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## Review of the Cactaceæ of the United States.—III.

[Parts I and 2 have been printed separately, and this and succeeding parts it is intended to reprint with consecutive paging.]

### Genus MAMMILLARIA Haworth.

"Mammillary Thistle. Cactus Linn. &c. Calyx superus coloratus 10-12 fidus, laciniis subimbricatis, superne expansis, inferne coalitis in tubum nudum cylindricum; interioribus petaliformibus. Stigma subseptemfidum radiatum. Suffrutices rotundati carnosi absque axe ligneo, lactescentes aphylli, mammillis crebre tecti spiniferis; spinis subviginti in stellam ad apicem singulæ mammillæ. Flores inter bases mammillarum. Fructus bacca parva polysperma edulis coccinea, fere obconica, acidula. Semina rotundata parva pallide carne pulposa nidulantia."—A. H. Haworth, "Synopsis plantarum succulentarum, cum descriptionibus, synonymis, locis; observationibus anglicanis, culturaque," 177. 1812.

"Sepals and petals united beyond the naked ovary into a short tube. Berry juicy, oval or club-shaped. Seeds brown or black; embryo straight, without albumen; cotyledons very short, globose. Low globose or oval plants, simple or branched, covered with spine-bearing tubercles; flowers rising from the axils of the tubercles, usually small, about as wide as long, opening in sunshine only."—George Engelmann, in King's report. v. 115. 1871.

MAMILLARIA: Prince Jos. de Salm-Dyck, "Cactæ in Horto Dyckensi cultæ anno 1849," edition 2 (1850), says in a foot-note on page 5:—"Nomen genericum Mamillaria scribendum est, quia non a verbo Mamma, sed a diminutivo Mamilla deductum." Engelmann, Schumann, and various other botanists have followed Salm; the authorities at the Royal Gardens, Kew, England, still use the original spelling.

CACTUS Linnæus Syst. I, 1735,—in part, non Lemaire; Sp. pl. 466, 1753,—in part; Otto Kuntze, Rev. Gen. Pl., 1891; Coulter, Contributions U. S. National Herbarium, iii. 95, 1894.

The name Cactus, as applied to plants of this family, seems to have been first used by Linnæus, in 1735, in his "Systema Naturæ," edition 1. I take the following from a reprint of that work, published in Paris in 1830:—"Euphorbium, L. 3.—Cereus.—Opuntia, T. (Tuna, D[illenius].)—Cactus. (Melocactus, T.)."

The attempt to discard the name Mammillaria, and revive Cactus, seems to the writer illadvised; for the greater part of a century the name Mammillaria has been in use, unquestioned, by botanists and horticultur-

ists alike, and neither the "law of priority," nor the rule, "once a synonym always a synonym," should be made retroactive in a case like this.

**M. AGGREGATA** Engelm., in Emory's Rec. 157, f. 1. 1848.

Original description:—"October 18, 1846; head waters of the Gila, 6,000 feet above the sea. Proliferous in the highest degree, forming hemispherical masses often of a diameter of  $3\frac{1}{2}$ °; which are composed of 100-200 different heads or stems. Single heads conical, apparently 4 or 5' high, and  $2\frac{1}{2}$ -3' in diameter; color, bluish green; spines white or reddish. This species appears to be allied to *M. vivipara*, but is distinguished by the conical heads, and the hemispherical tufts, while *M. vivipara* has hemispherical or even depressed heads, and forms flat and spreading masses. It may be an undescribed species, in which case the name of *M. aggregata* appears to be most appropriate."—Engelmann, l. c.

Engelmann, in Ives' report, and Watson, in his Bibliogr. Index, refer this to *Cereus phœniceus*. Coulter makes it *Cereus aggregatus* in his "Revision." Perhaps a form of *C. polyacanthus*, but it may have been any one of half a dozen species so far as our positive knowledge extends, hence we consider it unwise to attempt to revive the name at the expense of discarding a well established name.

**M. ALVERSONI** Hort.

*Cactus radiosus alversoni* Coulter:—"Differs from var. *deserti* in its more robust and branching habit (becoming 12.5 cm. tall and 10 cm. in diameter), shorter and thicker tubercles, more numerous (12-14 centrals) stouter and longer (12-22 mm.) spines, all of which are black-tipped (the centrals black half way down, shading into red), and pink flowers. In the desert region of extreme southeastern California. 'Fox-tail cactus.' "

Selected specimen plants alone answer the above description; Mr. A. H. Alverson, who collects this form on the Mohave desert, and in whose honor it is named, has shown me specimens with spines white throughout, and an examination of a large series of plants has convinced me of the identity of this with *M. deserti*, *M. arizonica*, etc.

**M. APPLANATA** Engelm., Boston Journal of Nat'l History, vi. 198. 1850.

Original description:—"Simplex, depressa; tuberculis elongato-pyramidatis subquadrangulatis apice ex tomento albo lanoso demum evanescente aculeiferis; aculeis rectis 15-20 tenuioribus inaequalibus radiantibus, singulo centrali robustiori erecto; axillis nudis; floribus sordide albidis s. rubellis; ovario glabro, sepalis 8-13 lanceolatis; petalis 12-18 lanceolatis mucronatis, internis versus apicem fimbriato-denticulatis; stigmatibus 5-8 stamina brevia pauca flavida longe excedantibus flavis; baccis elongato-clavatis; seminibus subgloboso-ovatis scrobiculatis rugulosis parvis.—Rocky plains on the Piedrañales; flowers (in St. Louis) in May. Flowers forming a circle or wreath, in the larger specimens, of  $1-1\frac{1}{4}$ ' diameter, around the growth of tubercles of the same year, while the scarlet fruit is

frequently still persistent, and forms an outer circle. Plant 2½-4½' in diameter, 1-2' high, with an almost level top and depressed vertex: in larger specimen 34, in smaller ones 13 or 21, spiral rows of tubercles are most conspicuous. Radiating spines 2¼-6'' long, whitish; the 3 or 4 outer or lower are stouter and very light brown; the central spines erect, or rather somewhat inclined upwards and inwards, 2-4 (mostly 3'' long, light yellowish brown. The innermost tubercles of the preceding year appear to produce the inconspicuous flowers, which are from 9 to 12'' long, urceolate when not fully expanded in bright sunshine. Berry 8-15'' long."—Engelmann, l. c.

= *M. Heyderi* Muhlenpf. v. *applanata* Engelmann, Proc. Am. Acad. iii. 563, 1856; Cact. Mexican Boundary Report, 8, t. 9, f. 4-14.

*M. ARIZONICA* Engelmann, in Watson, Bot., Wheeler's Rept. vi. 127. 1878.

Original description:—"The largest form, which comes from Arizona, I had at one time distinguished as *M. Arizona*, but must now consider it as only a gigantic vivipara, 3-5' high, 4' in diameter, with spines often over 1' long, on rather broad and spreading tubercles. Rothrock 1874 (203), is a smaller form, from Camp Apache, Arizona."—Engelmann, l. c.

"*Coryphantha*: globose or ovate; tubercles long cylindrical, ascending, deeply grooved, bearing numerous straight, rigid spines; the 15-20 exterior spines whitish, 3-6 interior stouter and deep brown above; flowers large, rose-colored; sepals 30-40, linear-subulate, fimbriate; petals 40-50, lance-linear, curved; stigmas 8-10, white; berry oval, green, with obovate, compressed, pitted, light brown seeds. On sandy and rocky soil in northern Arizona, from the Colorado eastward (Coues, Palmer, F. Bischoff), and into southern Utah (J. E. Johnson); probably in southeastern California. Larger in all its parts than *M. phellosperma*, 3 or 4' thick; tubercles 1' long; spines 5-15'' long; flowers 2-2½' wide, very showy."—Engelmann, Botany of California, i. 244. 1880.

*Cactus radiosus arizonicus* Coulter, Contr. U. S. Nat. Herb. iii. 121.

#### **MAMMILLARIA BARBATA** Engelm.

Original description:—"Simplex, globoso-depressa; tuberculorum axillis nudis; aculeis radialibus numerosissimis pluriserialibus, exterioribus piliformibus albis sub-40; interioribus paulo robustioribus fulvis 10-15, centrali singulo robusto, uncinato, fusco, erecto; baccis oblongis, viridibus, apice floris rudimento coronatis. Cosihuiriachi.—The only specimen seen was about 2' in diameter; tubercles 4'' long; spines 3-4'' in length; fruit 5-6'' long, in a circle around the younger tubercles; seeds obovate scrobiculate, dark brown, minute."—Engelmann, Wislitz. R. 106. 1848.

"This species is easily propagated by seed, and apt to flower in the second year. The first flowers in spring (May) appear in the axils of the last, innermost tubercles of the last year, and are therefore almost central; the later ones seem to be developed from the axils of the first tubercles of the same spring! Flowers 9-10'' long, of the same diameter;

tube constricted above the exsert oval ovary; 12-13 exterior green sepals, lanceolate, cuspidate, fimbriate, 8 interior ones, reddish, longer, lance-linear, slightly ciliate; 18-21 petals, rose-red, with a deeper colored streak, lance-linear, shorter and narrower than the inner sepals, entire; stamens not half as long as petals, with oval anthers; style much longer than stamens, with 5-6 short, greenish-yellow suberect stigmas."—Engelmann, Trans. Academy of Science of St. Louis, ii. 201.

Engelmann, Proc. Am. Acad. iii. 261; Cact. Mexican Boundary, 64, t. 6, f. 9-12.

Salm-Dyck, Cact. HD. ed. 2, 82.

Labouret, Monogr. Cact. 30.

Walpers, Ann. iii. 894.

Watson, Bibliographical Index, 402.

Cactus barbatus Kuntze, Rev. Gen. Pl. 261. 1891.

—Coulter l. c. 102.

#### M. BENECKEI Ehrenberg.

"Stamm cylindrisch, meistentheils aber schief abgestumpft, nabelförmig eingedrückt, einzeln und aussprossend; Achseln anfangs wollig; Warzen dunkelgrün, hellgrün, gelbgrün, auch grün, gelb und roth, saulenförmig, unten 4 seitig, oben schief abgestumpft; Scheibe anfangs meistens kurzwoilig; Stacheln zweierlei: Aeussere 12-15, horizontal anliegend, von fast gleicher Länge, weisslich, gelblich oder an der Spitze braun. Mittlere starker, 2-6, braun oder an der Spitze schwarz, wovon 1 oder 2 nach unten, das doppelte länger, nach der Spitze zu sich verdicken und hockförmig gekrümmt sind. Stamm 2-3 Z. hoch, 2-2½ Z. Durchmesser. Warzen 4-6 Lin. lang, 1½-2 Lin. dick. Aeussere Stacheln 3-4 Lin. lang. Mittlere Stacheln 3-6 Lin. lang. Mexico. Hrn. Etienne Benecke in Mexico zu Ehren."—Carl Ehrenberg, Botanische Zeitung, ii. 833. 1844.

Ehrenberg, AGZ. 1844, 401 (reprinted).

Walp. Rep. v. —

= Goodridgii fide Hooker & Jackson, Index Kewensis, iii. 156.

= Goodrichii? fide Salm-Dyck, HD. ed. 2, 10, 91.

#### M. BICOLOR Lehmann, Del. Sem. Hamb. 1830 (Litt.-Ber. zu Linn. 1831. 11).

Original description not seen.

"Depressa, ovata, s. cylindracea, prolifera; axillis lanatis; tuberculis parvulis conicis; aculeis exterioribus 16-20 tenuissimis recurvato-radiantibus, centralibus 2-4 rigidis, majoribus albis apice nigris interdum subpolicaribus, supremo plerumque longissimo incurvo; floribus parvulis purpureis; stigmatibus 5. Abundant on the calcareous hills of the Rio Grande below Laredo, Texas, Dr. Poselger: fl. June and July.—Plant 3-12' high, the larger specimens 2-3' in diameter; radial spines 1-2, lower central ones 4-5, the upper 6-10" long. Flower about 9" long."—Engelmann, Proc. Am. Acad. iii. 263;—"M. bicolor, Lehm., is not a Texan plant, as has been stated inadvertently in Synops. p. 7. Dr. Poselger found it on another

Rio Grande, between Tampico and Real del Monte, Mexico."—Engelmann in *Trans. Acad. St. Louis*, ii. 202.

*M. CÆSPITOSA* Gray, *Struct. Bot.* 421 f. 838.

Original description not seen.

= *Missouriensis cæspitosa* fide Watson, *Bibliographical Index*, 403, 191

*M. CALCARATA* Engelmann.

Original description:—"M. *sulcata*, n. sp.: *cæspitosa*; tuberculis ovato-oblongis sulco subinde apicem versus proliferò superne exaratis apice spiniferis; spinis rectis radiantibus cinereis e tomento albido deciluo (in plantis adultis spina centralis subrecurva majore) ortis; floribus centralibus fasciculatis e tomento ortis glaberrimis, tubo brevi; sepalis lanceolatis acuminatis viridi-flavescentibus margine integerrimis; petalis longioribus lanceolatis apicem versus ciliato erosio cuspidatis sordide flavis ad basin intus filamentisque brevibus rubicundis; stylo supra stamina exserto; stigmatibus 7-10 flavis; baccis oblongis virescentibus.—With [*M. similis*, &c.]. Flowers opening for 2 or 3 days, in direct sunshine, 2' or more in diameter. On account of the central flowers, this should form, with *M. vivipara*, a distinct section. From that species it abundantly differs, not only in the color of the flower and the spines, but in the entire and smooth sepals, denticulate petals, etc."—Engelmann, *Boston Jour. Nat. Hist.* v. 246. 1845.

"Near Pawnee fork."—Torrey in Emory's *Recon.* 408.

"*M. CALCARATA*. *M. sulcata*, Engelm. *Pl. Lindh. l. c.*, non Pfeiffer. Near *M. scolymoides*, Schdw., but sufficiently distinct, according to Prince Salm.—Rocky and hard, clayey soil, on the Upper Guadalupe. My specimens from there are mostly densely *cæspitose*; tubercles in 13 oblique rows; proliferous groove producing the buds always near its upper end. Flowers 2' long and 2-2½' in diameter; sepals (or rather outer firmer perigonial leaves) 20-35; petals (inner more delicate petaloid perigonial leaves) 30-35; yellow (dirty yellow only when fading), reddish at the base."—Engelmann, *Boston Jour. Nat. Hist.* vi. 195-6. 1850.

Engelmann, *Proc. Am. Acad.* iii. 267; *Cact. Mexican B.* 14, t. 74, f. 1.

Salm, *Cact. HD.* ed. 2, 131.

Labouret, *Monogr. Cact.* 142.

Walpers *Ann.* v. 37.

Watson, *Bibliographical Index*, 462.

Coulter, *Contr. U. S. Nat. Herb.* ii. 128.

*Mamillaria strobiliformis* Mhlpfdt. *AGZ.* 18, 18, 19:—"Ovata, viridis, mamillis adpressis et spiraliter dispositis, conicis, basi depressis 7-9''' longis, supra sulcatis, sulcis junioribus lanatis, senioribus nudis, axillis albo lanatis, eglandulosis; areolis junioribus albo-lanatis, senioribus nudis. *Aculeis radiantibus 7-9 griseo-albis, centrali robustiore griseo-fusco.*"—Texas, Roemer.

Mhlpfdt. *Bot. Zeit.* vi. 597.

Scheele, *Roem. Texas*, 435. 1849.

Not *strobiliformis* Scheer, nor Engelmann.

*M. COMPACTA* Engelm.

Original description:—"Simplex, hemisphaerica; s. depresso-globosa: tuberculis abbreviatis, ovoideo-conicis, sulcatis; areolis ovato-lanceolatis, junioribus albo-tomentosis; aculeis omnibus radialibus, 13-16 subæqualibus, robustis, recurvatis, adpressis, intertextis, albidis, superioribus apice fuscis; sulcis tuberculorum axillisque junioribus et vertice tomentosis; floribus in vertice congestis; baccis ellipticis perigonio coronatis, viridibus; seminibus obovatis, laevibus fulvis. Cosihuiriachi. Plant 2-3½' in diameter and 1¼-2½' high; tubercles in 13 rows, 4" high, 6" wide at base; spines interlocking, and thereby often deformed and twisted, stout, 7-10" long."—Engelmann in Wisliz. Rep. 105. 1848.

\*\*\*"Floribus in vertice dense lanato centralibus; sepalis (17-19) lanceolatis acutis integris (rufescentibus, interioribus margine flavis); petalis (28) oblongo-lanceolatis mucronatis versus apicem denticulatis (sulphureis); stigmatibus 7-8 cuspidatis flavicantibus supra stamina (sulphurea) paulo exsertis. Flowers at the end of June and beginning of July in St. Louis. Flower-bud dark reddish-brown; flower about 15" long and of the same diameter. Petals 6" long and 1¼" wide. Stigmata 2" long, cuspidate; as in *M. vivipara*, while all other species known to me have obtuse stigmata."—Engelmann, Boston Jour. Nat. Hist. vi. 196. 1850.

Engelmann, Proc. Am. Acad. iii. 266; Cact. Mex. B. 12, t. 74, f. 2, seeds. Walp. Ann. iii. 894.

Watson, Bibliographical Index, 402.

Cactus compactus Kuntze, Rev. Gen. Pl. 260; Coulter, l. c. iii. 113.

*M. CONOIDEA* De Candolle.

Original description:—"Simplex, ovata, conica, axillis junioribus lanatis, mammis ovatis confertis, areola juniorum subtomentosa, aculeis rectis rigidis exterioribus 15-16 radiantibus, centralibus 3-5 erecto-divergentibus fuscis longioribus. Mexico, Coulter, No. 52. Affinis *M. crebrispinæ*. An *M. conica* Haw? Flores rubro-violacei, fere ex apice caulis orti, pauci."—DC. Rev. 112. 1829.

"Found only south of the Rio Grande."—Engelm. Proc. Am. Acad. iii. 268.

*M. DACTYLITHELE* Labouret, Monogr. Cact. 146 = macromeris.

*M. DECLIVIS* Dietr.

Original description:—"Humilis, applanata, glaucescenti-virens; axillis sublanatis; mamillis erectis, pyramidatis, tetragonis, areolis minimis vix tomentosis; aculeis marginalibus 14, in orbem dispositis, setaceis, albidis, basi apiceque rubiginosis, aculeo centrali unico, porrecto, crassiore, subulato, subbreviore. Habitat in Texas."—Dietr. AGZ. 1850. 235.

"Centrispinæ. Corpus Christi, Texas."—Poselger, AGZ. 1853, 94.  
= Heyderi? fide Engelmann, Proc. Am. Acad. iii. 263.]

## BIBLIOGRAPHY.

SUCCESS: D 22, 1898; Ja 7, 1899.

We are pleased to note the change from a monthly to a weekly which has just taken place; Success is a handsomely illustrated journal of 20 pp., 10½ x 14 inches, full of instruction and entertainment. Orison Swett Marden is editor; published at Cooper Union, New York City; \$1.50 a year.

NAUTILUS, the: xii. 1-7., My-N 1898.

This useful magazine, edited by the conservator of the conchological section of the Academy of Natural Sciences, Philadelphia, is prompt each month in making its welcome appearance; \$1 a year.

SUCCESS WITH FLOWERS: ix. 1, 2, O, N, '98.

This sprightly little magazine has entered on its ninth volume, and offers some attractive premiums for amateur gardens; West Grove, Penn.

AMERICAN Mo. REV. of REVIEWS:

January brings an interesting number of the 'busy man's magazine,' articles on 'Our constitution and expansion,' 'the Red Cross in the summer's work,' the 'Emperor of Peace,' Calixto Garcia, George Gray Barnard, and information on passing events. 128p. 25c. 23 Astor Pl., N. Y.

## EDITORIAL.

Several months devoted to minig, and five months spent in Saint Louis, Washington, New York, Boston and elsewhere in the eastern states, have not been conducive to the prosperity of our journal, which has from necessity been in abeyance in the editor's absence; having again resigned the handbag and the pick for the pen—temporarily at least, we hope our readers may be benefitted somewhat from the opportunities we have so recently enjoyed.

## NOTES AND NEWS.

SEMPERVIVUM CALCAREUM Jord. Obs. Pl. Crit. vii. 26. 2849.

S. Californicum hort. ex Baker, Gard. Chron. 1874. II. 103.

This European plant has become well established in Southern California gardens under the name of Cotyledon Californica; I have never seen the plant in bloom, and am indebted to the Royal Gardens at Kew, England, for its determination. Very pretty for borders, rockeries, etc.

HELIX FACTA Newcomb.

Mr. F. W. Bryant, during a recent call, reported finding upwards of fourteen hundred specimens of this snail, under cacti, on Santa Catalina Island,—not all living, however, and as they would have been destroyed with the cacti, the gentleman is not open to criticism for taking so many.

**HELIX INTERCISA** W. G. Binney.

Our cabinet contains several fine specimens of this snail, collected on Santa Catalina Island by the late Captain Porter.

**H. COLORADOENSIS** Stearns.

Dr. Stearns identifies several specimens from the western borders of the Colorado Desert, San Diego county, as belonging to this species; the editor found it apparently rare, around the rock house spring, on the old Ft. Yuma and San Diego stage road,—commonly known now as Mountain Spring.

Beck binocular perpendicular and lateral extension microscope for sale.

Cost \$50—what cash offer?

**TETRACOCCLUS DIOICUS** Parry.

This shrub was found by the editor, in the spring of 1898, on hills north of the San Luis Rey river, near the northern limits of San Diego county, in great abundance.

This number is mailed January 31, 1899.



**PELECYPHORA ASPELLIFORMIS** Ehrenb.



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## Review of the Cactaceæ of the United States.—IV.

MAMMILLARIA MISSOURIENSIS Sweet, Hort. Brit. 171, non Scheer.

Don, Mill. iii. 160.

Dietr. Syn. Pl. iii. 94. 1843.

Coulter, l.c. ii. 127.

Watson, Bibliographical Index, 403.

Cactus missouriensis Kuntze, l.c. 259; Coulter l.c. iii. 110.

C. mamillaris Nuttall, Gen. i. 295—non Linn.—1818

James, Long's Exped. London ed. ii. 140.

Torrey, Ann. Ly. N. Y. ii. 202.

Eaton & Wright, Botany North America, ed. 8, 163.

