and exposed places. Fort Apache. June 21 to 30. No. 581.
- Tragia urticæfolia** Michx. Willow Springs. June 10 to 20. No. 491.
- Guilleminea densa** Moq. Common in cañons. Fort Huachuca. April and May. No. 457.
- Gomphrena cæspitosa** Torr. Fort Huachuca. April and May. No. 423.
- Juglans rupestris** Engelm. Seen only in cañons. The young trees are quite ornamental. They grow here to a height of 30 feet, and are 1½ to 2½ feet in diameter. No. 416.
- Alnus incana** Willd., var. A large brushy topped tree 20 to 30 feet high and 12 to 18 inches in diameter. The Indians use the bark in tanning. Fort Apache. June 20 to 30. No. 602.
- Quercus Emoryi** Torr. The acorns of this oak are gathered in great quantities by the Mexicans and Indians. A small tree 30 feet high and 1½ feet in diameter. Fort Huachuca. April 26 to May 21. No. 459a.
- Salix nigra** Marsh., var. *venulosa* Anders, *vide* M. S. Bebb. "This varietal name is retained for forms which the species assumes in its distribution from Texas westward. Notwithstanding the inaccuracies of Anderson's description, these originated quite naturally from certain peculiarities in Wright's No. 1877, which peculiarities are now recognized as having resulted from an abnormal growth." M. S. Bebb.
- Iris Missouriensis** Nutt. Very common at Willow Springs. June 10 to 20. No. 499.
- Sisyrinchium anceps** L. Willow Springs. June 10 to 20. No. 490.
- Sisyrinchium angustifolium** Mill. Same habitat as the last. No. 490 a.
- Allium Nuttallii** Watson. Flowers white. The bulbs are eaten by the Indians and "settlers." Willow Springs. June 10 to 20. No. 574.

¹The specimens have on them an *Æcidium*, which Mr. J. W. Anderson tells me is a new species *Æ. Palmeri*.

- Lilium Parryi** Watson. A free bloomer with sweet-scented canary-colored flowers. Grows in the cañons about Fort Huachuca. Pringle also got it near this station in 1884, and beside the type we have specimens from California collected by Parish. April and May. No. 478.
- Smilacina¹ amplexicaulis** Nutt. Willow Springs. June 10 to 20. No. 572.
- Lemna trisulca** L. Common in creeks at Willow Springs. June 10 to 20. No. 531.
- Juncus² xiphioides** Meyer, var. **montanus** Engelm. The specimens have only unopened flowers, but they undoubtedly belong here. No. 571.
- Juncus tenuis** Willd. Flowers not yet opened. This is the typical form with flowers not secund and with the lowest involucral leaf much exceeding the panicle. No. 550.
- Juncus Balticus** Dethard, var. **montanus** Engelm. Flowers just beginning to open. No. 555.
- Juncus longistylis** Torr. Flowers just beginning to open. No. 556.
- Juncus longistylis** Torr. Fruit not yet mature. No. 624.
- Juncus tenuis** Willd. No. 461f.
- Juncus xiphioides** Meyer, var. **montanus** Engelm. No. 467a.
- Eleocharis palustris** R. & S., var. **glaucescens** Gray. The specimens are without fruit, but appear to be a 3-styled form of this plant. No. 554.
- Eleocharis palustris** R. & S. The achenes are not yet mature, and the spikes in their young state are less sharply acute than is usual. No. 155.
- Eleocharis montana** R. & S. Plant only in flower and the determination made only on its general resemblance to the species. No. 459.
- Scirpus pungens** Vahl. No. 460.
- Carex³ hystericina** Muhl., var. **angustior** Bailey, n. var. Whole plant whitish-green, tall and slender but erect; spikes one-half narrower than in the species, erect or ascending; perigynium less inflated, ascending.—Willow Springs, Arizona. No. 464. Pringle's 222 from Santa Rita Mountains is the same.
- Carex teretiuscula** Gooden. No. 553.
- Carex marcida** Boott. No. 552t. No. 552b is a single immature specimen. Mixed with this is *Carex filiformis* L., var. *latifolia* Boeckl.
- Carex filiformis** L. var. *latifolia* Boeckl. No. 549.
- Carex echinata** Murr. No. 548.
- Carex Nebraskensis** Dew., var. *prævia* Bailey. No. 547.
- Carex nudata** W. Boott. No. 546.
- Carex aurea** Nutt., var. *celsa* Bailey. Perigynia distinctly beaked. No. 545.
- Carex occidentalis** Bailey. No. 467.
- Carex teretiuscula**, Gooden., var. *ampla* Bailey. No. 462.
- Carex hystericina**, form. No. 464.
- Eatonia obtusata** Gray. Var. *robusta* Vasey. No. 466.
- Eatonia Pennsylvanica** Gray, var. *longiflora* Vasey. No. 467.
- Eatonia⁴ Pennsylvanica** Gray, var. *major* Gray. 517.
- Eatonia Pennsylvanica** var. Fort Apache June 10 to 20. No. 577.
- Aristida purpurea** Nutt. Fort Apache June 21 to 30. No. 575.
- Stipa leucotricha** Trin. Fort Apache June 21 to 30. No. 576.
- Calamagrostis neglecta** Kunth. A common grass in wet soil. Willow Springs. July 5, 6. No. 616.
- Koeleria cristata** Pers. No. 562.
- Koeleria cristata** Pers, var. Willow Springs. No. 564.