M. simplex Torrey & Gray, Fl. i. 553.

M. notesteinii Britton, Bull. Torrey Club, xviii. 367. 1891.

M. caespitosa Gray, Struct. Bot. 421, fig. 838.

M. Nuttallii Engelmann, in Gray, Pl. Fendl. (Mem. Am. Acad. iv. 49):—

"Simplex (an semper?), globosa, axillis tuberculorum ovato-cylindricorum supra leviter sulcatorum subtomentosis; areolis junioribus albo-tomentosis; aculeis rectis albidis, radialibus 13-16 subinæqualibus setaceis, centrali porrecto robustiore; floribus ex axillis tuberculorum hornotiformum centralibus (ex rubello flavicantibus); sepalis petalisque oblongo-lanceolatis; sepalis 10-13, brevioribus exterioribus ciliato-fimbriatis obtusiusculis, interioribus apice laceris acutis; petalis 20-23 integris breviter abrupte mucronatis: stylo supra stamina (rubella) paulo exserto, stigmatibus circa 5 brevissimis erectis adpressis viridibus; baccis lateralibus subglobosis coccineis. Cactus mamillaris, Nutt., non Linn.—On high, dry prairies, about Fort Pierre, on the Upper Missouri; flowering in May.—My specimen is  $1\frac{1}{2}$ ' high, and of the same diameter; the tubercles 6 or 7'' long, in 8 spiral rows, slightly sulcate. Radial spines 4 or 5; the central one 5-6'' long; the young spines at the apex slightly brownish. Flowers an inch long, and, when fully expanded, of the same diameter; petals about 2'' wide, acute, abruptly mucronate; stigmas only  $\frac{1}{2}$ - $\frac{3}{4}$ '' long, erect. The fruit ripens the following spring, and, as well as the seed, is very similar to that of *M. similis*, but only half as large, although the pits of the globose black seed are of the same size."

M. NIVEA Wendland, f. Cat. Hort. Herrenh. 1835.

Pfeiffer Enum. 27.

Walp. Rep. ii. 289.

= bicolor fide Watson Bibliographical Index, 402.

= bicolor longispina fide Fœrster Handb. ed. 2, 288. 1886.

**M. NOTESTEINI** Britton.

Original description:—"Stems oval, simple or cæspitose, about 3 cm. in diameter. Tubercles nearly terete and about 6 mm. high; spines 12-18, white, becoming gray with age, weak and slender, 8-12 mm. long, spreading, pubescent throughout. Usually each tubercle bears a central spine which is longer and stouter than the others, and is frequently tipped with pink; fl. 15-25 mm. in diameter, ash-gray, tinged and pencilled with a delicate pink.

Petals broadly linear-oblong, mucronate-tipped; fr. obovoid; seeds black, globose, pitted. Found in gravelly soil, near a small creek, in the vicinity of Deer Lodge, Montana, by Prof. F. N. Notestein, June 4th, 1891."—Britton, Bull. Torrey Club, xviii. 367. D. 1891.

M. notesleini Britton l.c. 350 (error).

= missouriensis.

**M. PECTINATA** Engelmann.

Original description:—"simplex, globosa; tuberculis conicis abbreviatis, summis floriferis teretibus longioribus sulcatis; areolis oblongis; aculeis 16-24 rigidis recurvis intertextis subæqualibus s. in tuberculis summis superioribus longioribus fasciculatis omnibus radiantibus corneis s. albidis; floribus magnis sulphureis. On the Pecos river, in western

Texas: fl. July. Plant 1-2' in diameter. Lower tubercles 2-3, floriferous ones 5-6'' long; spines 3-5, upper fasciculated ones 6-9'' long. Flower 2½-3' in diameter; seed 0.9'' long."—Engelm. Proc. Am. Acad. iii. 266.

Engelmann, Cact. Mexican Boundary, 12, 64, 74, t. 11.

Walp. Ann. v. 36.

Watson, Bibliographical Index, 403.

Coulter l.c. ii. 128.

Cactus radians Kuntze, Rev. Gen. Pl. 261; Coulter l.c. iii. 113.

Cactus radians pectenoides Coulter, l.c. iii. 114.

Cactus pectinatus Kuntze l.c. 259.

? = radians DC. [Rev. 111] fide Engelm. l. c. 74.

**M. PHELLOSPERMA** Engelmann.

Original description:—"(*M. tetrancistra*, E. in part, Sill. Journ. Nov. 1852): ovata, subsimplex; tuberculis teretibus axilla lanata setigeris; aculeis radiantibus 40-60 biseriatis, exterioribus brevioribus tenuioribus, centralibus 3-4 robustioribus atrofuscis inferiore s. pluribus hamatis; floribus lateralibus; bacca pyriformi subsicca coccinea; seminibus globosis rugosis nigris massa fusca suberosa majore arilliformi auctis. From the Gila to the Eastern slope of the California mountains.—The name originally given had to be altered because very rarely, if ever, are 4 hooked spines seen. In the original description this and [*grahami*] were confounded.—Plant 2-4' high. Radial spines 4-6'', central ones 5-9'' long.—Apparently near *M. ancistrodes*, Lem., which, however, has the radial spines all homogeneous."—Engelmann, Proc. Am. Acad. iii. 262.

- Engelmann, Cact. Mexican B. 6, t. 7.  
 —Ives' Report, 12.  
 —King's Report, v. 115.  
 —Botany California, i. 244.  
 Engelmann & Bigelow, Pacific R. Rep. iv. 27.  
 Torrey, Pacific R. Report, v. 360.  
 Walpers, Ann. v. 34. 1858.  
 Watson, Bibliographical Index, 403.  
 Fœrster, Handb. Cact. ed. 2, 318.

"*Mamillaria tetrancistra*, n. sp.: subglobosa; aculeis radialibus brevibus albis numerosis, centralibus 4 longioribus cruciatis uncinatis; floribus centralibus parvulis flavido-rubellis; stigmatibus 3, bacca coccinea pyriformi; seminibus nigris hilo spongioso fusco auctis. From San Diego to the junction of the Gila with the Colorado.—M. Goodrichii, Sbbeer, obtained on the island of Cerro, on the coast of California, is distinguished by the lower central spine only being hooked, by much smaller tubercles, etc."—Engelm. Am. Jour. Sci. II. xiv. 337-338. N. 1852.

- Bigelow, Pacific R. Report, iv. 15.  
 Coville, Cont. U. S. Nat. Herb. iv. 45, 49, 110, 243, 244, 247.  
 Cactus phellospermus Kuntze, l.c. 261.  
 C. tetrancistrus Coulter l.c. iii. 104.

As *tetrancistra* is to be cited as a synonym of *grahami* in part, it seems unwise to attempt to revive its use at the expense of a more appropriate and well established name. The plant referred to this species, on page 68, from Valle de las Virgenes, proves by the seed to be closely allied to what K. Brandegee considers to be true *Goodrichii*.

**M. POTTSII** Scheer.

Original description:—"M. caule cylindraceo basi tandem aut superne ramoso, axillis sublanuginosis, mamillis ovato-obtusis supra laevissime sulcatis, sulculo prolifero, pulvillis nudis, aculeis exterioribus valde numerosis gracilibus albis patentissimis radianter intertextis, centralibus 7 validioribus rigidis expansis, summo longiore recurvatum erecto, omnibus ima basi nodulosis apice fulvo-sphacelatis. Caulis spithameus, diametro 12-15 lineari. M. sphacelatae proxima, sed aculeis multo numerosioribus plantam tegentibus. Flores adhuc ignoti."—Salm, Cact. HD. ed. 2, 104.

- Walp. Ann. v. 37.  
 Labouret, Monogr. 72.  
 Salm, l.c. 13.  
 Scheer, Seem. Bot. Herald, 287.  
 Watson, Bibliographical Index, 403.  
 Coulter, l.c. ii. 128.  
 Engelmann, Proc. Am. Acad. iii. 268.  
 Fœrst. l.c. 413.  
 Cactus pottsii Kuntze, l.c. 261; Coulter l.c. iii. 118.

**M. PUSILLA****VAR. TEXANA ENGELM.**

Original description:—"Ovato-globosa, prolifera, caespitosa; tuberculis teretibus axilla longelanatis; aculeis pluri-seriatis, extimis 30-50 capillaceis crispatis, interioribus 10-12 rigidioribus brevioribus albidis, intimis 5-8 longioribus rigidis rectis versus apicein fuscatis; floribus lateralibus rubellis. On the Rio Grande, near Eagle Pass and southward: fl. April-June.—Plant 1-2 inches high; spines 3-6 lines, flowers 7-10 lines, long.—seems scarcely distinct from the well-known West Indian *M. pusilla*."—Engelm. Proc. Am. Acad. iii. 261. 1856.

**M. RADIANUS DC.**

Original description:—"simplex, subglobosa, axillis nudis, mammis ovatis magnis, areola glabriuscula, aculeis 16-18 radiantibus albidis rigidis, junioribus subtomentosis, centralibus nullis. Mexico. Coulter, No. 35. Variat apice obtuso aut subdepresso, aculeis albidis aut subflavidis. Pl. circiter 3 poll. alt. et diam.; aculei 5-6 lin. longi."—DC. in Mem. Mus. Par. xvii. III. 1828.

F. 384.

Cactus radians Kuntze, l. c. 261.

Coulter l. c. iii. 113.

Cactus radians pectenoides Coulter, l. c. iii. 114.

*M. radians* Hort. ex Salm. Cact. H D. ed. 2. 20 = *M. cornifera* fide Index Kew. iii. 159.

**M. RECURVATA Engelm.**

Original description [sub recurvispina]:—"simplex, depresso-globosa; tuberculis ovatis profunde sulcatis confertis; areolis obliquis ovatis, aculeis radialibus 12-20 rigidis recurvis intertextis albidis corneisve, aculeo centrali singulo (raro binis) robustiore longiore decurvato; floribus flavicantibus extus fuscatis ex axillis junioribus villosissimis. Sonora: fl. July. Single heads 3-8 inches in diameter; tubercles 5-6 lines long; spines 4-9 lines long, upper ones often a little longer than the lower ones; central spine 6-10 lines long; darker. Flowers 1½ inches long. This plant bears the closest resemblance to [*M. compacta*], and must perhaps be classed with it, but in the dry specimen before me the flowers are not exactly vertical, as in that species."—Engelm. Proc. Amer. Acad. iii. 266. 1856.

**"M. RECURVISPINA**

Engelm. in Cact. Mex. Bound. 12; Synops. 10. As there is already a species named thus by Vriese (see Walp. Rep. ii, 301), I now name the Arizona species *M. recurvata*. *M. recurva*, Lehm., is a form of *M. macracantha* DC. fide Salm."—Engelm. Trans. Acad. Sci. St. Louis, ii. 202.

Watson, Bib. Index. 404. 1878.

Cactus recurvatus Kuntze, l. c. 259. 1891.

Coulter, l. c. iii. 112. 1894.

*M. recurvispina* Engelm. Proc. Am. Acad. iii. 266. 1856. (non Vriese)

—Cact. Mex. Bound. 12.

F. 398. 1886.

**M. ROBUSTISPINA** A. Schott.

Original description:—"simplex s. cæspitosa; tuberculis patulis teretibus magnis sulcatis; areolis junioribus dense tomentosus; aculeis radialibus 12-15 robustis inferioribus robustioribus saepe curvatis, superioribus rectis fasciculatis paullo tenuioribus, centrali singulo valido compresso recurvato, omnibus subpollicaribus corneis apice atratis; floribus luteis ex axillis junioribus tomentosissimis; seminibus magnis obovatis fuscis lævibus. Sonora, on grassy prairies: fl. July. Tubercles nearly an inch long, characterized by a very slender, constricted tube, very different from the wide tube of [*M. scheerii valida*]. Seeds fully  $1\frac{1}{4}$  lines long, larger than those of any other *Mamillaria* examined by me: embryo with some albumen, curved; cotyledons foliaceous! approaching the structure of the seed of most *Echinocacti*."—Engelm. Proc. Am. Acad. iii. 215. 1856.

Engelm. Cact. Mex. B. 11. t. 74. f. 8 (seed).  
Walp. Ann. v. 36,  
Watson, Bib. Index 404.  
F. 400.  
*M. robustissima* Schott, ex E. 1024 (error).  
*Cactus robustispinus* Kuntze, l.c. 261.  
Coulter, l.c. iii. 112.

**M. SALM-DYCKIANA** SCHEER.

Original description:—"Infeleciter periit hæc insignis species a Dom. Potts, prope Chihuahua, cum præcedente collecta. Ex reliquiis plantæ tamen judicari potest caulem esse subglobosum, crassum. Mamillæ, axillis floccose lanatis, ingentes sunt, latissimæ sphæroideo-retusæ, et sulco tomentoso fere bipartitæ; pulvilli subimmersi, nudi, aculeis instructi exterioribus 7-8 rigidissimus, sesqui-pollicaribus, recurvulis, radianter patentissimis, centralique uno validissimo, erecto, fere bipollicari. Accedunt insuper, in mamillis senioribus, aculei adventitii 3-6 sesquipollicem longi, graciles, recti aut contorti, e parte supera pulvilli, et quasi e sulco orti. Flores hucusque ignoti."—Salm, Cact. HD. ed. 2. 134. 1850.

"*M. caule subgloboso robusto glaucescente axillis tomentosus tandem nudis, mamillis magnis crassis supra sulco profunde exaratis, junioribus hemisphaericis senioribus rhomboideo-depressis latissimis, pulvillis mox nudis; aculeis exterioribus subaequalibus 8-10 radianter patentibus, centralique solitario erecto validissimis rigidissimis basi noduloso-incrassatis griseo-fulvidis aut brunneis, cum adventitiis summis gracilioribus 1-5.*"—Salm-Dyck, A G Z. 1850. 394.

Labouret, Monogr. 147. 1858.  
F. 405.  
*Cactus Salm-Dyckianus* Kuntze, l. c. 261.  
Coulter, l.c. iii. 113.

**VAR. BRUNNEA** Salm-Dyck.

"Aculeis exterioribus crassioribus, inferioribus 5 cinereo-brunneis, patulis, seu minus radianter expansis."—Salm-Dyck, AGZ. 1850. 394.

**M. SCHEERII** Muehlenpfordt.

Original description:—"Robusta, magnimanua, globosa, ad basin prolifera, axillis latis tomentosis, mamillis glaucescentibus remotis magnis, latitudine fere duplo longioribus, subprismaticis, facie superiori profunde sulcata quasi biloba, sulco pubescente, uno vel pluribus glandulis munito; aculeis validis, e mamillarum apice nascentibus, citrinis vel saepe albescentibus, deinde luteis vel rubris, brunneo-vel nigro-sphaecelatis; exterioribus 8 parum reflexis, centrali uno longissimo robustissimo rector mamillarum longitudo 14-16 lin.; latitudo 6-7 lin.; aculei longitudo 6-14 lin. Habitat in Mexico."—Mhlpft, AGZ. 1847. 97. t. 2. [non AGZ. 1845. 346; 1846. 373.]

Bot. Zeit. v. 495. 1847.

Salm, Cact. H. D. ed. 2, 133. 1850.

Lab. Monogr. 147. 1858.

Scheer, Scem. Bot. Herald, 289.

Engelmann, Cact. Mexican Bound., 11.

Watson, Bibliographical Index, 404. 1878.

M. Brownii Toumey. Bot. Gaz. xxii, 253-4. 23 S. 1896.

Considerable confusion has arisen over the prior use of this name by the same author in earlier volumes of the *Allgemeine Gartenzeitung* (1845, 346; 1846, 373 = *M. polymorpha* Scheer, = *M. conoidea* fide Index *Kewensis*). The rule "once a synonym always a synonym" might be put in use in this case, as the plant is burdened with other names—*M. Salm-Dyckiana* and *M. robustispina* doubtless being both identical with this species.

Cactus *scheerii* Kuntze, Lc. 261. 1891.

Coulter, Lc. iii. 111. 1894.

Cactus *Brownii*, Toumey, Bot. Gaz. xxii, 253.

**VAR? VALIDA** Engelm.

Original description:—"Magna, ovato-globosa, subsimplex, glaucescens; tuberculis remotis patulis magnis e basi lata subcylindricis supra sulco profundo glandulis paucis munito (juniore lanato) subbilobis; areolis junioribus dense lanatis; aculeis 10-20 rectis robustis basi bulbosis albidis s. citrinis apice fuscatis, radialibus 9-16; centralibus 1-5 validioribus angulatis; floribus flavis ex axillis junioribus tomentosissimis. Sandy ridges in the valley of the Rio Grande near El Paso; fl. July. The largest of our Northern Mamillariae, 7 inches high and 5 in diameter; tubercles 1-1½ inches long; spines 10-18 lines in length, very stout, especially the central and lower radial ones. Flower 2 inches long, yellow. Fruit not seen. - *M. scheerii* from Chihuahua, according to Prince Salm's description, is a smaller plant, with single central spines one inch in length, and 8-11 much shorter radial spines; the areolae are described as naked:—nevertheless our plant is probably only the Northern form of this species."—Engelm. Proc. Am. Acad. iii. 265. 1856.

Engelmann, Cact. Mexican B. 10. 1859.

Watson, Bibliographical Index, 404. 1878.

Coulter, Cont. U. S. Nat. Herb. ii. 127. 1891.

"The plant here described as a variety exactly agrees with some original specimens of *M. scheerii* preserved in the collection of Prince Salm-Dyck."—Engelm. l.c. 74. 1859.

*Coryphantha scheerii* Lem. Cact. 35.

*M. SCOLYMOIDES* Scheidw.

Original description:—"Globosa, pallide virens; axillis lanatis; mammillis subsulcatis, adscendentibus imbricatis; areolis lanatis, tandem nudis; aculeis numerosis, inferioribus radiantibus carneis; superioribus fasciculatis albis apice nigrescentibus rigidis; centrali uno recurvulo nigro basi griseo. Mexico."—Scheidw. AGZ. 1841. 44.

Engelmann, Proc. Am. Acad. iii. 267.

—Cact. Mex. B. 14. 74.

Walp. Rep. ii. 259.

Salm. Cact. HD. ed. 2, 131.

Lab. Monogr. 144.

Coulter, Cont. Nat. Herb. ii. 128. 1891.

Watson, Bibliographical Index, 404.

F. 412.

*Cactus scolymoides* Kuntze, l.c. 261.

Coulter, l.c. iii. 115.

*Cactus scolymoides sulcatus* Coulter, l. c. 116, is made by Coulter to include "*M. strobiliformis*" Muhlenpf., AGZ. 1848, 19. (not Scheer 1850), and *M. calcarata* Engelm. (*Cactus calcaratus* Kuntze, l. c. 259),—see p. 61.

*M. STROBILIFORMIS*

Original description:—"simplex ovato-conica, tuberculis imbricato-adpressis, conicis, applanatis, sulcatis; aculeis rectis radialibus, sub-10 albidis, centralibus 3 fusco-atris, 2 minoribus sursu mversis, singulo longiore porrecto; floribus in vertice lanato centralibus, ovario lanoso; sepalis sub-10 lanceolatis, acutis, integris; petalis sub-24 ovato-lanceolatis, mucronatis, integris vel versus apicem erosis; stigmatibus 7 flavis erecto-patentibus exsertis. Rinconada, on rocks; flowers in June. About 3 inches high, and 2 inches in diameter below; tubercles in 10 to 13 oblique rows closely adpressed, so as to give the whole plant the appearance of a pineapple or cone, tomentose in the groove and the axils, about 6 lines long; radial spines 3 to 5, central 5 to 8 lines long; flowers central, 3 to 5 in a cluster together imbedded in long and dense wool, about 15 lines long and wide; petals deep purple."—Engelm. Wisliz. Rep. 30 (1848).

Engelm. = conoidea [see p. 62.] fide Watson, Bib. Index, 402.

Scheer = tuberculosa.

Muhlenpfdt. = calcarata, see p. 61. fide Watson l.c. 402.

*M. strobiliformis* Mhlpfdt. see p. 61.

*M. tetrancistra* Eug. = *Grahami* and *phellosperma* (see latter).

## MAMMILLARIA TEXENSIS Lab.

"Tige de forme globuleuse, à sommet ombiliqué; aisselles nues; mamelons tres-longs, legerement tetragones, à arêtes émoussées, arrondies, sommet tronqué et base tout à fait rhombique, d'abord comprimés et plus épais que larges, puis plus tard déprimés, plus larges qu'épais; les jeunes, manifestement adhérents les uns aux autres par la base près du point de leur insertion sur la tige, sont disposés par séries spirales subverticales; aréoles apicillaires, rondes, garnies de tomentum blanc abondant d'abord, caduque par la suite; 18 aiguillons extérieurs greles, rayonnant très-régulièrement, blancs, les supérieurs moins longs, les inférieurs un peu plus; en outre, 1 aiguillon intérieur central dressé, blanc, plus court, plus vigoureux que les autres, à pointe brune. Les mamelons atteignent 1 cent. de longueur environ, ils sont greles et d'un beau vert-glaucque; les aiguillons des jeunes aréoles sont d'abord peu divergents, subfasciculés, avec l'âge ils deviennent de plus en plus divergents, puis enfin tout à fait rayonnants dans un meme plan et adprimés. Texas."—Lab. Mon. 89. 1858.

= *M. heyderi* fide. Watson.

*M. TUBERCULOSA* Engelm.

Original description:—"ovata s. ovato-cylindrica, simplex s. ad basin parce proliferā; tuberculis e basi rhomboidea ovatis abbreviatis obtusis profunde sulcatis demum suberosis persistentibus confertis, axillis villosissimis; aculeis exterioribus 20-30 rigidis albidis, interioribus 5-9 robustioribus cæsiopurpureis sphaclatis, superioribus longioribus erectis, infimo brevioribus robusto porrecto s. deflexo; floribus in vertice densissime tomentoso centralibus pollicaribus dilute roseis; bacis elongato-ovatis rubris; seminibus minimis scrobiculatis. On the mountains near El Paso, and eastward: fl. May and June. Plant 2-5 inches high; tubercles 2½-3 lines long, dry and hard, not fleshy unless very young, nor shrivelling when old, but losing the spines and covering the lower part of the plant like corky protuberances. Outer spines usually 2-4, rarely 5 or 6, lines long; interior spines 4-9 lines long; those of the upper tubercles forming a tuft of grayish-purple color on top of the plant. Flowers very pale purple, one inch in diameter. Berry red, ¼' long, ¼' thick, crowned with the remains of the flower. Seeds short, thick, about half a line long. — The short, corky tubercles, with very deep grooves, and very woolly when young, together with the long red fruit, distinguish our species from all the allied forms."—Engelm. Proc. Amer. Acad. iii. 268. 1856.

Engelm. Cact. Mex. B. 14. t. 12. f. 1-16.

Walp. Ann. v. 37.



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## Review of the Cactaceae of the United States.—V.

### CEREUS BRANDEGEEI Coulter.

"Size, habit, and number of ribs unknown: ribs tuberculate, with areolae 10-15 mm. apart: spines at first variegated, dark and reddish, becoming more or less ashy-black; radials 10 to 16, rigid, terete, radiant, mostly uniform, 8 to 12 mm. long; centrals almost always 4, very stout and prominent, 3 to 4 cm. long, cruciate, conspicuously angled and compressed, sometimes twisted, the lowest usually the most flattened and sword-like (2 to 3 mm. broad): flowers red, 4 to 5 cm. long, with conspicuous woolly and spine-bearing areolae over the ovary and lower part of the calyx: ripe fruit not seen.—Type in Herb. Brandegee, Lower California, El Campo Allemand and San Gregorio. Specimens examined: Lower California (Brandegee of 1889)."—Coulter, Cont. U S Na Hb iii, 389. (Ap. 1, 1896.)

Orcutt, Review of the Cactaceae, i. 7. Jl. 3, 1897.

Plant caespitose, often 2 feet or more across, consisting of many cylindrical heads, mostly 6 or 8 inches high, 1½ to 2 inches in diameter, with 8 or 9 interrupted, strongly tuberculate, ribs. The young spines frequently tinged with brilliant magenta, the older spines often of an ivory white, with centrals of a deep magenta—making a very handsome appearance. Abundant in the vicinity of the mines at Calmalli, and eastward nearly to the shores of the Gulf of California. This has much the same aspect as *Cereus Engelmanni*, with similar variations in the color of the spines.

### ECHINOCACTUS FORDII Orcutt

Orcutt, Review of the Cactaceae, 1:56.

Globose, 6 inches or more in diameter, with about 18 tuberculated narrow ribs closely set with clusters of stout ashy gray spines, 4 central, annulated, the longest 1¼ inches long, and hooked; 2 slender spines above with about 14 divergent radials; flower an inch across, about 32 rose purple petals in 2 series, 9 greenish stigmata, style tinged with red, filaments red at top and yellow at base, anthers orange yellow. Near Lagoon Head, Baja California. Named for Lyman M. Ford, of San Diego, who has taken a great interest in cacti. Apparently the same plant was distributed in 1894, from near San Quintin bay, as a form of *E. peninsulae*.

### OPUNTIA BASILARIS E-B.

"Humilis; articulis obovatis seu triangularibus glaucescentibus pubescentibus e basi proliferis; foliis minutis; pulvillis subconfertis fulvo-

villosis setas gracillimas demum numerosissimas fulvidas et subinde aculeolos setisformes caducos gerentibus; floris purpurei ovario obovato pulvillis plurimis instructo; stigmatibus 8 in capitulum congestis; bacca obovata late umbilicis (sicca?); seminibus magnis crassis subregularis. On William's River, the Colorado, and the Mojave, and down to the Gila: flowers April and May. Habit very different from any other of our *Opuntifæ*; the stout obovate or fan-shaped joints (5-8 inches long) originate from a common base, forming a sort of rosette. Leaves only 1 line long, 4-6 lines apart; pulvilli red-brown, somewhat immersed. Flower about 2½ inches in diameter; ovary with 40-50 pulvilli. Fruit apparently dry, thereby approaching the next section [*Xerocarpeæ*]. Seed 3 lines in diameter, 2 lines thick. Mr. Schott has observed, on the dividing ridge of the California mountains, west of the mouth of the Gila, and again in the Santa Cruz valley, Sonora, a very similar but suberect species, 3 feet high, spineless, inclined to assume a purplish hue, which he seems to have confounded with *O. basilaris*. Can it be *O. rufida*, or is it an undescribed species?"—E, Syn 298 (42).

V. RAMOSA Parish.

"Spreading, and the joints freely branching above; joints and fruit glabrous; otherwise as in the species. Dry washes and gravelly benches of the Colorado and Mojave deserts, and occasionally in the less arid regions; dry ridges, 7000 ft. alt., on the northern side of the San Bernardino Mts., near Bear valley; San Mateo Pass; San Jacinto Plains as far as Box Springs; Temecula; Coast Range at least to the Santa Margarita River. This variety is the common form of the species in Southern California; only near the summit of the Cajon Pass have I seen plants basilar branched as defined by Engelmann and figured in Pac. R. R. Rept., iv. t. 13. f. 5."—Parish, Torr cl b 19:92.

OPUNTIA CAMANCHICA, E.

"Prostrata; articulis adscendentibus majusculis suborbiculatis; pulvillis remotis plerisque armatis; setis stramineis fulvisve parvis; aculeis 1-3 compressis fuscis apice pallidioribus, superioribus elongatis suberectis, cæteris deflexis; bacca ovata late umbilicata; seminibus majusculis angulatis hilo excisis. Llano Estacado, on the Upper Canadian River. A large, extensively spreading plant; the joints 6-7 inches long; spines 1½-2 or even 3 inches long. Fruit large, juicy. Seeds 2-3 lines in diameter, very irregular and deeply notched at the hilum.—E, Syn 293.

OPUNTIA ARBUSCULA E.

"Arborescens, erecta, capitato-ramosissima; articulis laete viridibus elongato-subtuberculatis; aculeis subsingulis porrectis vel subdeflexis; flore flavo-virescente. On the lower Gila, near Maricopa village: flowers June. A truly arborescent form, with a solid trunk of 4 or 5 inches in diameter, 7-8 feet high; joints 2-3 inches long, about 4 lines in diameter; tubercles indistinct, about 6 lines long; spine 9-12 lines long, often with 1 or 2 smaller ones under it. Flower 1½ inches in diameter."—E, Syn 309 (53).

**OPUNTIA BULBISPINA, E.**

"Radicibus fusiformibus; articulis parvis ovatis sæpe ex apice proliferis fragilibus; tuberculis ovatis brevibus; pulvillis parce setosis; aculeis teretiusculis scabrellis basi bulbosis, interioribus 4 cruciatis, inferiore longiore, exterioribus 8-12 radiantibus. Saltillo, Mexico. Spreading masses with joints an inch long or less; tubercles 4-6 lines long; interior spines 4-6, exterior ones  $1\frac{1}{2}$ -3 lines long. Apparently near the South American *O. pusilla*, Salm, and perhaps belonging to the *Opuntia glomerata* rather than here [*Clavata*]. Fruit unknown."—E. Syn 304.

**OPUNTIA ARENARIA E.**

"Adscendens; articulis obovatis compressis seu teretiusculis tuberculatis; foliis minutis; pulvillis subconfertis pallide setosis; aculeis 1-4 robustioribus albidis fascatisve, cum inferioribus brevioribus 2-6 albis; floribus sulphurei ovario obovato; petalis emarginatis; stigmatibus 5; bacca oblonga spinulosa; umbilico infundibuliformi; seminibus magnis irregularibus. Sandy bottoms of the Rio Grande near El Paso; flowers May. Spreading 2-3 ft.,  $\frac{1}{2}$ -1 ft. high; roots stout, creeping horizontally; joints  $1\frac{1}{2}$ -3 inches long, 1-2 inches wide, and  $\frac{1}{2}$ - $\frac{3}{4}$  thick, more strongly tuberculated than the allied species; leaves only a line long; pulvilli 3-5 lines apart, very bristly, especially on the old joints; upper spines 9-15 lines long. Flower 2-2 $\frac{1}{2}$  inches in diameter. Fruit about an inch long. Seeds 2 $\frac{1}{2}$ -3 lines in diameter. This is the only one of our Cactaceae on which the Cochenille has been found."—E, Syn 301 (45).

**OPUNTIA CHLOROTICA E-B.**

"Caule erecto aculeis flavis numerosissimis fasciculatis armato; articulis orbiculato-obovatis pallidis; pulvillis subremotis setas difformes confertas aculeosque 3-6 inæquales compressos stramineos gerentibus; floribus flavi ovario pulvillis confertis stipato; petalis spathulatis. Western Colorado country, between New Mexico and California, from the San Francisco mountains to Mojave creek. Plant 4-6 feet high, forming large and sometimes spreading bushes; the trunk covered with spines 1-2 inches long; joints 8-10 by 6-8 inches in length; spines  $\frac{1}{2}$ -1 $\frac{1}{2}$  inches long. Ovary with nearly 50 pulvilli, while the foregoing species [Engelmanni, etc.] have not more than 20."—E, Syn 291.

**OPUNTIA MACRORHIZA E.**

"Prostrata; articulis obovato-orbiculatis planiusculis; pulvillis setis fuscis et sæpe aculeis singulis binisve instructis; aculeis teretibus validis porrectis s. paulo deflexis basi apiceque fuscis ceterum albidis cum adventitio inferiore graciliore reflexo sæpe deficiente; floribus sulphureis basi intus rubellis; ovario sepalis subulatis deciduis 13 in axillis setulas fuscas brevissimas gerentibus stipato; sepalis interioribus 15-8 subulatis et (internis) ovatis acuminato-cuspidatis; petalis 8 sepalis superantibus late obovato-spathulatis obtusis cuspidatis erodenticulatis; stigmatibus 5 obtusis, adpressis, stamina numerosa æquantibus; bacca subpulposa clavata glabrata; seminibus marginatis.—

Naked, sterile, rocky places on the Upper Guadalupe. Flowers. (in St. Louis) in June. Root a large and fleshy tuber, sometimes 2 or 3 inches in diameter; joints 3-4 inches long, about  $2\frac{1}{2}$ - $3\frac{1}{2}$  wide, hardly attenuate at the base. Leaves subulate, about 5 lines long; areolæ  $\frac{3}{4}$ -1 inch distant, more crowded toward the base and on the edges; spines (often wanting) 1 inch long, the smaller 4-6 lines long. Flower 3 inches in diameter; ovary  $1\frac{1}{4}$  inch long; petals 1 inch wide,  $1\frac{1}{2}$  inch long, pale yellow, red at the base. Fruit  $1\frac{1}{2}$  inches long; the strongly margined seeds comparatively few,  $2\frac{1}{2}$  lines in diameter.—I have found the same plant in similar situations in Western Arkansas; and it is possible that it may be one of Nuttalls' new species (*O. mesacantha*, *O. cæspitosa*, or *O. humifusa*) of which I cannot find a description.—Nearly related to *O. vulgaris*.—Engelmann, *Plantæ Lindheimeriana*, 206.

OPUNTIA LINDHEIMERI E.

"*Erecta, robusta; caule lignoso; articulis (magnis) ellipticis basi attenuatis planis; pulvillis remotis ad margines confertioribus griseo-tomentosis, setis flavidis aculeisque paucis instructis 1-3 compressis validis deflexis varie divergentibus stramineis, nunc cum 1-2 aculeis adventitiis gracilioribus; flore . . . , bacca clavata elongata subpulposa glabrata; seminibus late marginatis.*—About New Braunfels. Plant erect, often 6-8 feet high; stems terete ligneous, sometimes six inches in diameter, with gray bark, and very light, spongy wood. Larger joints 9-12 inches long, 5-7 broad. Areolæ  $1\frac{1}{2}$ -2 inches distant on old joints; bristles on them 1-3 lines long. Spines all pale yellow, much compressed, indistinctly annulated,  $\frac{1}{2}$ -1 inch long, various; the 3 larger spines, or the  $\frac{1}{2}$  longer, with 1 or 2 shorter spines. The fruit which Lindheimer has sent as belonging to this species resembles very much that of *O. vulgaris*, 2- $2\frac{1}{2}$  inches long, slender, with a deep umbilicus, very different from that of the following species. Seeds 2- $2\frac{1}{2}$  lines in diameter, not numerous. Young plants grown from this seed have the same compressed spines, but are brown at the base; the lower areolæ produce no spines, but a quantity of long, coarse hair.—I add here the following species [*O. Engelmanni*], though not properly belonging to the flora of Texas, because I suspect that it is also found at the mouth of the Rio Grande, within the limits of Texas, and here, and especially on the barren sand islands at the Brazos, near Point Isabel, the St. Louis Volunteers found large and impenetrable thickets formed by an *Opuntia* with large joints, covered with almost globose fruits, with innumerable small seeds and a very luscious deep red pulp. The fruit and seed are before me, but unfortunately I did not obtain a living specimen."—Engelmann, *Plantæ Lindheimerianæ*, 207.

Coulter Contr U S na hb 3:420, 461.

*O. Engelmanni* in part fide E—but it seems unwise to discard the long established name.

**OPUNTIA LAEVIS** Coulter.

"Joints light green, elongate-obovate, 30 cm. long and 10 cm. wide, gradually narrowed below, obtusely pointed above: pulvini small, oval (3-4 mm. long), 2.5-3.5 cm. apart, gray-tomentose, with numerous short pale bristles, unarmed: flowers yellow, tinged with red, about 6 cm. broad; stigmas slender, 8: fruit somewhat pyriform, 5-6 cm. long, deeply umbilicate, bearing about 40 pulvilli; seed very irregular, 4-5 mm. in diameter, with thick acute undulate margin. Type, Pringle of 1881 (distributed as *O. angustata*) in Herb. Coulter. Arizona. Specimens examined: Arizona (Pringle of 1881; Palmer 93, 95; Coues & Palmer, 247; Vasey 247). Besides the spineless character, the seeds are about half as large as those of *O. angustata*, to which species it has been referred."—Coulter, *Cont. U. S. Na. hb.* 3:419.

**OPUNTIA DAVISII** E-B.

"Caulis dense lignoso ramosissimo divaricato; articulis junioribus erectis elongatis basi attenuatis; tuberculis oblongo-linearibus; aculeis interioribus 4-7 subtriangularibus rufis vagina straminea laxa indusiatis divergentibus; aculeis inferioribus 5-5 gracilibus; bacca ovata pulvillis sub-25 aculeigeris stipata. On the Llano Estacado, near the upper Canadian river; common. Spreading and somewhat procumbent, about 18 inches high; the only one in this section with dense wood. Joints 4-6 inches long, rather slender; tubercles 7-8 lines long. Interior spines 1-1½ inches in length; lower ones 3-6 lines long. Fruits (all sterile, and perhaps not properly developed) an inch or more in length."—E, *Syn.* 395 (49).

**OPUNTIA KLEINIÆ** DC.

"Erecta, ramosa, cinereo-viridis, ramis erectis cylindricis et tuberculatis, fasciculis ordine spirali sinistrorso dispositis, areola velutina, aculeis biformibus, aliis setosis innumeris ex albido rufis, uno maximo inferiore patenti-deflexo gracili albido. Mexico. Coulter, No. 21. Caulis digiti majoris crassitie, caulem *Cacaliæ Kleinæ* referens. Folia minima, oblonga, decidua. Aculeus major, pollicaris. Ad priorum sp. accedit [*O. decipiens*]."—DC. *Revue*, 118.

**OPUNTIA GRANDIFLORA** E:

"Subadscendens; articulis majusculis; pulvillis remotis; setis tenuissimis; aculeis subnullis; floris grandis ovario elongato; petalis sub-10 latissimis; stigmatibus 5; bacca elongata clavata. On the Brazos, Texas. Joints often 5-6 inches long; pulvilli nearly an inch apart. Flowers 4½-5 inches in diameter, red in the center; petals 2 inches long or more, and 1½ wide."—Eng. *Syn.* 295.

Considered by Eng. l. c. as "probably only a southern variety" of *O. rafinesquii*.

Foerst 523.

*OPUNTIA FILIPENDULA* E.

"Gluca; radicibus no. loso-incrassatis; articulis minoribus orbiculatis seu obovatis seu oblanceolatis tenuibus; pulvillis approximatis setas virescenti-flavas graciles numerosas gerentibus armatis vel inermibus; aculeis, si adsunt, 1-2 elongatis subangulatis cum-1-2 minoribus, omnibus albidis; floris purpurascens ovario gracili; stigmatibus 5; seminibus minoribus tumidis. Alluvial bottoms of the Rio Grande near El Paso, and eastward on the Pecos: flowers May and June. The long knotted roots, the small bluish joints, with the very small leaves and very long bristles, together with the purple flower, and thick very narrowly margined seeds, distinguish this species from all others. Plant 6-12 inches high; joints  $1\frac{1}{2}$ -3 inches long, 1-2 wide; pulvilli 4-6 lines apart; lower spines 1-2 inches long. Flower  $2\frac{1}{2}$  inches in diameter. Seed hardly 2 lines in diameter."—E. Syn. 294 (38).

*OPUNTIA EMORYI* E.

"Articulis cylindricis basi clavatis glaucis; tuberculis oblongo-linearibus elongatis; setis paucis; aculeis plurimis rufis, interioribus 5-9 validioribus triangulatis, compressis, exterioribus 10-20 pluriseriatis undique radiantibus; floribus flavis extus rubellis; bacca pulvillas 35-50 setosissimos inferiores aculeolatos gerentibus; seminibus valde inaequalibus irregularibus. Arid soil, from El Paso through Sonora to the desert of the Colorado: flowers August and September. The stoutest species of this section. Joints 4-6 inches long, curved,  $1-1\frac{1}{2}$  inches in diameter; tubercles  $1-1\frac{1}{2}$  inches long; longest spines  $1\frac{1}{2}$ - $2\frac{1}{2}$  inches long,  $\frac{3}{4}$ -1 line wide; the exterior spines gradually smaller, and less angular. Fruit 2- $2\frac{1}{2}$  inches long, partly armed with spines 4-8 lines long. Seeds from  $2\frac{1}{4}$ - $3\frac{1}{4}$  lines in diameter. Cotyledons oblique or accumbent."—E. Syn 303 (47).

*CEREUS ORCUTTII* Katharine Brandegee, Zoe 5:3 (13 Je 1900).

"Stems erect, branching, bright green, reaching a height of 3 m. and a diameter of 15 cm. with hard woody center; ribs 14-18, about 1 cm. high; areole round, about 6 mm. in diameter and about half that distance apart, densely covered with short, light gray wool; spines all slender, spreading, yellowish brown, irregularly 3-seriate; radials 12-20, about 12 mm. long, deficient above; intermediates about 10,  $\frac{1}{2}$  to more than twice longer, less spreading, one of the upper spines of this row usually stouter and darker, porrect, often reaching a length of 7 cm.; centrals about 5, porrect-spreading a little longer than the intermediates; flowers greenish brown, darker outside, diurnal, about 4 cm. entire length; petals short-apiculate; ovary densely covered with short scales, almost completely concealed by thick, rounded tufts of yellowish wool, in which are imbedded dark brown bristles 4-6 mm. long; stamens lining the upper half of the tube; style tips acute. fruit not known." Lower California.

## CACTACEAE.

Many people who have been acquainted only with the prickly pear and the cholla cactus of the plains—perhaps to the detriment of their epidermis, will be surprised to learn that over one thousand valid species exist, to which more than three thousand names have been applied by botanists and horticulturists.

The following is a nearly complete list of known species, and a few synonyms are also given. Descriptions of all will be published eventually we hope, but this contains much never published, at least in English, and in this form will be useful to many.

### Tribe ECHINOCACTEAE.

Calyx tube produced beyond the ovary; stem covered with elongated tubercles or ribs, rarely leafy (except when young).

Karl Schumann, in his monograph, rec-



ognizes 21 genera, including *Cereus*, *Pilocereus*, *Cephalocereus*, *Phyllocactus*, *Epiphyllum*, *Echinopsis*, *Echinocereus*, *Echinocactus*, *Meocactus*, and *Leuchtenbergia* in this tribe, in the order named, making a separate tribe for *Mammillaria*, *Pelecypora*, and *Ariocarpus*. *Pilocereus*, *Cephalocereus*, *Echinopsis*, and *Echinocereus* are better kept as sections of *Cereus*; *Epiphyllum* as a section of *Phyllocactus*; *Ariocarpus* (*Anhalonium*) as a section of *Mammillaria*. His other genera are divided into 3 tribes, *Rhipsalidaceae*, of 3 genera—*Pfeiffera*, *Hariota* and *Rhipsalis* (best treated as one); *Opuntieae*, of 3 genera—*Opuntia*, *Nopalaea* and *Pterocac-*

*tus* (the 2 latter of doubtful value); and *Peireskieae*, including *Peireskia* and *Maihuenia*.

### Genus ANHALONIUM Lemaire.

A. AREOLOSUM Lem.

A. ASELLIFORME Web.

A. elongatum S. is prismaticum.

A. fissipedum Monv. is sulcatum.

ANHALONIUM FISSURATUM E.

*Anhalonium Engelmanni* Lemaire Cact 42 (1868).

Living Rock, found in Texas and Mexico.

"Upper and exposed part of tubercle triangular in outline, convex, carinate and almost smooth below, convex and variously fissured and thereby verrucose above, sharp and crenate on the edges."—Engelmann.

A. furfuraceum Wat. is prismaticum.

A. jordanianum Reb. is *Echinocactus Williamsii*.

A. kotschoubeyanum Lem. is sulcatum.

A. Lewinii Hennings, is *Echinocactus Williamsii*.

A. PRISMATICUM Lem.

Simple, top flattened or depressed, more rarely hemispherical, center densely tomentose, 4-8 inches in diameter, 1-2 (rarely 4) inches above ground, the large root 4-6 inches below the surface with few coarse fibrous roots; tubercles triangular, acute with a cartilaginous tip, or obtuse, often ending in a minute depression or tomentose areola, spineless, the keel often with a strong shoulder, 1-3 inches long, often as wide, axis with long dense wool, upper surface smooth or often more or less roughened; flowers white to rose, 1 inch long, sepals brownish; fruits clavate, scarlet (how-see the Indians, or peyote (a name more commonly restricted to *Echinocactus Williamsii*). The minute areolae are sometimes placed on the upper surface of the tubercles near the end, or often absent. San Luis Potosi (Orcutt 2807), where numerous specimens exhibit all the variations necessary to connect several alleged species. The type of Watson's *Mammillaria furfuracea* was collected at Carneros Pass, Coahuilla (Pringle 2580).

A. puivilligerum Lem. is prismaticum.

A. retusum S. is prismaticum.

ANHALONIUM RUNGEI Hildm.

Sandy loam, in the foot of high mountains, Coahuilla (C. Runge).

A. SULCATUM S.

A. TRIGONUM Web.

A. turbiniforme Web.

A. williamsii F. is *Echinocactus Williamsii* Lem.

Genus APOROCACTUS Lemaire.

A. Baumannii Lem. is *Cereus Baumannii* Lem fide KS.

A. constrictus Lem. is *Cereus Baumannii* fide KS.

A. flagelliformis Lem. is *Cereus flagelliformis* Mill fide KS.



**Genus ARIOCARPUS Scheidw.**

Karl Schumann revives this name in his publications, but we prefer to retain the name *Anhalonium*, which has been in universal use, among botanists and horticulturists alike, for more than fifty years.