¹ It is proper to state here that Mr. E. L. Greene, in a recent paper (Bull. Torr. Club, xv. 285 to 287), has replaced this genus by the older name *Uniflorum*, which makes this species *U. amplexicaule* Greene.

² The Juncaceæ and Cyperaceæ (except *Carex*) were determined by Mr. F. V. Coville.

³ The CARICES were determined by Prof. L. H. Bailey.

⁴ The Gramineæ were determined by Dr. Geo. Vasey.

- Deschampsia caespitosa** Beauv. Willow Springs. Nos. 566 and 559.
Hierochloa borealis R. and S. Willow Springs. No. 558.
Glyceria nervata Trin. Willow Springs. No. 557.
Muhlenbergia virescens Trin. Willow Springs. No. 565.
Agropyrum glaucum R. and S. Willow Springs. No. 563.
Poa pratensis L. Willow Springs. No. 560.
Poa annua L. Huachuca. No. 458.
Festuca myurus L. No. 465.
Festuca Arizonica. Grows on mountain-slopes and rich level places. Willow Springs, July 5 and 6. No. 623.
Panicum scoparium Lam. Willow Springs. No. 561.
Cheilanthes¹ Eatoni Baker. Fort Huachuca. April 20 to May 21. No. 437a.
Cheilanthes tomentosa Link. Fort Huachuca. April 26 to May 21. No. 451.
Cheilanthes Lindheimeri Hook. Fort Huachuca. April 26 to May 21. No. 452.
Asplenium Filix-foemina Bernh. Fort Huachuca. 1889. Letter W.
Notholaena ferruginea Hook. Fort Huachuca. 1889. Letter X.
Cystopteris fragilis Bernh. Fort Huachuca. 1889. Letter Y.
Woodwardia radicans Smith.
Equisetum laevigatum A. Br. Fort Huachuca. April and May. No. 463.

MUSCI

- Marchantia polymorpha** L. Willow Springs. No. 535.
Funaria hygrometrica Sibth. "The spores are somewhat larger than usual in this species."—C. R. Barnes. No. —

FUNGI

- Agaricus** L., sp. Mr. F. W. Anderson identifies the poor specimens as *A. campestris* probably. The following is Dr. Palmer's note: "This species of mushroom is plentiful during the rainy season. When cooked it is very firm and of better flavor than the ordinary mushroom. The Indians eat it with much relish." Fort Apache. June 21 to 30. No. 508.
Æcidium Palmeri Anderson. Journ. Mycol. vi. 122. This is the type of a new species found on *Pentstemon virgatus*, at Willow Spring.

¹Ferns determined by Mr. H. Seaton.