- A. *aselliformis* Web, is *Anhalonium aselliforme*  
 A. *fissuratus* KS, is *Anhalonium fissuratum*.  
 A. *Kotschubeyanus* KS, is *Anhalonium sulcatum*.  
 A. *retusius* Scheidw, is *Anhalonium prismaticum* Lem.  
 A. *sulcatus* KS, is *Anhalonium sulcatum*.  
 A. *trigonum* KS, is *Anhalonium trigonum*.  
 A. *Willdamsii* Voss, is *Echinocactus Willamsii*.

**Genus ASTROPHYTUM Lemaire.**

- A. *asterias* Lem Cact 50, based on *Echinocactus asterias*.  
 A. *capricorne* Hort, based on *Echinocactus capricornis*.

**ASTROPHYTUM MYRIOSTIGMA Lem.**

The Bishop's Hood; an odd and beautiful spineless plant from Mexico, resembling a piece of carved stone.

- A. *prismaticum* Lem. Cact 50, error for *myriostigma*.

**CACTUS ALTERNATUS Coulter.**

"Subglobose, 10 cm. in diameter, simple; tubercles long (15-20 mm) and spreading, with woolly axils: radial spines 3, rigid and recurved, 5 mm long; central spines 3, very stout and much recurved, 20-30 mm long, alternating with the radials; all ashy colored and often twisted; flower and fruit unknown: Type, in Herb. Coulter, San Luis Potosi (Eschauzier of 1891)."—Coulter Cont U S Nat Hb 3:95

**CACTUS BRUNNEUS Coulter.**

"Obovate-cylindrical, 3 by 6 cm, simple, tubercles ovate, grooved to the base, 5-6 mm long, with woolly axils; radial spines 11-15, spreading, rather rigid and brown-

ish (lighter with age), 8-10 mm long; central spine much larger, 20 mm long, hooked; flower and fruit unknown. Type in Herb. Coulter. San Luis Potosi (Eschauzier of 1891)."—Coulter Cont U S Nat Hb 3:117.

**CACTUS DENSISPINUS Coulter.**

"Globose, 7.5 cm in diameter, simple; tubercles short, with woolly axils; radial spines about 25, erect-spreading, slender, but rigid, yellow (brownish to black with age), unequal, 8-10 mm long; central spines 6, a little longer (10-12 mm) and straight, more rigid and darker, black tipped; seeds obovate, reddish-brown, 1 mm long. Type in Herb. Coulter. San Luis Potosi (Eschauzier of 1891). Very easily distinguished by its dense, erect spines, which so completely cover the plant as to give it the appearance of a large chestnut burr."—Coulter Cont U S Nat Hb 3:96-97.

*Mammillaria castanoides*, M. Wegneri, M. *densispina*, and M. *fusca*, are probably all identical with this species.

**CACTUS ESCHAUZIERI Coulter.**

"Depressed-globose, 3 cm in diameter, simple; tubercles broader at base, 6-8 mm long, with naked axils; spines all pubescent; radials 15-20, with dusky tips, the lateral 10-12 mm long, the lower weaker, shorter and curved, the upper shorter, solitary central spine reddish, slender, somewhat twisted, usually hooked upwards, 15-20 mm long; flowers red (?); fruit reddish (?), ovate, about 10 mm long; seeds reddish, oblique-obovate, 1.2 mm long, pitted, with subventral hilum. Type in Herb. Coulter. San Luis Potosi (Eschauzier of 1891)."—Coulter Cont U S Nat Hb 3:104.

**CACTUS MACULATUS Coulter.**

cm., simple: t

"Obovate-cylindrical, 6 by 8 cm, somewhat cespitose; tubercles ovate, terete, 10 mm long, grooved to the base, with naked axils; radial spines 10 or 11, straight and spreading, rigid, blackish (becoming ashy with age), black-tipped, 12 mm long; central spine large, more or less spotted, erect, 25-35 mm long; flower 13 mm long, pinkish; fruit unknown. Type in Herb. Coulter, San Luis Potosi (Eschauzier of 1891)."—Coulter Cont U S Nat Hb 3:117.

**CACTUS PRINGLEI Coulter.**

"Globose (?), 5 cm in diameter; tubercles short-conical, about 6 mm long, with very woolly axils; radial spines 18-20, setaceous-bristly and radiant, 5-8 mm long, central spines 5-7 (usually 6), stout and horny, more or less recurved, spreading 20-25 mm long; all straw-colored, but the centrals darker; flowers deep red (darker, even brownish outside), 8-10 mm long; fruit unknown. Type, Pringle of 1891 in Herb. Gray."—Coulter, Cont U S Nat Hb 3:109.

**Genus CEPHALOCERUS Pfeiffer.****C. CHRYSOMALLUS KS.**

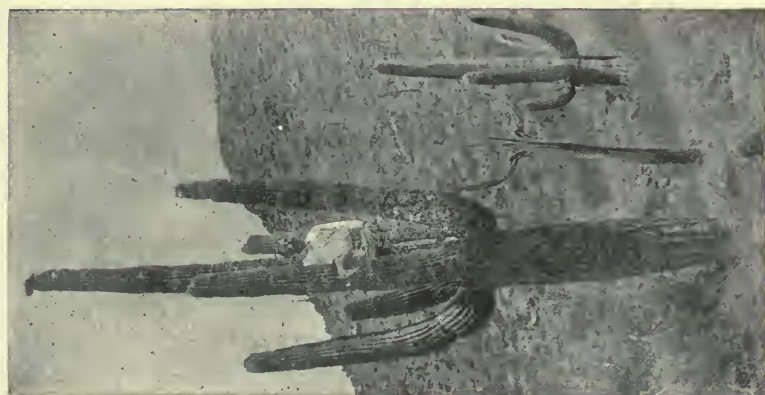
Erect, branching like a candelabra, 10-15 feet high, stems 3-6 inches in diameter;





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**CEREUS TRIANGULARIS** Miller.



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**CEREUS GIGANTEUS** Engelm.



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*ECHINOCACTUS GRUSONII* Hilg.



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*CEREUS MARGINATUS* DC.

young plants with 17 obtuse ribs and deep intervals, 12-13 ribs in older plants and more obtuse, areolae  $\frac{1}{2}$  inch apart; 10-12 radial spines, slender, straw-colored, centrals 4-5, the lower one the longest, the upper portion of the older or floriferous stems supplied with numerous ciliary white spines, especially abundant on the side where the flowers are produced; flower 2 inches across, 3 inches long (including the ovary); about 25 long narrow scales on ovary with 6-12 fine white hairs  $\frac{1}{2}$ -1 inch long in the axis, ovary apple green; petals about 10.8-10 mm broad, nearly 20 long, acute, white; sepals equally numerous, brownish white; style  $2\frac{1}{2}$  inches long, whitish, nearly equalling the petals; filaments white, anthers an eighth inch long and pale yellow. Flower deeply embedded in a mass of persistent hairs an inch long and of a snowy white—tinged with yellow occasionally at the tips. Fruit nearly globose,  $1\frac{1}{2}$  inches long, dull purple with a bluish bloom; remains of flower persistent; the minute scales and hairs abundant or nearly absent; outer skin  $\frac{1}{4}$  inch thick, dull purple, the edible pulp bright magenta, rather insipid, sweetish, seeds black. Vieja, or Old Woman cactus of the Mexicans. States of Puebla and Oaxaca, Mexico (Orcutt 2679, 2679).

**C. COLUMNA-TRAJANI** KS.

Erect, 15-20 feet high, 2-3 short branches slightly divergent from the main stem a few feet from the ground: 5-7 radial spines; one-fourth to three-fourths inch long, 1 central  $\frac{1}{2}$ -2 inches long, rarely a shorter central or radial above; radials laterally disposed except the lowest, all ashy black. Ribs 11-13 in young plants, obtuse with shallow intervals. Te-te-cho of the Mexicans, who describe the fruit as sweet and edible, the flower as red. States of Puebla and Oaxaca, Mexico (Orcutt 2706).

**C. Hoppenstedtii** KS, is *Phiocerus* Hoppenstedtii Web fide KS.

**C. MACROCEPHALUS** Web.

**C. MELOCACTUS** KS.

**C. SENILIS** Pf.

**Genus CEREUS** Haworth.

"Flowers about as long as wide or elongated. Scales of the ovary distinct, with naked or woolly axils, or almost obsolete and the axils spiny. Berry succulent, covered with spines or scales or almost naked. Seeds black, without albumen. Embryo short and straight or curved or hooked; cotyledons usually contrary to the sides of the seed.—Plants of all sizes, low or climbing or erect, sometimes enormous; spine-bearing areolae on vertical ribs. Flowers from the older or, at least, fully formed parts of the plant, not from any preformed areola, but bursting through the epidermis just above the bunches of spines; some open only in sunlight, others only at night, others again are not thus influenced. Fruit often edible, sometimes of very large size."—E.

Subgenus **EUCEREUS**. "Prismatic or cylindrical, mostly branching; flowers usually longer than wide; stigmas whitish; seeds obovate, usually smooth or pitted;

embryo with foliaceous curved cotyledons."—E.



**CEREUS COLUBRINUS** Otto.

**CEREUS ACULEATUS** Otto.

**CEREUS ALAMOSENSIS** Coulter.

*Sina spinosa* of Sonora; 2-8 feet high, 2-10 branches from the base with joints 1-4 feet long, flexuous or decumbent, often forming arches and rooting at the joints, and thus spreading over wide areas, sometimes 100 feet in diameter or more; ribs about 7, slightly tuberculated. The bright



red flowers slightly resemble those of *C. flagelliformis*.

*CEREUS AMBLYOGONUS* G. Don.

*CEREUS AMECAENSIS* Heese.

*CEREUS ANDALGALENSIS* Web.

*CEREUS AREOLATUS* Mueh.

Andes, South America.

*CEREUS ARMATUS* Otto.

*CEREUS ASSURGENS* Gris.

West Indies.

*CEREUS AUREUS* KS.

*CEREUS AZUREUS* Parm.

*CEREUS BARBATUS* Otto.

*CEREUS BAUMANNII* Lem.

Paraguay Republic, South America.

Variety *COLUBRINA* KS.

Variety *FLAVISPINA* KS.

Variety *SMARAGDFLORA* Web.

*CEREUS BAXANIENSIS* Karw.

Mexico.

*CEREUS BENECKII* Eh.

Arborescent and branching after the habit of *Cereus geometrizans*, 6-7 ribbed; areolae  $\frac{1}{4}$  inch apart, woolly, bearing 8 radial spines  $\frac{1}{2}$  inch or less long, and 1 central 1-3 inches long, curved upward, all ash colored; fruit globose,  $\frac{1}{2}$  inch in diameter, dull purple; remains of flower usually deciduous leaving a large ash-colored scar; seeds large, 3-8) in each berry. The be-ta-zo-vo of the Indians. In aspect of plant and fruit this closely resembles the garambul'o (*Cereus geometrizans*). Near Oaxaca, Mexico (Orcutt 270).

*CEREUS BERTINII* L'Her.

Paraguay Republic, South America.

*CEREUS BLANKII* Pos.

*CEREUS BOECKMANNII* Otto.

West Indies.

*CEREUS BONARIENSIS* Sw.

*CEREUS BONPLANDII* Parm.

Paraguay Republic, South America.

*CEREUS BRACHIATUS* Gal.

Tehuacan, Puebla, Mexico.

*Cereus bradtianus* C. is *Opuntia cereiformis* Web fide KS.

*CEREUS BRANDII* H Angl.

*CEREUS BRIDGESII* S.

Bolivia, South America.

*CEREUS CAESIUS* Otto.

*CEREUS CANDELARIUS* Hort.

*CEREUS CANDICANS* Gill.

Argentine Republic.

*CEREUS CAVENDISHII* Monv.

*CEREUS CHALYBAEUS* Otto.

Argentine Republic.

*CEREUS CHILENSIS* Colla.

Chile, South America.

*CEREUS CHIOTILLA* Web.

Arborescent, 20 feet high, branching freely a foot or so above the ground, the older branches 6 inches in diameter, the tips of the branches  $2\frac{1}{2}$  inches in diameter with densely woolly ovate or shield-shaped areolae, bearing the terminal



*CEREUS DASYACANTHUS* Engelm.

flowers and fruit. The tree often of an umbrella shape, or the interlocking branches curving or twisting in any other than a symmetrical manner. Ribs 6-8, acute, with sharp intervals; areolae  $\frac{1}{4}$  inch across,  $\frac{1}{2}$  inch long, nearly or quite contiguous; 1 stout, terete, ashy, central spine  $\frac{1}{4}$ -2 inches long or less—often 2 or 3 short centrals above  $\frac{1}{4}$  inch long, erect; radials about 12,  $\frac{1}{4}$  inch long, curved inward, all but the lowest laterally disposed, spines all nearly white when young. Called 'tiotilla' by the Indians, who gather quantities of the fruit for the markets of Tehuacan in June for 1 cent. Fruit  $1\frac{1}{4}$  inch diameter, slightly longer, remains of the flower persistent; color dull dark red, with 25-30 thin semi-transparent triangular scales—the base and sides equal—about three-eighths of an inch; pulp dark purple, with numerous black seeds. State of Oaxaca, Mexico (Orcutt 2648, 2666). Flower  $1\frac{1}{2}$  inches across, bright lemon yellow (27 Je 1902).

*CEREUS CLAVIFORMIS* R-K.

*CEREUS COERULESCENS* S.

Argentine Republic.

*CEREUS COLUBRINUS* Otto.

An erect-growing Cuban plant, night-blooming, the fragrant white flowers 6 inches across.

*CEREUS COLUMNARIS* Lodd.

*CEREUS COMETES* Scheidt.

*CEREUS CONCINNUS* Hge.



*CEREUS ENNEACANTHUS* Engelm.

*CEREUS COQUIMBANUS* KS.  
Chile, South America.

*CEREUS CORYNE* Otto.  
Argentine Republic.

*CEREUS COSSIRENSIS* Tineo.

*CEREUS CRENATUS* Lab.

*Cereus* Cumengel Web, is gummosus.

*CEREUS CURVISPINUS* Bert.

*CEREUS DAMARCARO* Hge.

*CEREUS DECORUS* Lodd.

*CEREUS DONKELAERI* S.

*CEREUS DUMORTIERI* S.  
Mexico.

*CEREUS DUSSII* KS.

Guadeloupe Island, West Indies.

*CEREUS EBURNEUS* S.

Jalapa, Vera Cruz, Mexico.

*CEREUS EMORYI* E.

San Diego's Velvet Cactus. This is one of the best-known of California cacti, the slender, thickly-set yellowish spines giving it a peculiarly beautiful appearance. The spines on the young joints are shorter, soft and flexuous; the flowers are yellowish, followed by a small edible fruit.

*CEREUS ERUCA* Brandegee.

"Prostrate, very rarely branched, 13-ribbed, 3-4 feet long, 3-4 inches in diameter; rooting from the under side of the older growth, decaying at one end and growing forward at the other, generally in patches of 20-30, probably originating from a common center; areolae 4-6 mm in diameter, separated about the same distance; spines about 20, stout, ash-colored, less than an inch long, the exterior cylindrical, the interior stouter, angular, somewhat and the lower central one much flat-

tened, more than an inch long, angular, strongly reflexed. Common on the sand of Magdalena island and about San Jorge, Baja California. Its local name is 'chitenoa.' The manner of growth, with up-lifted heads and prominent reflexed spines, gives the plants a resemblance to huge caterpillars."—Brandegee, Cal ac pr sr 2, 2:163, t 7.

*CEREUS EUCHLORUS* Web.  
Brazil, South America.

*CEREUS EUPHORBIODES* Haw.  
Brazil, South America.

*CEREUS EXTENSUS* S.

*CEREUS FASCICULARIS* Meyen.  
Peru, South America.

*CEREUS FLAGELLIFORMIS* Haworth.  
The well-known whp-cord or Rat's-tall Cactus, so useful in hanging baskets or for grafting on columnar species; the bright rose-colored flowers are extremely attractive.

Variety *LEPTOPHIS* KS.

*CEREUS FORBESII* Otto.  
Argentine Republic.

*CEREUS FUNKII* KS.

*CEREUS GEMMATUS*

*CEREUS GHIESBREGHTII* KS.  
Mexico.

*CEREUS GLAUDESCENS* Tweed.

*CEREUS GLAZIOVII* KS.  
Brazil, South America.

*CEREUS GLYCIMORPHUS* Orcutt.  
Echinocereus glycimorphous Foerst.

*CEREUS GRANDIFLORUS* Haworth.

Miller, Gard Dictionary, ed, n 11. "The night-flowering cereus has gained a fame which entitles it to prominent notice, and plants might well be included in every garden, for its flowering is a source of interest to the least observant persons."—Castle.

*CEREUS GRANDIS* Haw.

*CEREUS GREGGII* Engelm.

Gregg's night blooming cactus occurs in the arid regions of Southern Arizona, New Mexico, Texas, Chihuahua and Sonora, and is notable for its large tuberous root and slender inconspicuous stems, 1 to 3 or 4 feet high, a half inch in diameter. Flower 6 inches long, 2 inches in diameter, with pale, purple petals, followed by the smooth, oval, acuminate, scarlet fruit, succulent, crowned with the remains of the corolla, and supported by a distinct stipe of a bright crimson.

*CEREUS GUMMOSUS* Engelm.

The pitahaya agria, or cord-wood cactus, of Lower California, is noted for its large, bright, scarlet fruit, possessing a delicious flavor, pleasantly



acid, like a strawberry, the pulp the color of a ripe watermelon, with the small black seeds scattered throughout. The flowers are 4 to 5 inches long, purple, and quite handsome. The stems are 4 to 10 feet high, 3 to 5 inches in diameter, armed with stout angular, blackish spines.

*CEREUS HAAGEANUS* S.

*CEREUS HAMATUS* Scheidw.  
Near Orizaba, Mexico.

*CEREUS HANKEANUS* Web.

*CEREUS HETERACANTHUS* Tweed.

*CEREUS HILDMANNIANUS* KS.  
State of Rio de Janeiro, Brazil.

*CEREUS HIRSCHTIANUS* KS.

*CEREUS HOLLIANUS* Weber.

"Climbing from base, 4.5 m high and stout, dark-green; ribs 10-12, acute, often oblique, with areolae 2-3 cm apart; radial spines about 12, irregular, 1-1.5 cm long; centrals 3, the lower one 5-10 cm long and deflexed; flowers near the summit, white; 10 cm long; fruit as large as a goose egg, dark purplish-red, bearing wool and spines. Type Weber specimens in hb. Mo bot gard. Common about Tehuacan, Puebla. Important for its wood, which forms long, straight rods used for poles in hedges and vineyards."—Coulter, Cont Na hb 3:41.

*CEREUS HORIZONTALIS* GRI.

*CEREUS HUASCHA* Web.  
Argentine Republic.

*CEREUS HYLACANTHUS* KS.  
Argentine Republic.

*CEREUS HYPAGAEUS* Web.

*CEREUS INERMIS* P DC.  
Near La Guayra, Venezuela.

*CEREUS INVERSUS* Otto.

*CEREUS IRRADIANS* Lem.

*CEREUS ISOGONUS* KS.  
Andes, South America.

*CEREUS JACQUINII* Rebut.

*CEREUS JAMACARU* P DC.  
Brazil, South America.

*CEREUS JUSBERTII* Rebut.

*CEREUS KARSTENII* S.

*CEREUS KARWINSKII* Hge.

*CEREUS KERBII* KS.  
Colima, Mexico.

*CEREUS LAMPROCHLORUS* Lem.  
Argentine Republic.

*CEREUS LANCEANUS* Hort.

*CEREUS LANICEPS* KS.  
Bolivia, South America.

*CEREUS LEMAIREI* Hook.  
West Indies.

*CEREUS LEPIDOTUS* S.  
Near La Guayra, Venezuela.

*CEREUS LEPTACANTHUS* S.

*CEREUS LINDBERGIANUS* Web.  
Paraguay Republic, South America.

*CEREUS LINDMANNII* Web.  
Paraguay Republic, South America.



*CEREUS PECTINATUS* Engelm.

*CEREUS LINKII* Hort.

*CEREUS LONGIFOLIUS* Karw.

*CEREUS LORMATUS* Griseb.

*CEREUS MACDONALDIAE* Hook.

*CEREUS MACROGONUS* S.

State of Rio de Janeiro, Brazil.

*CEREUS MALLETTIANUS* Cels.

*CEREUS MALLISONI* Hort.

*CEREUS MARTIANUS* Zucc.

*CEREUS MARTINII* Lab.

*CEREUS MAYNARDII* Paxt.

*CEREUS MELANURUS* KS.

Brazil, South America.

*CEREUS MICRACANTHUS* P DC.

*CEREUS MONVILLEANUS* Web.

*CEREUS MULTANGULARIS* Haw.

Andes, South America, probably Peru.

*CEREUS MULTIPLEX* Hort.

*CEREUS NAPOLEONIS* R. Graham.

West Indies.  
*Cereus Nickelsi* Hort, is *Cephalocereus columna-trajani*.

*CEREUS NYCTICALUS* Link.

*CEREUS OBTUSANGULUS* KS.

State of Rio de Janeiro, Brazil.

*CEREUS OCAMPONIS* S.

Climbing over trees, fences or houses; joints 3- to commonly 4-sided, 1 or 2 to 8 feet long, young growth even 6-ribbed; areolae 1-1½ inches apart, tomentose, commonly 7 radial and 1 central spines; radials rarely over 1 mm, central rarely 6 mm long, stout, straight or slightly curved.



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CERFUS GEOMETRIZANS Mart.



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CEREUS SARGENTIANUS Orcutt.



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CEREUS SENILIS Salm-Dyck.



Stems dark green, 3 inches thick, the ribs scarcely an eighth inch thick, strongly serrulate, bearing the areolæ at the summit. Flower white, style 7 inches long; stigmata 14, slender, white, nearly  $\frac{1}{2}$  inch long; ovary globose, an inch in diameter, covered with about 4 tubercles; surmounted with minute scales (the tomentose axils commonly bearing 2 white spines); tube of corolla 5 inches long, bearing 5 or more similar scales with tomentose and spiny axils; filaments and large anthers apparently white (1 dried flower), petals narrow, acuminate,  $1\frac{1}{2}$  inches long, extending three-fourths inch beyond the filaments. Nopale, or Nopalita de Cruz, of the Indians; 15-20 feet high; cultivated in gardens for its fruit (?). States of Puebla and Oaxaca, Mexico (Orcutt 2709).

*CEREUS PAPILLOSUS* A. Lke.

*CEREUS PARVIFLORUS* KS.

Bolivia, South America.

*CEREUS PARVISETUS* Otto.

*CEREUS PASACANA* Web.

Argentine Republic.

*CEREUS PAUCISPINUS* E.

*CEREUS PAXTONIANUS* Monv.

*CEREUS PERUVIANUS* Mill.

Peru, South America.

Variety *MONSTRUOSA* P DC.

*CEREUS PITAHAYA* P DC.

Brazil, South America.

*CEREUS PLATYGONUS* Otto.

*CEREUS POLYRHIZUS* Web.

*CEREUS POMANENSIS* Web.

Argentine Republic.

*CEREUS PTEROGONUS* Lem.

*CEREUS PULCHELLUS* Pf.

*CEREUS QUADRICOSTATUS* Bello.

West Indies.

*CEREUS QUERETARENSIS* Weber.

"Tree-like, much branched, 6-8 m high; flowers 10-12 cm long; ovary covered with triangular fleshy scales which arise from a tubercle and bear axillary wool and spines; fruit densely covered with bunches of dark-yellowish or brownish spines bulbous at base. Type, Weber specimens in hb Mo bot gard. In the vicinity of Queretaro, Mexico, and cultivated along roadsides and fence rows."—Coulter, Cont Na hb 3:410.

*CEREUS REPANDUS* Haw.

*CEREUS RIGIDISPINUS* Monv.

Probably from the Andes (not Mexico, fide KS).

*CEREUS RUFERI* Hge.

*CEREUS RUSSELLIANUS* Forb.

*CEREUS SALM-DYCKIANUS* Web.

*CEREUS SAXICOLA* Morong.

*CEREUS SCHOMBURGKII* Otto.

*CEREUS SEPIUM* P DC.

*CEREUS SERPENTINUS* P DC.

Mexico.

*CEREUS SETACEUS* S.

Brazil, South America.

*Cereus simonii* Hilldm., is *C. alamosensis* C.



OLD MAN CACTUS.

*Cereus sorocensis* Runge, is *C. alamosensis* C.

*CEREUS SPACHIANUS* Lem.

Argentine Republic.

*CEREUS SPECIOSISSIMUS* DC.

*CEREUS SPECIOSUS* KS.

Variety *COCCINEA* KS.

*CEREUS SPINULOSUS* P DC.

Mexico.

*CEREUS SPLENDIDUS* Paxt.

*CEREUS STELLATUS* Pf.

*CEREUS STELLIGER* Otto.

*CEREUS STOLONIFER* Web.

*CEREUS STRIATUS* Brandegee.

*Cereus digueti* Weber, Mu d'hist nat, b, 1895, 319.

Apparently not rare in saline soil near Batamotal, Sonora, where it is known by the name sa-ra-ma-tra-ca; the tubers are produced abundantly like small potatoes.

*CEREUS STRIGOSUS* Gill.

Argentine Republic.

*CEREUS SUBFLAVISPINUS* Otto.

*CEREUS SUBINERMIS* Hem.

*CEREUS SUBINTORTUS* Otto.

*CEREUS TENUISSIMUS* G. Don.

*CEREUS TEPHRACANTHUS* Lab.

Bolivia, South America.

*CEREUS TETAZO* Weber.

"Stout, branching, 10-15 m high; flowers greenish-white, 6 cm long, in clusters of 10-20 from the youngest areolae and without any wool; fruit irregularly dehiscent, exposing the ripe pulp. Type, Weber specimens in hb Mo bot gard. Zapatalan, Jalisco."—Coulter, Cont Na hb 3:409.

*CEREUS TETRAGONUS* Haw.

*CEREUS TORTUOSUS* Forb.

Argentine Republic.

## CEREUS TRIGONUS Haw.

West Indies.

## CEREUS TRINITATENSIS Lem.

## CEREUS TUBEROSUS Pos.

## CEREUS UNDULATUS H. Dresd.

## CEREUS VERSCHAFFELTII Hge.

## CEREUS VIRENS P DC.

Subgenus LEPIDOCEREUS E. Tall cylindrical branching plants with the floriferous and sterile areolae bearing similar spines; flower tube short, stigmas white, embryo curved.

## Cereus batusus Web.

Erect, rarely branching, 8-12 or more stems from the same root, 10 or more feet high, 4 inches in diameter; ribs 9, slightly obtuse with sharply defined intervals; areolae an inch apart on the older stems; radial spines 15,  $\frac{1}{4}$ - $\frac{1}{2}$  inch long, the lower ones the longer, on the older growths a stout and about  $\frac{1}{2}$  inch long; central spines 4-6, the upper one-eighth inch long or more, the lowest often 3 inches long, reflexed, twisted, flattened or carinate. Flower 2 inches across, including the ovary, 4 inches long; petals white, obtuse,  $\frac{1}{2}$  inches long, the 16 stamata, style and anthers pale yellow, filaments white; style 2 inches long. Fruit said to be red, 4 inches long, with black seeds; immature fruit with about 120 woolly areolae with capillary spines in the axils of obsolete scales or tubercles. State of Puebla, Mexico (Orcutt 2635). Called 'cardon' by the Indians, perhaps erroneously.

## CEREUS CANDELABRUM Web.

Aborescent, 25 feet high, trunk 1-2 feet in diameter, branches freely 3-5 feet from the ground, producing often 50 erect growing stems in candelabra form shading an area greater in diameter than the height of the tree. Branches a foot in diameter, 9-10 obtuse ribs with areolae  $1\frac{1}{2}$  inch apart, when young, and densely tomentose at the base of spines; the older areolae but slightly tomentose, the bases of the spines often in close contact; spines ashy, bulbous at base, flattened or angular, strong; the central 2 inches long 7-9 radials, usually 3 laterally disposed on each side and one below the central, and more rarely 1-2 shorter radials above; spines mostly deciduous on the trunk and older branches, the persistent areolae often enormously enlarged to a height and diameter of 1-2 inches with 10-20 formidable subulate spines, the longest 3 inches or more long. Flower white, much resembling that of *C. Pringlei*; fruit ripens in the middle of May, dull red, 3 inches long, 2 and  $\frac{1}{2}$  in greater and lesser diameter, pulp purplish, sweet, edible, but valued less than the pitilla and other cactus fruits. About 30 triangular scales, bearing in the axils densely woolly areolae with 35 or more slender, bristly, straight, white spines  $\frac{1}{4}$ - $\frac{1}{2}$  inch long, form the armament of the fruit—the spiny areolae easily detached (or deciduous?) at maturity. Fruit said to be used in making a pleasant drink and the seeds also utilized. The erect growth of the numerous branches and the bright glaucous color renders this giant cactus everywhere conspicuous. State of Oax-

aca, Mexico (Orcutt 2675). Known to the Indians as the 'cardon'.

## CEREUS ORCUTTII K Br.

Stems erect, branching, bright green, reaching a height of 3 m and a diameter of 15 cm, with hard woody center; ribs 11-18, about 1 cm high; areolae round, about 6 mm in diameter and about half that distance apart, densely covered with short, light gray wool; spines all slender, spreading, yellowish brown, irregularly 3-seriate; radials 12-20, about 12 mm long, efficient above; intermediates about 10, one-third to more than twice longer, less spreading, one of the upper spines of this row usually stouter and darker, porrect, often reaching a length of 7 cm; centrals about 5, porrect-spreading a little longer than the intermediates; lowers greenish brown, darker outside, diurnal, about 4 cm entire length; petals short apiculate; ovary densely covered with short scales, almost completely concealed by thick, rounded tufts of yellowish wool, in which are embedded dark brown bristles 4-6 mm long; stamens lining the upper half of the tube; style tips acute; fruit not known.—Katharine Brandegee, Zoe, 5:3 (Je 1909).

Near Rosario, Baja California. Densely covered with bright yellowish brown spines; fruit the size of an orange; called pitilla dulce.

## CEREUS PRINGLEI S. Watson.

The Cardon is the giant cactus of Lower California and Sonora, where it forms forests, attaining a height of 20 to 35 feet. The ribs are usually 13, and it differs from the giant cactus of Arizona (*Cereus giganteus*) in that the spine bearing areolae on the ribs are connected by woolly grooves. The trunk is often 3 to 4 feet in diameter; the older portions of the branches usually quite thornless. The dead wood is used for fuel, but otherwise this mammoth production of the desert seems to be without use.

## CEREUS THURBERI Engelm.

The Pitahaya Dulce is an abundant species in Sonora and portions of Lower California, also said to occur in southern Arizona. It grows from 5 to 20 feet high, many stems 6 to 10 inches in diameter from the same base, bearing greenish or reddish white white flowers followed by large luscious fruit, rather too sweet it is said for northern palates. It was named in honor of George Thurber, a widely renowned botanist.

Subgenus PILOCEREUS E. "Tall, cylindrical, mostly unbranched; upper flower-bearing portion with more crowded areolae and longer, denser, thinner bristles or hairy spines; flowers short; seeds as in *Eucereus*."—E.



**PILOCEREUS ALBISPINUS** Rumpl.  
 Foerster, handb cact, ed 2, 649.  
 KS nat pflzf III (6a) 180; Mon 187.  
 Cereus albispinus S obs bot 5 (1822); HD ed 2,  
 45, Pf en 85. Foerster 385, Lab 341.  
 Cereus crenulatus S HD ed 2, 45. Pf en 85 F  
 382. S obs bot 6 (1822).  
 Cereus crenatus Lab 341.  
 Cereus octagonus et decagonus Hort, Pf en 85.  
 Cereus acromelas Otto Ind cact hort Berol 1833  
 fide Pf en 84 Curacao.

Variety **CRENATUS** Hort  
**PILOCEREUS COERULESCENS** Lem.

Pilocereus andryanus Cels  
 Cereus aethiops Haw phil mag 1830, 109.  
 Cereus mendory Hort fide Pf en 85.  
 Cereus coerulescens S HD 335. Pf en 85.  
 Pilocereus glaucescens Lab in part.  
**PILOCEREUS CELSIANUS** Lem.  
 Lem cat Cels; Rev hortie 1862, 428.  
 Salm-Dyck cact HD ed 2, 43, 185  
 Foerster handb cact ed 2, 653  
 Labouret Monograph 276.  
 K Schumann nat pflzf III (6a) 186; Mon 179.  
 Pilocereus fossulatus Lab rev hort iv sr 4, 25  
 (1855). Lem rev hort 1862, 418. F 660.  
 Croucher Gard chron 1873, 983 f.  
 Pilocereus foveolatus Lab cat Cels 1858, non  
 Lemaire.

Pilocereus Williamsii Lem rev hort, 1862, 428.  
 Pilocereus Bruennowii et Kanglerl Haage Jr  
 ex Foerster handb cact ed 2, 651, 671.

Variety **LANCEOLATUS** Salm  
**BRUENNOWII** Karl Schumann.  
**GRACHLOR** KS.  
**WILLIAMSI** KS All Bolivia.

**PILOCEREUS CHRYSACANTHUS** Web.  
 Teahuacan, Puebla, Mexico.  
 Pilocereus chrysomallus Lem, is Cephalo-  
 cereus chrysomallus de KS.  
 Pilocereus columna-trianii F, is Cephalo-  
 cereus columna-trianii fide KS.

**PILOCEREUS COMETES** Mittl.  
 Foerster handb cact ed 2, 357.  
 KS nat pflzf III (6a) 180; Mon 190.  
 Cereus cometes Schied AGZ 8:339.  
 Pilocereus jubatus S 1842, 24; cd 2, 40, 183.  
 Foerster 356; ed 2, 6 1. Lab 28  
 Lem rev hort 1862, 427.  
 Cereus flavicomus Sed 2, 46, 202. F 387.  
 Labouret, Monogr 347 (1853).  
 Pilocereus flavicomus Rumpl, F ed 2, 657.  
 Pilocereus auratus Lab Gruson cat.  
 "San Louis Potosi."

**PILOCEREUS DANTWITZII** Hge.  
 Haage, Gard chron 1873 17 f 1.  
 Van Houtte in Flore des Serr 13:33 t 2163.  
 Foerster handb cact ed 2, 657 f.  
 KS nat pflzf III (6a) 180; Mon 194.  
 Seitz?

?Cactus lanatus HBK nov gen et sp 6:68  
 ?Cereus lanatus DC prodr 3:464.  
 Pilocereus haagei Poselger ms. Peru  
**PILOCEREUS DIVARICATUS** Lem.  
**PILOCEREUS ERYTHROCEPHALUS**  
 KS.  
 KS Mon 195. Argentine Republic.  
**PILOCEREUS EXERENS** KS.  
 KS nat pflzf III (6a) 181; MfK 4:65; Mon 184 f 39.  
 Cereus exerens Linke ex Pf en 99; Web dict  
 280.

Cereus virens Pf en 99:—"C. crectus simplex  
 5 angu aris; sinibus acutis, tandem planis; costis  
 rotundatis; areolis subremotis, tulvis, vix  
 prominentibus, lanuginosis; aculeis 4-5 subulatis  
 fulvis brevissimis deorsum spectantibus,  
 centrali horizontali fusco rigido."  
 Foerster 387. S 47. Lab 359 (non DC).  
 Cereus affinis Hort Berol, Pf en 99.  
 Cereus warmingii K S F1 Br 204.  
 Cereus articulatus Hort non Pfeiffer.  
 Cereus tilophorus Pf AGZ 3:380; en 100.  
 Cereus sublanatus S 333; Pf en 100; Lab 360.  
 Foerster handb cact 401, ed 2, 687.  
 Pilocereus Houlettianus Lem non houlettii.  
 Pilocereus oligogonus Foerster cat Sencke;  
 handb cact ed 2, 677. Lem rev hort 1862, 428.  
 Pilocereus virens Lem III hort 1866, misc 20.  
 Mathss MfK 2:39 f.

We quote Schumann in above synonymy who  
 calls it a Brazilian, while Pfeiffer says Mexico!

**PILOCEREUS FIMBRIATUS** Lem.  
**PILOCEREUS FULVICEPS** Web.  
 KS Mon 176.  
 Pilocereus Hoppenstedtii Web in part fide KS.  
 Tehuacan, Puebla, Mexico.

**PILOCEREUS GOUNELLEI** Web.  
**PILOCEREUS HERMENTIANUS** L-C.  
 Lem et Cons III hort XIII t 469.  
 Foerster handb cact ed 2, 666.  
 KS Mon 186.

Cereus hermentianus Monv III hort VI misc  
 1850. Lem Rev hort 186, 410.  
**PILOCEREUS HOPPENSTEDTII** Web.  
 Weber in cat Pfersdorff 1864.  
 Foerster handb cact ed 2, 667.  
 KS MfK 4:80; Mon 177.

Cephalocereus hoppenstedtii KS nat pflzf III  
 (6a) 181.  
 Pilocereus hogendorpii Reg in Gartenflora,  
 1859, 220 (non hogendorpii).  
 Pilocereus lateralis Weber.

Viejo is the Mexican name for this  
 unique plant, the name signifying an old  
 man, while Pilocereus Houlettii is called  
 vieja—the old woman—the one bearing an  
 edible fruit, the other said by the natives  
 to bear no fruit. El Viejo grows  
 15 to 20 feet high, rarely branching ex-  
 cept from the upper sustained; of equal  
 size at the top and bottom but of an en-  
 larged diameter between. Ribs 19-25, ob-

tuse, intervals very shallow, the number of ribs increasing with age by bifurcation and new ones appearing above the forks. Areolae one-quarter inch apart, small, young parts bearing 30 or more slender flexuous white spines 4-9 inches long; spines at length deciduous or nearly so, the ribs often with a continuous woody ridge enclosing the areolae. Our illustration well shows the beauty of a young plant, but in no way depicts the mature growth; especially the top slightly bent, and ornamented with a mass of whitish wool which continues on one side a third of the way down—the lower portion yellow from age. States of Oaxaca and Puebla, Mexico (Orcutt 2705).



CEREUS HOPPENSTEDTI.

**PILOCERUS LANUGINOSUS** Rumphl.  
*Pilocereus lateribarbatulus* Rumphl. is  
*Cephalocereus columna-trajani* fide KS.  
*Pilocereus militaris* Hort. is chrysolmalus.

**PILOCERUS MORITZIANUS** L.-C.  
**PILOCERUS PALMERI** Engelm.

"Stems branching, 3 or 4 angled, 12-15 dm high; spines in greenish-brown bunches; fruit greenish-yellow, its areolae bearing 5-8 stout spines. Type, Palmer 70 of 1869 in hb Mo bot gard. Sonora."—Coulter, Cont Na hb 3:401.

**PILOCERUS PENTAEDROPHORUS** Cons.

**PILOCERUS POLYGONUS** KS.  
**PILOCERUS POLYLOPHUS** S.  
**PILOCERUS ROYENII** Rumphl.  
**PILOCERUS RUSSELLIANUS** Rumphl.  
**CEREUS SARGENTIANUS** Orcutt.  
**PILOCERUS SARGENTIANUS** Orcutt  
**PILOCERUS SCHLUMBERGERI** Web.

**PILOCERUS SCHOTTII** Lem.  
**CEREUS SCHOTTII** Engelm.

Stems 8-10 from the same base, 4-10 feet high, 4-5 inches in diameter, ribs 4-7, areo-



PILOCERUS HOULETTII Lem.

line distant; spines on sterile part short, stout, 4-6 radials and 1 central; the spines on fertile part 1-4 inches long, pendulous, forming a reddish-gray beard, in which the flowers and small fruit are nearly hidden. Seeds large, with hooked cotyledons. Sonora.

Variety **AUSTRALIS** K. Brandegee.

"Stems more slender and upright than the northern forms; ribs in the fertile ends, often as many as 10; areolae smaller, and more distant, and the long spines commonly fewer and stouter; abortive spine or gland (?) below the acute base of areolae more conspicuous."—Katharine Brandegee, Zoe, 5:4.

Near Guaymas, Sonora (Orcutt).

**PILOCERUS SCOPARIUS** Pos.

**PILOCERUS SENILIS** Lem.

**CEREUS SENILIS** Salm.

Is *Cephalocereus senilis* Pf.

**PILOCERUS STRICTUS** Rumphl.

**PILOCERUS TETETZO** Web.

**PILOCERUS URBANIANUS** KS.

*Pilocereus Vellozoi* Lem. is *Cephalocereus melocactus* fide KS.

**PILOCERUS VERHEINEI** Rumphl.

**CEREUS WEBERI** Coulter.

"Plant about 10 m high, with a regular candelabra form of branching (2 main branches each producing near the base 2 other branches, all ascending), branches and main stem of same diameter, angled and glaucous; areolae 3-5 cm apart; spines stout, bulbous at base; radials 10 or 11, 2-5 cm long; central solitary, 6-10 cm long, laterally compressed, sometimes a little deflexed; flowers lateral, white, 8-11



cm long; fruit 'as large as a small orange,' covered with small scales bearing axillary wool and spines. Type, Weber, material in hb Mo bot gard. 'A few miles south of Tehuacan', Puebla, Mexico."—Coulter, Cont Na hb 3:410.

**PILOCEREUS SCOPARIUS** Pos.

"A. borescens ramosus 20-25 pedes altus, trunci diametro 2-3 pollicari. Ramis junioribus nondum florentes 12-15 costati, costis obtusis crenulatis, areolis 8-12 lin. inter se distantibus nudis subprominentibus, aculeis radiantibus 5, centrali uno valido pollicari. Ramise iores flores producentes tenuiores 20-25 costati, costis humilioribus obtusioribus et multo magis confertis, areolis confertissimis, aculeis exterioribus 5-7; 10-12 lin. longis setiformibus brunneis, centrali uno. Flores rari-simi parvi subcampanu lati tubicundi. Prope la Soledad.—AGZ 1853, 126.

Subgenus **ECHINOCEREUS** E. "Low and usually caespitose plants, mostly with numerous oval or cylindrical heads, short flowers, green stigmas, and spiny fruit; seeds subglobose, covered with confluent tubercles; embryo straight, with very short cotyledons.

**CEREUS ACIFER** Otto.

*Echinocereus acifer* (em cact 57.

*Echinocereus durangensis* Pos ex F ed 2, 799.

Variety **BREVISPINULUS** Jac.

Variety **DU ANGENSIS** Hort.

Variety **TENJISSPINUS** Jac.

*C. adustus* E, is *pectinatus* var?

**C BLANCKII** Pos AGZ 1853, 131:—

"C. e viridi nigrescens 5-8 poll altus diametro sesquipollicari apice attenuatus, costis 8-10 verticaliter decurrenibus, areolis gibbis mammæformibus insertis, nudis, aculeis exterioribus 8-10 semipollicaribus fuscis, summis minimis, centrali uno pollicari. Prope Camargo "

**CEREUS BERLANDIERI** E.

*Echinocereus berlandieri* Lem cact 56.

KS nat 185: Mon 256.

Stems 1½-6 inches long, an inch thick, bearing sweet-scented purple flowers 2-4 inches in diameter; a native of southern Texas and Mexico.

**CEREUS BRANDEGEEI** Coulter.

Caespitose, often 2 feet or more across, consisting of few to many cylindrical heads mostly 6 or 8 inches high, 1½-2 in diameter, with 8 or 9 interrupted, strongly tuberculate ribs. The young spines frequently tinged with brilliant magenta, the older spines variable in color, often of an ivory white with centrals of a deep magenta—making a very handsome color-effect. "Spines at first variegated, dark and reddish, becoming more or less ashy-black; radials 10-16, rigid, terete, radiant, mostly uniform, 8-12 mm long; centrals almost always 4, very stout and prominent, 3-4 cm long, cruciate, conspicuously angled and compressed, sometimes twist-

ed, the lowest usually the most flattened and sword-like (2-3 mm broad): flowers red, 4-5 cm long, with conspicuous woolly and spine-bearing areolae over the ovary and lower part of the calyx. Type in hb Brandegee, El Campo Allemand and San Gregorio, Baja California."—Coulter, Cont U S Nat hb 3:389 (1 Ap 1896).

This has much the same aspect as *Cereus Engelmanni*, with similar variations in the color of the spines, and bears a similar edible fruit.

**CEREUS CAESPITOSUS** .

**CEREUS CHLORANTHUS** E.

**CEREUS CINERASCENS** P DC.

*C. CIRRHIFERUS* Lsb mon 311:—

"Tige rameuse, tres-prolifere, caespitose; rameaux a 5 cotes arrondies, subtuberculees, convexes; sillons aigus; areoles rondes; 10 aiguillons extérieurs tres-ouverts, adprimes, ronds, blancs, transparents, noduleux a la base, 4 intérieurs eriges, egalement noduleux a la base, de memes couleurs que les autres, chamois a la base; tout contournees irregulierement. Rameaux de 5-6 et 10 cent. de long sur 3, 3 et demi de diametre; areoles espaces de 15 mm, nues ou garnies de tomentum court et rare; aiguillons extérieurs, 4 cm de long; aiguillons intérieurs, 4 et demi a 5 cm de long; tous noduleux et chamois a la base, blancs, transparents, contournees, ques-uns contournees en forme de vrille s'appliquant sur la plant. Fleur tres-belle, grande, rouge cramolsi vif, dit-on. Mexique."

**CEREUS CTENOIDES** E.

**CEREUS DASYACANTHUS** E.

*Echinocereus degandii* Rebut cat.

*Echinocereus dasycanthus* Lem cact 57.

Plant 5-12 inches high, densely covered with numberless delicately colored spines, and bearing large showy orange yellow flowers. El Paso, Texas, and Mexico.

Variety **NEO MEXICANUS** Coulter.

"Differs in the remote areolae (1.5 cm apart), fewer spines (11 radials and 4 centrals), which are much stouter, 10-12 mm long, radiating, scarcely (if at all) pectinate, and larger seed (1.5 mm in diameter). Type. Wright 36 in hb Mo bot gard. Southeastern New Mexico."—Coulter, Cont Na hb 3:384.

**CEREUS DUBIUS** E.

*Echinocereus dubius* Fed 2, 787 KS mon 276.

**CEREUS EHRENBERGI** Pfeiffer.

Suberect, flaccid, green; 6 obtuse repand-tuberculate ribs, areolae subremote, with short white wool; 8-10 radial spines, 4 longer erect centrals, all slender, rigid, light yellow. Real del Monte, Mexico.—Pf AGZ 1840, 282.

**CEREUS ENGELMANNI** Parry.

Engelmann's cushion cactus. Heads several (sometimes, though rarely, a hundred,) 4 to 12 inches high, cylindrical or ovate, with 11 to 13 ribs bearing bunches of about 13 pale radiating spines, and about 4 darker (yellow,

brown or black), stout and angular, straight or curved central spines, 1 to 3 inches long. Flowers very numerous, bright magenta, often  $\frac{1}{2}$  inches across, followed by delicious fruits, with much the same flavor of a strawberry, red, pulpy, filled with black seeds. Utah, California, Baja California and Arizona.

**CEREUS ENNEACANTHUS E.**

**CEREUS FENDLERI E.**

Bot mag t 6533; Weber dict 278.

Echinocereus fendleri F ed 2, 801.

A queer irregular caespitose plant of Arizona, New Mexico and Sonora, rarely more than 12 heads in a cluster, stems 3-4 inches in diameter and about 6 inches high, distinguished by the one usually black central spine, which often curves upward. Flowers magenta colored.

**CEREUS GLOMERATUS E.**, is *C. Maritimus* Jones.

**CEREUS KNIPPELIANUS Orcutt.**

Echinocereus knippelianus Liebn.

Mfk 5:159, 170; KS mon 223 f 47.

E. liebnerianus 'Carp' Balt cact jour 2:262.

**CEREUS LEONENSIS Orcutt.**

Echinocereus leonensis Mats.

**CEREUS LONGISETUS E.**

Echinocereus longisetus Lem cact 57.

Is viridiflorus fide Orcutt rev 32.

**CEREUS MAMILLATUS Hge.**

**CEREUS MARGINATUS DC.**

"Stem simple or branching at apex, erect, dark green, 5-7.5 cm in diameter, ribs 5-7, obtuse, with acute intervals, woolly through the whole length on account of the concentric areolae; spines 7-9, short (4-6 mm) and conical, rigid, grayish (younger ones purplish-black, the central scarcely distinct from the rest); flower brownish purple, slender-tubular, 3-5 cm long; fruit globular and spiny. Type unknown. From San Luis Potosi southwest throughout Mexico. The stem is often covered with a woody crust, and the woolly confluent areolae are often double. It is said to be frequently used for hedges in southern Mexico."—Coulter, Cont Na hb 3:339. *Cereus gemmatus* Zucc ex Pfr Enum 96.

**CEREUS MARITIMUS M. E. Jones.**

"Caespitose, heads 5-20 in a bunch, which is often 2-3 feet in diameter and a foot high; each plant cylindrical, obovate or in small specimens a most round,  $\frac{1}{2}$ -4 inches long, three-fourths to  $\frac{1}{2}$  wide; principal spines 4, straight, angled and somewhat twisted at base,  $1\frac{1}{2}$  inches long, beneath these are 8-10 very short spines which are either straight or hooked; spines light brown, except when young, then red at base, springing from a very short but copious wool; flowers light yellow, about  $\frac{1}{2}$  inches long and wide; perals obconiculate or obovate, rounded, margin irregular, ovary obovate, sessile or short stalked, covered with bunches of white or yellow, often hooked, short spines arid crisped wool; fruit not mature. Encenada, Baja Cali-

fornia."—Jones, Am naturalist 17:973 (S 1883).

*Cereus glomeratus et flaviflorus* E. C. sanborgianus? *C. maritimus* Coulter, in part.

**CEREUS MOJAVENSIS Engelm.**

**CEREUS PACIFICUS E.**

*Cereus phoeniceus* var. *pacificus* Engelm, MS.

"Plant caespitose, 1-4 feet in diameter, few to 500 short stems (6-9 inches long and 2-2 $\frac{1}{2}$  inches in diameter) in each, forming dense oval cushions; stems with 10-12 obtuse ribs, shallow intervals, and an equal number of internal ligneous fibers; radial spines 1-12 and of an average length of one-fourth inch, the 4 central spines larger, three-fourths to 1 inch long, slender, white; flower an inch across, including the ovary  $\frac{1}{2}$  inches long, the oblong spatulate sepals bright red with a broad purplish mid vein; ovary and fruit with 25-30 spiny areolae; fruit fleshy with numerous small seed; stamens slender, as long as sepals; anthers small, red; style three-fourths inch long, stigmata 6-8, greenish."—Or W 2:46 (Je 1886).

Type locality. near Todos Santos bay, Lower California.

**CEREUS PECTINATUS E.**

Variety **CENTRALIS** Coulter.

"Plant 6-8 cm high; centrals usually 4, the lowest very short (3-4 mm) and correct, the upper 2 or 3 as long as the radials (sometimes longer), and recurved upward. Type, Wilcox of 1894 in Na hb. Arizona, near Fort Huachaca."—Coulter, Cont Na hb 3:386.

**CEREUS POLYACANTHUS Engelm.**

Echinocereus polyacanthus F ed 2, 790 f.

*Cereus lecanus* Hooker bot mag t 4417; Hems 543; Weber dict 278.

Echinocereus lecanus Lem cact 57; F ed 2, 823.

*Cereus multicoctatus* Cels cat.

*Cereus pleigonus* Lab mon 317.

**CEREUS POSELGERIANUS A. Lke.**

Echinocereus poselgerianus A Lke AGZ 1857, 239; F ed 2, 773; KS nat 185: mon 257 (non pos-ri).

**CEREUS PROCUMBENS E.**

**CEREUS RIGIDISSIMUS Engelm.**

*Cereus pectinatus*, var? *rigidissimus* E Am ac pr 3:279; Mexican boundary R, 31; collected writings 136, 195.

Echinocereus candicans of catalogs.

The Rainbow Cacti of Southern Arizona and Sonora is noted for the beautiful and varied coloring of the all radiating and interlocking, extremely rigid and acute spines, the latest ones of each season being rose-colored, and the earliest ones a pale yellowish, thus forming variegated rings around the stems. Flowers 2 $\frac{1}{2}$ -3 inches high, 2 or 3 in diameter.

**CEREUS ROEMERI E.**

**CEREUS ROEMERI E.**

**CEREUS STRAMINEUS Engelm.**



## CEREUS SUBINERMIS Hem.

## CEREUS VIRIDIFLORUS Engelm.

The Green-flowered Cereus of the Rocky Mountains is especially beautiful on account of the red, purple and white spines with which the plant is covered. Flowers numerous, quite large and showy, light-yellowish-green, very hardy and easily grown.

## Genus CLEISTOCACTUS Lemaire.

*C. baumanni* Lem in Ill Hort viii Misc 35; Cact 59, based on *Cereus tweedii* Bot Mag t 493.

*C. coubrinus* Lem in Ill Hort viii Misc 35; Cact 60, is *Cereus coubrinus*.

*C. rhocacanthus* Lem in Ill Hort viii Misc 35; Cact 61; is *Echinopsis rhodacantha*.

## Genus CONSOLEA Lemaire.

*C. catacantha* Lem Rev Hort (1862) 174; Cact 91; is *Opuntia catacantha*.

*C. ferox* Lem Rev Hort (1862) 174; Cact 91; is *Opuntia ferox*.

*C. leucacantha* Lem Rev Hort (1862) 174; Cact 91; is *Opuntia leucacantha*.

*C. rubescens* Lem, Rev Hort ix Misc 26 (18 2); Cact 90; is *Opuntia rubescens*.

*C. spinosissima* Lem, Rev Hort ix Misc 62; Cact 91; is *Opuntia spinosissima*.

## Genus CORYPHANTHA Lemaire.

Based on the subgenus *Coryphantha* Engelm. of *Mammillaria*, and 24 species and one variety named, without descriptions, in *Les Cactees*, 34-35. *C. acanthosternis*, *aulacohela*, *carinata*, *clava*, *cornifera*, *elephantides*, *electa*, *Lehmanni*, *loricata*, *macromeris*, *ottobis*, *pycnacantha*, *raphidacantha*, *scheeri*, *schlechtendalii*, and *sulcolanata* are presumably based on species of *Mammillaria* of the same names. *C. daimonoceras* is probably a scolymoides *C. conspicua*, Engelm. *glandulifera*, *hetromorpha*, *Hookeri*, and *subarata* are nomina nuda. *C. bromamma*, *exsulans*, *impexcoma*, and *Nuttallii* are names credited to Lemaire in Foester (Handb ed 2). *C. ancistrocantha* is named by Lemaire as a variety of *raphidacantha*. *C. glandulifera* and *heterophylla* Lem. in *Index Kewensis*, are evident y errors.

## Genus ECHINOCACTUS Link &amp; Otto.

"Flowers about as long as wide. Ovary covered with sepoid scales naked or woolly in their axils. Fruit succulent or sometimes dry covered with persistent cal x-scales, sometimes enveloped in copious wool, and usually crowned with the persistent remnants of the flower. Seed obliquely obovate, black. Embryo curved over the small albumen cotyledons parallel to the sides of the seed.—Mostly large, sometimes gigantic, globose or depressed, or ovate, or rarely subcylindric, simple or very rarely cespitose; bunches of spines on the more or less vertical ribs. Flowers contiguous to and above the spines, on the latest growth of the plant, often from the nascent woolly areolae and therefore more or less vertical, open only in sunlight."—E.

*Echinocactus acutangulus* Zucc, is corynodes.

*E. abrocentrus* Steibn. ?

*E. ACANTHION* Salm-Dyck.

"Caulis globoso laete viridi, costis numerosissimis (35-40) valde compressis parum undulatis ad pulvillos inflatis, pulvillis conertis junioribus albidovelutinis, aculeis superioribus 3 appianatis intermedio validissimo, cum centralibus 2 subulatis bifarie patentibus, basi stramineis superne fulvido-brunneis, inferioribus 8 multo gracilioribus patentibus albidis. Caulis robustus, validus, diametro quadripollicari et ultra, aculeis tectus pollicem ad sesquipollicem longis. Unica hucusque species est in hacce Sectione aculeis centralibus duobus Flores ignoti." HD ed 2, 161, 31.

ECHINOCACTUS ACUTISSIMUS O-D.

ECHINOCACTUS ALBATUS Dietr.

ECHINOCACTUS ALTEOLENS KS.

ECHINOCACTUS AMBIGUUS Hildm.

ECHINOCACTUS ANFRACTUOSUS

Mart.

ECHINOCACTUS ARRIGENS L-O.

ECHINOCACTUS ASTERIAS Zucc.

Is *Astrophytum myllostigma*.

ECHINOCACTUS BEGUINII Web.

ECHINOCACTUS BICOLOR Gal.

Near San Luis Potosi, Mexico.

Variety SCHOTTII Engelm.

*Echinocactus bolansis* Runge, is bicolor.

ECHINOCACTUS BREVIHAMATUS E.

ECHINOCACTUS CALIFORNICUS Mon.

ECHINOCACTUS CAPRICORNUS Dietr

ECHINOCACTUS CASTANEO-DES

Cels.

*Echinocactus castanensis* Hort, is bicolor.

ECHINOCACTUS CENTETERIUS Lem.

ECHINOCACTUS CERATITES Otto.

ECHINOCACTUS CHILENSIS Hildm.

ECHINOCACTUS CHRYSACANTHION

KS.

ECHINOCACTUS CHRYSACANTHUS O.

Globose to cylindrical, with about 18 ribs and 10 flexuous annulated central spines 2 inches long, and 4 to many slender white radial spines. Flowers satiny yellow, more rarely crimson. Cedros Island.

ECHINOCACTUS CONCINNUS Monv.

ECHINOCACTUS COPTONOGONUS Lm.

Near San Luis Potosi, Mexico.

Variety MAJOR Salm-Dyck.

ECHINOCACTUS CORNIGERUS DC.

Near San Luis Potosi, Mexico.

ECHINOCACTUS CORYNODES Otto.

State of Rio Grande do Sul, Brasil.

ECHINOCACTUS COXII KS.

ECHINOCACTUS CRISPATUS DC.

ECHINOCACTUS CUMINGII Hopff.

Bolivia, South America.

ECHINOCACTUS CURVISPINUS Colla.

ECHINOCACTUS CYLINDRACEUS E.

ECHINOCACTUS DENUDATUS L-O.

ECHINOCACTUS DICHROACANTHUS

Mart.

ECHINOCACTUS DURANGENSIS Rge.

ECHINOCACTUS EBENACANTHIUS  
Monv.

ECHINOCACTUS ECHIDNA P D-C.

ECHINOCACTUS ECHINOIDES Lem.  
Bolivia, South America.

ECHINOCACTUS EHRENBERGII Pf.

ECHINOCACTUS ELECTRACANTHUS  
Lem.

Echinocactus ellipticus Lem, is bicolor.

ECHINOCACTUS EMORYI Engelm.

Cylindrical, rarely exceeding 2 feet in diameter and 6 feet in height; ribs sharp, usually tuberculate and 21 in number; radials 5 or more, usually 8, stout, annulated, terete, reddish, yellowish, white or ash, commonly straight or curved inward, 1-2 inches long; the 1 central straight or more or less curved downward, 2-3 inches long, otherwise like the radials.

Gila Bend, Arizona, southward to near Guaymas, Sonora (Orcutt 2578, 2605).

Echinocactus equitans Scheldw, is horizontalis.

ECHINOCACTUS ERECTOCENTRUS C.

ECHINOCACTUS ERINA EUS Lem.

State of Rio Grande do Sul, Brasil.

ECHINOCACTUS EXCULPTUS Otto.

ECHINOCACTUS FALCONERI Orcutt.

Plant cylindrical in age, 9-12 inches in diameter, usually under 2 feet high, light apple green in color, with a withered appearance (perhaps not normal); ribs tuberculate, acute, spirally inclined (hence called caracola, "snail", or biznaga caracola), usually 13, to rarely 17, intervals narrow and deep; radial spines 10 or less, grayish white, flattened, flexuous, 1-2½ inches long and laterally disposed; central spines 7, stout, strongly annulated, reddish brown, the 3 upper and 3 lower of about equal length, divergent, 1-3 inches long, terete or slightly angled, straight; the longest central erect, straight, flattened or channelled above, ¼ inch broad or less, varying from 1 to 6 inches in length sometimes on the same plant, uniformly about ½ inch at the tip turned downward at right angles with the main portion of the spine, forming a short hook. Named in honor of William Falconer. Type, Orcutt, No. 2603:—Batamotal, Sonora, Mexico.

Flower and fruit will be described later, but resemble those of E. Wislizeni, with which the plant has perhaps hitherto been confounded.

ECHINOCACTUS FLAVOVIRENS  
Scheldw.

Tehuacan, Puebla, Mexico.

ECHINOCACTUS FORDII Orcutt.

Globose, 6 inches or more in diameter, with about 18 tuberculated narrow ribs closely set with clusters of stout ashy gray spines. 4 central, annulated, the longest 1¼ inches long, and hooked; 2 slender spines above with about 14 divergent radials; lower an inch across, about 2 rose purple areoles in 2 series, 9 greenish stigmata, style tinged with red, filaments red at top and yellow at base, anthers orange yellow. Near Lagoon Head, Baja California. Named for

Lyman M. Ford, of San Diego, who has taken a great interest in cacti. Apparently the same plant was distributed in 1894, from near San Quintin bay, as a form of E. peninsularis.—Orcutt Rev 81; 56 (nomen).

ECHINOCACTUS GIBBOSUS P DC.  
Argentine Republic.

ECHINOCACTUS GLADIATUS S.

ECHINOCACTUS GLAUCUS KS.

ECHINOCACTUS GEISSEI Pos.

ECHINOCACTUS GRANDICORNIS  
Lem.

ECHINOCACTUS GRUSONII Hildm.

ECHINOCACTUS HAEMATACANTHUS  
Monv.

Tehuacan, Puebla, Mexico.

ECHINOCACTUS HASELBERGII F  
Hge sr.

Brazil, South America.

ECHINOCACTUS HASTATUS Hpfrr.

ECHINOCACTUS HAYNEI Otto.

ECHINOCACTUS HETEROCHROMUS  
Web.

ECHINOCACTUS HEXAEDROPHO-  
RUS Lem.

Near San Luis Potosi, Mexico.

ECHINOCACTUS HILCENSIS Hildm.

ECHINOCACTUS HORIZONTALIUS Lem

Near San Luis Potosi, Mexico.

ECHINOCACTUS HORRIFILUS Lem.

ECHINOCACTUS HUMILIS R A Phil.

ECHINOCACTUS HYPTIACANTHUS  
Lem.

ECHINOCACTUS INGENS Zucc.

Plant 2-5 feet high, 1-2 in diameter, simple, or occasionally wolloferous, forming enormous masses as much as 10 feet in diameter! Ribs 25-32, of en bifurcate, acute, tuberculate-interrupted, areolae 1 inch long, an inch apart, or, in old plants, forming a continuous woolly ridge along the ribs, the depressed top densely tomentose, enveloping the flowers and fruit. Spines all stout, annulated, straight, the 4 central of nearly equal length, 1¼ inch long, divergent, the radials three-fourths inch long or less, 3-4 above and 3 below the central—sometimes 2 or more additional radials, laterally disposed. Flower 2 inches across, 1 and three-fourths long; petals about 20, acute, ¼ inch broad, canary yellow, tipped with a tinge of rose; about 30 long narrow acute sepals and scales on the ovary with woolly axils. Anthers, filaments and style rich orange yellow; stigmata 7, ¼ inch long, spreading, style three-fourths inch long; anthers small, filaments short. Flowers deeply imbedded in the dense copious wool an inch long that fills the depressed top of the plant. Plant dark apple green, young plants especially decorated with broad horizontal bands of maroon on the ribs, zebra-like or the areolae on the ribs margined with bands of maroon. This is one of the largest of the biznaga plants, used in making 'dulces.' State of Puebla, Mexico (Orcutt 237). Carloads of these plants are said to be annually used in the native confectionery shops.

Mrs. Anna B. Nickels mentions a single plant sent to Europe that weighed four tons! Dr. C. C. Parry cites the woolly or silk-like substance produced so abundantly at its depressed summit, as col-



lected and employed for stuffing pillows, and Don Louis Eschavz'er complains of having had to pierce spines cut of beds made of this material. Ribs said to vary from 20 to 50 in number. Greatest recorded height 9 feet, diameter  $9\frac{1}{2}$  feet.

*ECHINOCACTUS INTERTEXTUS* Em.

*ECHINOCACTUS JOHNSONII* Engelm.

Johnson's hedgehog cactus was named for J. E. Johnson, an early Mormon naturalist, who discovered it about S.

George in southern Utah. It is a rare and handsome plant, 4 to 7 inches high, oval, 3 to 5 inches in diameter, densely covered with stout reddish-gray spines—turning deep red when wet. The flower is about  $2\frac{1}{4}$  inches broad, of a rose purple normally, but some plants which opened their flowers while packed in a box away from the light leave light yellowish-green petals marked with deep maroon at base. Anthers pale primrose yellow; filaments  $\frac{1}{2}$  inch long, the inner ones white, outer ones reddish. Growing in out-of-the-way desert places in Nevada, Arizona, and California, it costs much trouble to secure this beautiful species.

*ECHINOCACTUS JUSSIEUI* Monv.

*ECHINOCACTUS KRAUSEI* Hildm.

*ECHINOCACTUS KUNZEI* F.

*ECHINOCACTUS LAMELLOSUS* Dietr.

*ECHINOCACTUS LECONTEI* Engelm.

Plant 3-4 feet high, about one-third that in diameter, clavate; flower 2 inches long, lemon yellow. Type locality on the lower parts of the Gila and Colorado rivers, and in Sonora. The Mohave and Colorado Desert plants, usually referred to this species, seem to me distinct. This now seems to me distinct from either *E. Wislizeni* or *E. cylindraceus*.

Our colored portrait fairly well represents a young plant from Arizona, but does not show the distinguishing characteristics.

*ECHINOCACTUS LENINGHAUSII* KS.  
Brazil, South America.

*ECHINOCACTUS LEUCACANTHUS*  
Zucc.

*ECHINOCACTUS LIMITUS* Engelm.

*ECHINOCACTUS LONGIHAMATUS* Gal.

*ECHINOCACTUS LOPHOTHELE* S.

*ECHINOCACTUS McDOWELLII* Rebut.

*ECHINOCACTUS MACRODISCUS* Mart.  
Near San Luis Potosi, Mexico.

*ECHINOCACTUS MALLETIANUS* Lem.

*ECHINOCACTUS MARGINATUS* S.  
Bolivia, South America.

*ECHINOCACTUS MATHSSONII* Berge.

*ECHINOCACTUS MEGALOTHELOS*  
Selcke.

Paraguay Republic, South America.

*ECHINOCACTUS MONVILLEI* Lem.

Paraguay Republic, South America.

*ECHINOCACTUS MICROMERIS* Weber.  
Weber, Bios dict 804. K Br Zoe 5:5.  
Mammillaria micromeris E. Epithelantha micromeris Weber.

*ECHINOCACTUS MICROSPERMUS*  
Web.

Argentine Republic.

*ECHINOCACTUS MINUSCULUS* Web.

Argentine Republic.

*ECHINOCACTUS MITIS* R A Phil.

*ECHINOCACTUS MULTICOSTATUS*  
Hildm.

*ECHINOCACTUS MULTIFLORUS* Hook

*ECHINOCACTUS MURICATUS* Otto.

Brazil, South America.

*ECHINOCACTUS MUTABILIS* F.

Peru, South America.

*ECHINOCACTUS NAPINUS* R A Phil.

*ECHINOCACTUS NETRELIANUS*  
Monv.

*ECHINOCACTUS NIGRICANS* D'ér.

*ECHINOCACTUS OBVALLATUS* P DC.

*ECHINOCACTUS OCCULTUS* R A Phil.  
Chile, South America.

*ECHINOCACTUS ODIERI* Lem.

*ECHINOCACTUS OLIGACANTHUS* S.

*ECHINOCACTUS ORCUTTII* Engelm.

"Heads cylindrical, 10-18 inches in bulging in the middle, growing single or amer and 2-3½ feet high, sometimes often cespitose, more rarely proliferous at base, with 13 when young, to usually 20 or 22 obtuse tuberculate ribs and a woolly, spineless, depressed top; spines stout, reddish, straight or recurved, all annulate, usually 9 radiating and 4 stouter central ones; flowers deep dull crimson with greenish or lighter colored margins to the petals, 2 inches long, otherwise as in *E. viridescens*; stigmata green, 16-20; fruit pulpy, crimson, scaly, with numerous small seeds"—Or W 2 :46 (Je 1886).

Type locality: Palm valley, Lower California.

*ECHINOCACTUS ORNATUS* P DC.

*ECHINOCACTUS OTTONIS* L O.

Brazil, South America.

*ECHINOCACTUS PAMPEANUS* Speg-  
azz.

*ECHINOCACTUS PAPYRACANTHUS* E.

*ECHINOCACTUS PARRYI* E.

*ECHINOCACTUS PENINSULAE* Eng.

Globose to cylindrical, rarely over 18 inches in diameter, rarely attaining a height of 8 feet; the 12-21 compressed tuberculated ribs set with clusters of dull red spines; centra 7, stout, the stoutest not rarely 4-6 inches long and  $\frac{1}{4}$  inch broad hooked.

*ECHINOCACTUS PENTACANTHUS*  
Lem.

Near San Luis Potosi, Mexico.

*ECHINOCACTUS PEPINIANUS* Lem.

*ECHINOCACTUS PFEIFFERI* Zucc.

*ECHINOCACTUS PHILIPPII* KS.

*ECHINOCACTUS PHYLLACANTHUS*  
Mart.

*ECHINOCACTUS PHYMATOTHELOS*  
Pos.

**ECHINOCACTUS PILOSUS** Gal.

Near San Luis Potosi, Mexico.

**ECHINOCACTUS PLACENTIFORMIS** Ks.**ECHINOCACTUS POLYANCISTRUS** Eb

The Hermit cactus, so-called because it is rare to find more than one in a place, is a strikingly beautiful cactus which I have seen only on the Mohave desert in its wild state. The largest plant I have seen is 18 inches high and 4 inches in diameter; each tubercle bears three to seven hooked, round, brownish-pink spines, with which are interspersed fewer ivory white spines, not hooked, very pleasing in contrast. Flower over 2 inches long, of equal width, petals bright magenta, green at base, filaments and stigmata green, anthers white. They were once catalogued at \$15 apiece, and are still rare in collections, unfortunately seldom long surviving transplanting from their native sands. Too much moisture soon proves fatal.

**ECHINOCACTUS POLYCEPHALUS** E.

Heads many from a single base,  $\frac{1}{2}$ - $2\frac{1}{2}$  feet high, globose to cylindrical, ribs 13-21, acute; circular areolae bearing 8-12 stout compressed annulated curved reddish gray spines, 4-12 radial, or 4 stouter central ones; flowers enveloped in a mass of dense white wool,  $1\frac{1}{2}$  inches long, petals about 30, lance-linear, yellow; about 100 rigid dark pointed setae upon the ovary, hidden in the wool, those of the tube similar and equally numerous; stigmas 8-11, linear; fruit dry, full of angular wrinkled and minutely tuberculate seeds 4 mm long. Gravelly soil on the Mohave and Colorado deserts, in California, flowering in F, fruiting in Mr.

**ECHINOCACTUS POTTSII** S.**ECHINOCACTUS PUMILUS** Lem.**ECHINOCACTUS RECURVUS** L-O.

Oaxaca, Mexico.

**ECHINOCACTUS RINCONADENSIS**

Pos.

**ECHINOCACTUS ROBUSTUS** L-G.

Tehuacan, Puebla, Mexico.

**ECHINOCACTUS SAGLIONIS** Cels.

Argentine Republic.

**ECHINOCACTUS SAUSSIERI** Web.**ECHINOCACTUS SCHICKENDANTZII**

Web.

Argentine Republic.

**ECHINOCACTUS SCHILINZKYANUS**

F Hge jr.

Paraguay Republic, South America.

**ECHINOCACTUS SCHUMANNIANUS**

Nic.

Paraguay Republic, South America.

**ECHINOCACTUS SCHEERII** Sm-Dyk.**ECHINOCACTUS SCOPEA** L-O.

Brazil, South America.

**ECHINOCACTUS SELLOWII** L-O.

State of Rio Grande do Sul, Brasil.

**ECHINOCACTUS SENILIS** R A Phil.

Chile, South America.

**ECHINOCACTUS SETISPINUS** E.**ECHINOCACTUS SILERI** Engelm.**ECHINOCACTUS SIMPSONI** Engelm.

Hedgehog Cactus of Colorado; the spines, ranging from white through shades of straw, yellow and brown, nearly hide the plant; flowers shell-pink to bright rose in color.

Variety **MINOR** Engelm.

Button or Snake Cactus: spines arranged in beautiful star-shaped clusters; flowers pale rose.

**ECHINOCACTUS SINUATUS** Dietr.**ECHINOCACTUS SMITHII** Mueh.

Near San Luis Potosi, Mexico

**Echinocactus tetraclonus** Lem, is Sel-  
owii.**ECHINOCACTUS SUBMAMMULUS** S

Lem.

South America.

**ECHINOCACTUS SUBNICER** Pos.**ECHINOCACTUS TABULARIS** Cels.**ECHINOCACTUS TETRAPLUS** Otto.**ECHINOCACTUS TEXENSIS** Hoepf.

Echinocactus tricolor Hort. is bicolor.

Echinocactus tricornis Monv. is alteoens

**ECHINOCACTUS TRICUSPIDATUS**  
Scheidw.**ECHINOCACTUS TROLIETI** Rebut.

Is unguispinus.

**ECHINOCACTUS TULENSIS** Pos.**ECHINOCACTUS TURBINIFORMIS** Pf.**ECHINOCACTUS UNCINATUS** Gal.**ECHINOCACTUS UNGUISPINUS** Engm**ECHINOCACTUS VILLOSIUS** Lem.

**ECHINOCACTUS VIRIDESCENS** Nutt.  
The Turk's Head cactus, that occurs at San Diego, California; very variable, but usually depressed, less than a foot in diameter, with strong, annulated reddish spines; 13 to 21 ribs; fruit greenish or sometimes tinged with magenta, very sour, enclosing numerous black seeds.

**ECHINOCACTUS WHIPPLEI** E. & B.

Whipple's hedgehog cactus is only 2 to 5 inches high, ovate-globose, characterized by seven compressed white radial spines and four broad hooked central spines. Flower  $1\frac{1}{2}$  inch long, petals and filaments pale straw color, the style and seven stigmata green.

**ECHINOCACTUS WILLIAMSII** Lem.

Anhalonium williamsii oerster bandb 233

Lophophora williamsii et var. lewinii Coulter nat hb cont 3; 131.

The Mescal Button, or Turnip cactus, as it is sometimes called (which forms the type of Coulter's genus Lophophora) is a small spineless plant with pretty rose-colored flowers. The plant rarely exceeds 3 inches in diameter, little appearing above the surface of the ground, but when eaten it pro-



duces peculiar intoxicating effects similar to those from the use of opium, and the plant enters into certain religious rites of the Indians of the Sierra Madre mountains in Mexico. A powerful drug is prepared from the plant by chemists.

**ECHINOACTUS WIPPERMANNII** Mueh.

**ECHINOACTUS WISLIZENI** Engelm. Variety **ALBISPINA** Tourmey. Variety **DECIPIENS** Engelmann.

**Genus ECHINOCEREUS** Engelmann. Included under the genus *Cereus*.

**E. Berlandieri** Lem, is *Cereus Berlandieri* E.  
**E. Blankii** Palm, is *Cereus Blankii* Pos.  
*Echinocereus conglomeratus* F, is *Cereus polyacanthus*.  
*Echinocereus leeanus* Lem, is *Cereus polyacanthus*.  
*Echinocereus leonensis* Maths, is *Cereus leonensis*.  
**E. Leptacanthus** KS, is *Cereus leptacanthus* S.  
*Echinocereus Merkeri* Hildm, is *Cereus Mereri*.  
*Echinocereus paucispinus* Lem, is *Cereus polyacanthus*.  
**E. procumbens** Lem, is *Cereus procumbens* E.  
**E. pulchellus** KS, is *Cereus pulchellus* Pf.  
**E. Saalm-Dyckianus** Scheer, is *Cereus Saalm-Dyckianus* Web.  
**E. Scheeri** Lem, is *Cereus Scheeri* S.  
**E. subinermis** 3, is *Cereus subinermis*.  
**E. tuberosus** Rumpf, is *Cereus tuberosus* Pos.

**Genus ECHINOPSIS** Zuccarini.

Included under the genus *Cereus*.

**ECHINOPSIS AMOENISSIMA** Wend.  
**ECHINOPSIS CATAMARCENSIS** Web.  
**ECHINOPSIS CINNABARINA** Lab. Bolivia, South America.  
**ECHINOPSIS DROEGEANA** Berge.  
**ECHINOPSIS D'ARIS-PAULI** F.  
**ECHINOPSIS EYRIESII** Zucc.  
**ECHINOPSIS FORMOSA** Jac.  
**ECHINOPSIS GEMMATA** KS. Brazil, South America.  
**ECHINOPSIS HUOTTHI** Lab.  
**ECHINOPSIS KUOTTHI** Schlumb.  
**ECHINOPSIS LAGEMANNII** D.etr.  
**ECHINOPSIS LLUCANTHA** Walp.  
**ECHINOPSIS MULLERI**. A hybrid, of rapid growth, blooming early, and with its large satiny rose-colored flowers is justly called the finest of its class.  
**ECHINOPSIS MULTIPLEX** Zucc. Brazil, South America.  
**ECHINOPSIS NIGRICANS** Link.  
**ECHINOPSIS OBREPANDA** KS. Bolivia, South America.  
**ECHINOPSIS OXYGONA** Zucc. Brazil, South America.  
**ECHINOPSIS PENTLANDII** S. Peru, South America.  
**ECHINOPSIS PUDANTII** Hort.  
**ECHINOPSIS RHODACANTHA** S.  
**ECHINOPSIS RHODANDII** Hort.  
**ECHINOPSIS SALMIANA** Web. Variety **SPIDREESII** KS.  
**ECHINOPSIS SCHICKENDANTZII** Web.

**ECHINOPSIS SIMPLEX** Niedt.  
**ECHINOPSIS TOUGARDII** L'Her.  
**ECHINOPSIS TUBIFLORA** Zucc. Variety **NIGRISPINA** KS.  
*Echinopsis turbinata* Zucc, is *gemmata* fide KS.

**ECHINOPSIS VALIDA** Monv. Paraguay Republic, South America.

Variety **FORBESII** R. Mey.  
**ECHINOPSIS WILKENSII** Hort.  
*Echinopsis zuccarini* (*zuccarini*) Pf, is *tubiflora* fide KS.

*Epithelantha micromeris* Web, is *Mammillaria micromeris* Engelmann.

**Genus EPIPHYLLUM** Pfeiffer.

**EPIPHYLLUM ALTENSTEINII** Pfr.  
**EPIPHYLLUM GUEDNEYRI** Houll.  
**EPIPHYLLUM MACKOYANUM** Hort.  
**EPIPHYLLUM OBOVATUM** E.  
**EPIPHYLLUM RUSSELLIANUM** Hook.  
**EPIPHYLLUM TRUNCATUM** Haw.

Inch, Crab, or Lobster Cactus; a native of Brazil, popular as a house plant.

**GRUSONIA CEREIFORMIS** F. Rehb, is *Opuntia cereiformis* Web fide KS.  
**Genus GYMNOCALYCIUM** Pfeiffer.

**G. gibbosum** Pf, is *Echinocactus monvillei*.

**G. reductum** Pf, is *Echinocactus gibbosus*.

**G. villosum** F, is *Echinocactus villosus*.

**Genus LEPISMIUM** Pfeiffer.

The published species, as far as known, are considered as synonyms of *Rhipsalis*.

**Genus LEUCHTENBERGIA** Fisch.

**LEUCHTENBERGIA PRINCIPIS** Fisch. Near Zimapan, Mexico.

**Genus LOPHOPHORA** Coulter.

**LOPHOPHORA WILLIAMSII** Coulter.

See *Echinocactus williamsii*.

**Genus MALACOCARPUS** Salm.

Nearly all the published species are considered as synonyms of *Echinocactus*, of the same specific names.

The identity of *M. Martini* Labour, (ex Foerster, Handb Cact ed 2, 1:454) and habit are unknown.

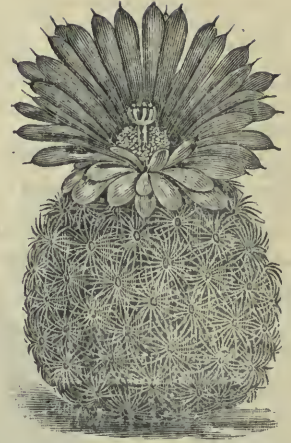
**Genus MAMMILLARIA** Haworth.

'Flowers about as long as wide; the tube campanulate or funnel-shaped. Ovary often hidden between the bases of the tubercles, as well as the exsert succulent berry, naked. Seeds yellowish-brown to black, exaluminous or nearly so. Embryo mostly short and straight, with extremely short cotyledons parallel to the sides of the seed.—Small, more or less globose or oval simple or cespitose plants, the spine-bearing areolae borne on cylindrical, oval, conic, or angular tubercles, which cover the body of the plant. Flowers form a distinct woolly or bristly areola at the base of these tubercles, fully open in sunlight, mostly only for a few hours.'—E.

Subgenus **COCHEMIEA**. Plants cylindrical, usually much elongated, with watery juice, and grooved tubercles. Flowers mostly in a ring near the vertex, several times longer than broad,



MAMMILLARIA MEIACANTHA Engelm.



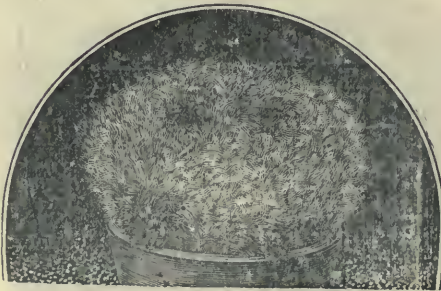
MAMMILLARIA PECTINATA Engelm.



MAMMILLARIA MACROMERIS Engelm.



MAMMILLARIA BOCASANA Poselg.



MAMMILLARIA LASIACANTHA Engelm.



MAMMILLARIA WRIGHTII Engelm.



scarlet, tubular, slender, somewhat curved, and oblique with spreading, unequal, petaloid sepals, so making the flower apparently double as in *Cereus flagelliformis*. Stamens and style red, exerted.

**MAMMILLARIA HALEI** Brandegee.

"Caespitose, stems 8-10, about a foot high, 2-3 inches in diameter, straight, covered with dark-colored straight spines; tubercles short, rounded, woolly in the axils; spines 15-25, ½ inch long, with 3-4 of the interior ones stouter and an inch long; flowers an inch long, vertical from the axils of young tubercles, scarlet; sepals all scarlet, petaloid; anthers scarlet, filaments exerted, yellowish, stigma scarlet; fruit red, clavate, ½ inch long; seeds smooth. A handsome species, seen only upon Magdalena and Santa Margarita Islands, where it is very abundant."—Brandegee *Calacprsr* 2:161, t. 6.

**MAMMILLARIA PONDII** Greene.

"From a few inches to a foot high, simple or with a few oval or cylindrically elongated branches; growing parts tomentose; radial spines 20-30, white, slender; central 4 or 5, the longest more than an inch in length, rigid and strongly hooked, dark brown above the middle; flowers nearly 2 inches long, bright scarlet. Near *M. Goodrii* Gill, and differing from it in its large size and brilliantly colored large flowers. The plants were in flower in February. The species comes from the southwestern part of Cedros Island."—Greene *Pittoria* 1:268 (20 Mr 1889).

Fruit 20 mm long, 10 m in greater diameter, greenish, base imbedded in wool, remains of flower persistent, pulp slightly acid, greenish (May 6, 1897); seeds 0.5 mm in diameter.

**MAMMILLARIA ROSEANA** Bndg.

"Stems numerous from the root, spreading, curved, ascending, one-third to 2 mm long, 4 cm thick; mamillae arranged in quincunxial order, 15 mm apart, cylindrical, 12 mm long, white-woolly in the upper axils; pulvinae finely pubescent; radial spines 9 in number, 8-12 mm long, brown or straw colored, the single central spine 25 mm long, curved, hooked at the tip; flowers from the axils of the upper mamillae, 3 cm long; sepals and petals bright scarlet, fitted into a tube, spreading at their tips, in several series; stamens and style scarlet; style branches 5-7; fruit scarlet, pyriform, 6-8 mm long; seeds black, pitted; cotyledons unfitted, only a depressed line at their tips; albumen none.—Throughout the lower elevations of the Cape Region and northward to Calmall. This cactus is one of the most showy of Lower California. Dr. Palmer collected it at La Paz and it is No. 139 of the list from that place in *Contr. U. S. Herb. No. 3*, catalogued by Mr. Pose, for whom it is appropriately named. The stems pendent from rocks at Comordu are sometimes 6 feet long. This species and *M. Halei* of Magdalena and Santa Margarita Islands have similar flowers, fruit and seeds. The seeds of *M. Halei* were wrongly described as smooth; they are pitted in the same manner as those of this species."—*Br Zoe* 2:19 (Ap 1891).

**MAMMILLARIA SENILIS** Lodd.

Stem columnar, 2 dm high, 5 cm diameter, profliferous at base in age, axils naked, brilliant green; areoles tomentose, tomentum & spines white; radials very numerous, flexible, criniform, 4-6 centurals stronger, the upper hooked. "Grows on palms, San Luis Potosi."

Variety **HASSELOFII** S [M hasselofii Eh].

Spines more numerous, all criniform.

Variety **LINKEI** S [M linkel Eb].

Central spines all hooked.

**MAMMILLARIA SETISPINA** E.

"Cactus setispinus: fasciculate and ascending, simple or branched at base, the stems about 10 cm high and 3-6 cm in diameter, densely covered with remarkably long stout spines: tubercles short and broadly conical, with axillary wool; spines white, with black tips; radials 10-12, widely spreading, very unequal, 10-34 mm long, slender and flexuous; central spines 1-4, more rigid and much longer (20.5 mm), the upper ones straight, the lowest one longest and hooked (usually upwards) and often variously curved and twisted; fruit obovate and scarlet, 30 mm long; seeds black and pitted. Type, Gabb 15 in *Herb. Mo. Bot. Gard.* Rocky or gravelly soil, San Julio canyon, and in the vicinity of San Borgia, Lower California."—Coulter *Cont U S Nat Hb* 3: 106 (10 Je 1894).

Subgenus **CORYPHANTHA**. Plants globose or elongated, often robust, with watery juice. Tubercles (in age) grooved on the upper side. Flowers as in *Eumammillaria*, but some at the extremity of the groove in the axils of young tubercles, usually near the vertex of the plant.

**MAMMILLARIA ALVERSONI** Hort.

The Fox-tail cactus is of robust branching habit, densely covered with long stout straight spines, usually tipped with black or black half way down, shading into red, but often pure ivory white throughout. The large rose purple flowers are quite showy. The largest of some fifty plants was a cluster of six heads measuring 3 inches in diameter and about 8 inches high.

See *radiosa*.

**MAMMILLARIA ARIZONICA** Engelm.

See *radiosa*.

**MAMMILLARIA COMPACTA** E.

Depressed-globose, 5-10 cm diam, simple; tubercles short-conical, crowded, 8 mm long; radials 13-16, rigid, recurved & appressed, interwoven with adjacent clusters, whitish or horny, 10-20 mm long; central erect, often wanting; fls 3-3.5 cm long and broad, yellow; fruit oval, green; seeds 1.4 mm long, smooth, yellow. Chihuahua.

**MAMMILLARIA CONOIDEA** P DC.

Ovate-conical, simple, 3.5-10 cm high, 4-7 in diameter below with densely woolly vertex; tubercles close, ovate, 12 mm long, axils at first woolly; radials 10-16, ashy to white, straight, stout, 6-10 mm long; centrals 3-5, 10-16 mm

long, the lower one more rigid, 15-20 mm long, brownish-black; fls deep purple, 2-3 cm long & wide. San Luis Potosi; Coahuila; Nuevo-Leon.

MAMMILLARIA CORNIFERA P DC.

MAMMILLARIA DASYACANTHA E.

Mammillaria echinus E. is radians.

MAMMILLARIA ELEPHANTIDENS Lem.

MAMMILLARIA MACROMERIS E.

MAMMILLARIA MISSOURIENSIS

Sweet hort Brit 171 [1827].

M simplex T-G Fl N Am 1:553 [1840].

M nuttallii E pl Fend 49 [1849].

M notesteinii Britton Torr cl b 18:367 [1891].

Cactus mamillaris Nutt Gen 1:295 [1818] non L.

Globose, 3.5 cm diam., simple; mammae ovate, 12-14 mm long, slightly grooved; radials 13-17, straight, whitish, unequal, setaceous, 8-10 mm long; central more robust, longer, puberulent, or wanting; fls 2.5 cm long, stigmas 2-5; fruit globose, scarlet, 6-8 mm diam., seeds globose, black, pitted, 1.1 mm diam. Montana, Kansas, Colorado, Nebraska, South Dakota.

Star Cactus; dwarf; flowers yellow or salmon color.

MAMMILLARIA NICKELSAE K Br.

"Soon and densely caespitose, glaucous and often purplish, 4-6 cm high, hemispherical or globose; tubercles 10-12 mm long, becoming quite as broad and unbricated; spines 14-18 all radial, slender, at first yellowish with darker tips, later all gray; lower spines 8-10 mm long, the upper one-third longer, stouter, extending into the groove and forming a fascicle, the clustered fascicles making an upright tuft at the vertex; flowers 5-7 cm in full expansion, said to be bright yellow with red center; fruit unknown. Southward from Laredo, Texas. Named for the collector, Mrs. Anna B. Nickels, and offered in catalogues as M. Nickelsii. Evidently closely related to M. sulcata Engelm."—Kather n Brandegee, Zoc, 5: 31 (ag 1900).

Mammillaria pectinata E. is radians.

M. POTTSII Scheer ex Salm HD ed 2, 04.

Cylindrical, 3-35 cm high, 2.5-3 diam, somewhat branching; tubercles ovate, obtuse, lightly grooved, axillary woolly, radials slender, white, very numerous, rigid; centrals 6-12, stouter; fls pinkish; scarlet, clavate fruit. Texas; Chihuahua; Durango.

Cactus pottsii OK rev gen pl 261; Coulter 113.

Mleona Pos AGZ 1853, 94:—"stelligere M. caule cylindraceo interdum prolifero diametro pollicari 4-5 poll. alto glauco, mamillis brevibus confertis; axillis lanatis, areolis nudis, aculeis exterioribus permultis intertexti-albidis, centralibus 8-12, exterioribus superantibus flavescens, summo subcurvato albo subpurpurascens." Nuevo Leon

MAMMILLARIA RADIANS P DC.

MAMMILLARIA RADIOSA E.

M. alversoni, arizonica, chloantha, deserti.

MAMMILLARIA RECURVATA E.

MAMMILLARIA STROBILIFORMIS Shr.

MAMMILLARIA SULCOLANATA Lem.

MAMMILLARIA VIVIPARA Haw.

Purple and white spines cover the en-

tire plant; flowers bright purple, 3.5 cm long and broader when fully expanded, showy. Montana, Nebraska, Colorado, Idaho, Washington and British America—consequently one of the most hardy species known.

MAMMILLARIA WISSMANNII Hildm.

Section G' ANDULIFERAE. Cylindrical; mammae cylindrical, long, or oval and more or less globose; grooves bearing more or less conspicuous glands, the grooves often absent in young plants, the glands sometimes in the axils or at the base of the tubercles.

MAMMILLARIA ASTERIAS Cels.

MAMMILLARIA BREVIMAMMA Zucc.

Near Zimipan. M xico.

MAMMILLARIA CLAVA Pf.

"Clavato-columnaris, intense viridis; axillis tomento denso albo et glandula simpliciteriella instructis, mox planissimis, nudis; mamillis elongatis erectis, dorso sulcatis, basi oblique tetragonis; areolis albo-villosis infraapicalibus; aculeis rectis, corneis, subaequalibus, radiantibus 7, centrali 1, paulo longiore, crassiore."—Pfr AGZ 1840, 282. Mexico—Fhrenberg.

Bot magt 4358 Otto & Dietr AGZ 1845, 234-5.

M dolichocentra Lem.

MAMMILLARIA DOLICHOCENTRA Lem

Two distinct species have been figured under this name by Foerster, Schumann, & Lem. Seeclava.

MAMMILLARIA ERECTA Lem.

MAMMILLARIA GLANDULIGERA

Otto ex Dietr AGZ 1848, 298:—"obovata, subglaucens axillis nudis; mamillis brevibus, pyramidatis, subteretibus, albidopunctatis, dorso glandulari roseo albo instructis; areolis subnudis; aculeis exterioribus stellatis dispositis numerosis flavescens demum albidis, centralibus ternis vel quaternis subulatis fuscis, unico patente, ceteris erectis. Mexico."

Is Ottonis fide KS.

MAMMILLARIA MACROTHELE Mart.

Near Zimipan, Mexico.

MAMMILLARIA OTTONIS Pf.

"Globosa simplex obscure griseo-virens; axillis fasciculo lanæ albidæ et glandula rubra tomento albo cincta instructis; mamillis crassis mammaeformibus, basi interdum confluentibus, dorso usque ad glandulam sulcatis; areolis junioribus albo-villosis; aculeis radiantibus 11-12 subaequalibus rigidis rectis, 2 summis gracillioribus suberectis, flavescens, apice fusc., tandem fusco-cinereis, centralibus 3 rariis 4, (summo plerumque deficiente) subdecussatis, rigidioribus, corneis, infimo longissimo patente recurvulo."—Pfr AGZ 1838, 274. Mineral del Monte, Mexico—Ehrenberg.

MAMMILLARIA SALMDYCKIANA

Scheer ex Salm HD ed 2, 134 [1850].

M Scheerii Muchpf AGZ 1947, 97, non 1845.

M robustipina Schott ex E.

M [Caetus] brownii Toumey bot gaz 2:253

See Orcutt rev 77-78 for descriptions; it is the name Scheerii here dropped for this race



plant of Sonora, New Mexico, Chihuahua, Texas and Arizona: the plants from San Luis Potosi is a distinct species.

**MAMMILLARIA SCHEERII** Muehlpf.

"Globosa multiplex: mammillis subglobosis superne sulcatis; aculeis radiantibus 20-22 albis adpressis subdistichis, centralibus 4 rectis fuscis, infimo valde elongato 8-10 lin. longo."—AGZ 1845, 346; 1846, 373, is polymorpha [conoidea].

See salmdyckiana.

Subgenus **DOLICHOTHELE** KS.

**MAMMILLARIA LONGIMAMMA** P. SC.

**MAMMILLARIA SPHAERICA** S.

Subgenus **LACTESCENTES**. Plants depressed-globose, rarely a little elongated; juice milky; tubercles usually angular and somewhat leathery. Flowers as in Eumamularia, but mostly small.

**MAMMILLARIA ANGULARIS** L.-O.

**MAMMILLARIA CAPUT-MEDUSAE** Ctto.

Near Zimipan, Mexico.

**M. DIACENTRA** Jacobi AGZ 1856, 91.

"Angulosa tetragona. Caule sphaerico, subumbilicato saturate viridi lactescente. Mammillis ad basin rhomboideis obvie pyramidatis apice late aliter applanatis; pulvillis ovalibus glab. fissis bapicalibus; axillis junioribus nudis, dein fuscose albo-lanatis, serius cuncto nudis. Setibus radialibus 5-6, diaphane albidis, apice subspatulatis serius ubique abidi- subulatis vix patulis, subans et inferne recurvulis radianter positis, 2 ant 3 superioribus brevissimis, 3 inferioribus altero tanto longioribus; aculeis centralibus 2, multo validioribus longioribusque, junioribus cinereo-bunneis apice nigris, dein curvo cinereis apice nigricansibus, superioribus erecto sensim recurvato, inferiore recte patente inferne recurvato, utroque earum basin semi terete, apice rotundato, inferiore ferè altero autum longiore. Flores parvulleribendi, tubo brevissimo, circa ovarium ventricose dilatato, superne concavato, petalis lanceolatis breviter recurvatis, roseis cum linea media purpurea. Stamina filamentosa roscia antheraeque sordide flavæ stylus staminibus longior rosens, stigmatibus 6 coloribus. Floret mensibus Julio."—Planta descripta altitudinetri pollicari diametroque poll. 3½. Aculeorum radialium 2 ant 3 superiorum lin. 1, cetera 3, lin. 2 longi; aculeorum centralium superiorum lin. 6-8 longis, inferiorum pollicari set utra."

**MAMMILLARIA FORMOSA** Scheidw.

**M. FUNKII** Scheidw AGZ 1841, 43.—

"Lactescens, robusta, umbilicata, laeve viridiss; axillis nudis, tandem criniferis; crinibus albis apice nigrescentibus ex mox unicoloribus; mammillis pyramidato-tetraedris; areolis infra axillis mammillarum immersis, nudis, junioribus vix tomentosis; aculeis 8 maxime inaequalibus, centrali longissimo incurvulo, nascentibus fuscis, tandem griseis. Truncus 3 poll 10 lin altus, diametro 6 pollicari; aculei exteriores ¼-2 in. longi, centralis ½-6 lin. longus."

Mexico.

**MAMMILLARIA GABBII** Engelm.

Cactus gabbii Coulter, U S Na Hb cont 310:—"Globose, 5-10 cm in diameter, sim-

ple, tubercles cylindrical, slender, 12-14 mm long, with woolly axils; radial spines about 13, 5-8 mm long, lower ones longer and stouter, especially the latest ones pectinate; the central shorter, straight and robust; flowers small, yellowish-red; fruit unknown.—Type in Herb. Mo. Bot. Gard. Among rocks, from San Ignacio to Mission San Fernando, Lower California."

Near San Quintin bay, Baja Cal. (Orcutt).

Cactus brandegei Coulter, U S Na Hb cont 376.

**MAMMILLARIA GEMINATA** Scheidw.

"Lactescens, truncus geminato; vertice umbilicato; axillis lanatis; mammillis tetragono-polyedris, viridibus; areolis junioribus lanatis, dein nudis; aculeis exterioribus 6 rectis, stellatis, apice nigrescentibus; centrali 1 validiore curvula nigro. Mammilae 4 lin. longae; aculei exteriores 2½ lin. longi centralis longitudine 3 lin."—AGZ 1841, 42. 5000 ft alt near Oaxaca, Mex.

**MAMMILLARIA GIGANTEA** Hildm.

**MAMMILLARIA GUMMIFERA** E.

**MAMMILLARIA HEESEANA** Mac Dow.

**MAMMILLARIA HEYDERI** Muehlenpf.

"Globosa, viridis, vertice impresso, axillis junioribus lanatis, mammillis conicis, elongatis, 6 lineas longis, 3 lineas latae, areolis junioribus albo-tomentosis apice mammillarum dispositis; aculeis radiantibus 20-22 albis setaceis, inferioribus robustioribus paululum elongato, centrali 1, erecto corneo basi apiceque fusco 2½-3 lineas longo."—Muehlenpf AGZ 1848, 20. Texas.

Reel Gartenflora 1889, 52, f.

Scheele. Roem Texas, 435 (1849).

**M. KRAMERI** Muehlpf AGZ 1815, 347:

"Globosa, basi tandem prolifera: axillis lanatis; mammillis angulosis pyramidalis, junioribus lanatis; aculeis exterioribus 4-5 rigidis, centrali 1 elongato 1½-2 poll. longo, omnibus albis apice nigris Die pflanze ist aus Mexico, und erhielt ich dieselbe vom Kramer in Hamburg, unter den Namen M. macrantha."

Range sent under this name from San Luis Potosi, which bore flowers ¼ inch long, ½ inch across, 12 maroon purple sepals, 16 white petals with maroon midvein; 6 stigmata, style, filaments and anthers white

M Schmidtii (schmittii) Ske.

**M. LEUCOTRICA** Scheidw AGZ 1840, 338:

"M. lactescens, simplex vel caespitosa, cylindrica, vertice umbilicato; mammillis pyramidalis quadrangularibus; axillis primo nudis, tandem lana abundant; aculeis ciliiformibus, albis munitis; areolis rotundis lana alba instructis; aculeis exterioribus 6, centrali 1, omnibus rigidis subaequalibus fuscis, tandem carneis apice sphaelatis. Fructus pyriformis; flores adhuc ignoti." Mexico.

Jacobi AGZ 1841, 11

See maschalacantha.

- M. MASCHALACANTHA Cels.  
 M. mutabilis laevior Salm, HD ed 2, 120.  
 Cactus mutabilis OK  
 M. leucotricha (leucocarpa) Scheidw.  
 Variety LEUCOTRICHA Monv.  
 M. mutabilis et funkii Schdw.  
 M. Senkei Foerst.  
 Variety XANTHOTRICHA Monv.  
 M. xanthotricha Schdp. Cactus xanthotrichus OK. M mutabilis xanthotricha S.  
 M PALLESCENS Scheidw AGZ 1841, 42.  
 "Lactescens, cylindrica aut ovata; vertice umbilicato subacu eis abscondito; axillis maxime lanatis, lana aculeis adherente et mammillis involvente; areolis tomentosus, tandem nudis; mammillis polyaedris, laete viridibus, mox pallescentibus; aculeis 4 cruciatim dispositis, angulatis, recurvis, supremo maximo subtorto, omnibus rigidis, carneis." 5500 ft alt Tehuacan.  
 MAMMILLARIA MELACANTHA E.  
 MAMMILLARIA SEMPERVIVI P DC.  
 Near Zimipan, Mexico.  
 MAMMILLARIA TROHARTII Hilldm.  
 MAMMILLARIA UNCINATA Zucc.  
 Schumann includes the following in this group, but as known to us all are not milky.  
 M. CELSIANA Lem.  
 M. PRAELII Muehlenpf.  
 M. PYRRHOCEPHALA Scheidw.  
 M. ZEYERIANA F Haage jr.  
 M. CENTRICIRCHA Lemaire.  
 M. CROCIADIATA Lemaire.  
 M. KARWINSKIANA Mart.  
 MAMMILLARIA BICOLOR Lehm.  
 Near Zimipan, Mexico.  
 Variety NIVEA KS.  
 MAMMILLARIA CARNEA Zucc.  
 Near Zimipan, Mexico.  
 MAMMILLARIA ELEGANS DC.  
 MAMMILLARIA LAVOVIRENS S.  
 MAMMILLARIA HAAGEANA Pf.  
 MAMMILLARIA MELALEUCA Karw.  
 MAMMILLARIA MELANOCENTRA Pos.  
 MAMMILLARIA MUTABILIS Scheidw.  
 MAMMILLARIA NIVOSA Link.  
 MAMMILLARIA OBSCURA Hilldm.  
 MAMMILLARIA PARKINSONII Eh.  
 MAMMILLARIA PERBELLA Hilldm.  
 MAMMILLARIA PHYMATOTHELE Berg.  
 MAMMILLARIA POLYEDRA Mart.  
 MAMMILLARIA SEITZIANA Mart.  
 Near Zimipan, Mexico.  
 MAMMILLARIA SIMPLEX Haw.

Subgenus EUMAMILLARIA. Plants globose or elongated, with watery juice, and cylindrical or conical grooveless tubercles. Flowers borne usually in a ring near the top of the plant, cup-shaped or

expanded, as broad or broader than long. Sepals appressed. Stamens and styles shorter than the corolla.

- MAMMILLARIA ACICULARIS Lem.  
 MAMMILLARIA ANTINOPLEA Eh.  
 MAMMILLARIA ALPINA Mart.  
 MAMMILLARIA AMABILIS Eh.  
 MAMMILLARIA AMBIGUA G. Don.  
 MAMMILLARIA AMOENA Hopff.  
 MAMMILLARIA ANCISTRATA Sehelh.  
 MAMMILLARIA ANCISTRIA Walp.  
 MAMMILLARIA ANDREAE Pf.  
 MAMMILLARIA ARGENTEA Fenn.  
 MAMMILLARIA ARICINA Lem.  
 MAMMILLARIA ARMILLATA K Br.  
 "Stems somewhat attenuate, reaching 3 dm in height, 4-5 cm in diameter, usually in clusters of 3-12, from the base, often branching above; tubercles somewhat leathery in texture; conical, somewhat angled; axils setose and sparsely woolly; radial spines 9-15, 7-12 mm long, the inner half whitish or grayish; centrals 1-4, 10-20 mm long, the lower one hooked and longer, all, and the outer part of the radials dark brown, yellowish or gray; flowers 1-2 cm long, scarcely spreading, flesh color; fruit red, clavate, 1½-3 cm long; seeds coriaceous, dull black, about 1 mm long, obliquely obovate, constricted above the more slender basal portion; surface covered with minute, not closely contiguous pits, the intervening spaces minutely wrinkled; hilum basal, narrow. San Jose del Cabo, Baja California. The name is in allusion to the dark bands which encircle the plant, giving it much the appearance of a raccoon's tail."—Katharine Brandegee, Zoe, 5:7 (Je 1900).  
 MAMMILLARIA ATORUBRA Eh.  
 MAMMILLARIA ATROSANGUINEA Eh.  
 MAMMILLARIA AULACANTHA P DC.  
 MAMMILLARIA BADISPINA F.  
 MAMMILLARIA BARBATA Engelm.  
 MAMMILLARIA BARLOWII R-K.  
 MAMMILLARIA BELLATULA F.  
 MAMMILLARIA BERGENII Eh.  
 MAMMILLARIA BERGHII Mig.  
 MAMMILLARIA BIFURCA Dietr.  
 MAMMILLARIA BINOPSIS Hge.  
 MAMMILLARIA BOCASANA Pos.  
 This beautiful plant is covered with the finest tender hair like spines.  
 Near San Luis Potosi, Mexico.  
 MAMMILLARIA CANDIDA Scheidw.  
 MAMMILLARIA CARRETII Rebut.  
 Is Pringlei.  
 MAMMILLARIA CONICA Haw.  
 MAMMILLARIA DECIPIENS Schw.

Loose tubercled small growing species with delicate & pretty yellow fls.

- MAMMILLARIA DIOICA K. Brandg.  
 M. Goodridgii Engelmann (not Scheer?). small globular species, closely set with brownish or white spines, the central one curved



into a hook. The delicate yellowish white flowers are succeeded by the club-shaped, scarlet berries that possess the flavor of wild-wood strawberries, and are sometimes called "hep-pitallas," the "llavina" of the Mexicans.

**MAMMILLARIA ELONGATA** P DC.

**MAMMILLARIA FLAVA** E.

**MAMMILLARIA FORDII** Orcutt.

Ovate, 2 inches in diameter, and about 3 high, rarely branching at base; tubercles obtuse,  $\frac{1}{4}$  inch across, short, 12 radial spines either  $\frac{1}{2}$  or  $\frac{3}{4}$  inch long, the solitary central black and hooked,  $\frac{1}{4}$  inch long; flower an inch long, white with about 9 petals and 9 sepals—the latter with purplish midvein on the back, 6 stigmata of a brownish green style greenish, filaments white and anthers orange yellow; flowers in July; Baja California on the west coast, collected for L. M. Ford, 1899. Near M. Goodridgii.

**MAMMILLARIA GLOCHIDIATA** Mart.

**MAMMILLARIA GOODRIDGII** Scheer.

**MAMMILLARIA GRACILIS** Ff.

**MAMMILLARIA GRAHAMII** E.

1 to 3 inches high, subglobose, simple or branching from the base; tubercles ovate, axils naked; radial spines in one series, 20 to 30 in number, 3 to 6 lines long, rigid and whitish, surrounding a stouter and longer hooked brown one. Flowers small, nearly 1 inch wide, reddish; berry oval, green, with small pitted seeds. The well-known "Arizona Strawberry" or small Fishhook Cactus of N. M., Arizona and Utah, rare in California.

**MAMMILLARIA GRASUNII** Runge.

**MAMMILLARIA HUMBOLDTII** Eh.

**MAMMILLARIA INCURVA** Scheidw.

**MAMMILLARIA INTRICATA** Otto.

**MAMMILLARIA LASIACANTHA** E.

Variety **DENDRATA** Engelmann.

Mammillaria kona Pos, is Potts f.

**MAMMILLARIA LESAUNERI** Rebut.

**MAMMILLARIA MAELENII** S.

**MAMMILLARIA MAELENII** S.

**MAMMILLARIA MAINAE** Dr.

Spherical to ovate, simple, or sparingly branched from the base, reaching a height of 10 cm; tubercles glaucous, somewhat incurved, cylindrical, becoming conical, 1-1 $\frac{1}{2}$  cm long, often bright red in the naked axils, radial spines, 10-15, yellowish, becoming white, slender, scarcely pungent, 6-10 mm long, the upper rather the shorter; centrals 1-2, both hooked, rarely an additional upper one; lower central, usually the only one, nearly twice as long as the radials, stout and strongly hooked, porrect, brown below, blackish above, somewhat twisted; the second central when present, widely divaricate, ascending, weaker and shorter; flowers in crown at upper part of stem, pinkish-white or flesh-color, 1-1 $\frac{1}{2}$  cm in length, including the ovary; style whitish, deeply, few-lobed; fruit red, globular, to obovate, shorter than the tubercles; seeds dull-black, punctate, a little more than 1 mm long, obovate, with narrowly-linear basal hilum. Named for the collector, Mrs. F. M. Main, who found it in Sonora, south of Nogales. It has been

offered by dealers as *M. Galeoteii* Scheid, to which it is not at all related.—Katherine Brandegee, Zoe 5 1 (ag 1900 ).?

**MAMMILLARIA MICROMERIS** E.

mushroom cactus, found in Texas, resembles a silk-covered button, and can be handled without gloves. The delicate, starry net-work of snowy-white spines over the green plant gives it a very beautiful appearance.

Variety **GREGGII** Engelmann.

**MAMMILLARIA MINIMA** R. Ichb.

Mexican species, cylindrical, forming numerous heads around the base, which readily take root when detached. About 20 slender white spines radiate from the center of each hemispherical tubercle, enveloping the plant like a bit of delicate lace; no central spine.

**MAMMILLARIA NICHOLSONII** Mac Dow.

*Mammillaria nogaensis* Runge cat, is *recurvata* E.

**MAMMILLARIA OLIVIAE** Orcutt.

Globose to ovate, 2 $\frac{1}{2}$  inches in diameter, 3 inches high, simple or rarely branched or cespitose; tubercles ovate,  $\frac{1}{4}$  inch long, axils naked; radials 25-36, snowy white, slender, rigid,  $\frac{1}{4}$  inch long, upper ones shorter; centrals 1-3, the lower one only an eighth of an inch long, erect, rigid, white or tipped with chocolate brown; the two upper centrals slender white or rarely tipped with brown, 3 times as long, closely resembling the radials; lower central rarely longer, but occasionally even  $\frac{1}{2}$  inch long, slender or flexuous, brownish and hooked upward—more frequently seen on the lower outer tubercles of young plants; fruit scarlet, clavate, with small seeds. Type, Orcutt, No. 2902.—Of snowy whiteness from its numerous interlacing spines; dedicated to the author's life partner, who has accompanied him in thought on the mountains and deserts of Arizona, where this beautiful plant occurs.

*Mammillaria petersonii* Hldm, is *Heesiana*

*Mammillaria psiffieri* Booth, is *rhodantha*.

**MAMMILLARIA PHELLOSPERMA** E.

**MAMMILLARIA PLUMOSA** Web.

**MAMMILLARIA PRINGLEI** K Br

Katherine Brandegee Zee, 5:7, publishes this name (based on *Cactus Pringlei* Coulter), and states that it seems to scarcely differ from *M. Carrettii*.

**MAMMILLARIA PUSILLA** Sweet.

**MAMMILLARIA RHODANTHA** L-O.

Oblong or subcylindrical, 30 cm high, 7.5-10 in diameter, often bifurcate; tubercles conical, 12 mm long, 8 in diameter; with woolly axils; radial spines 16-20, bristle-like, white, the lower 8-10 mm long; central spines 6 or 7, rigid, whitish with black tip, 12 mm long; flowers rose-color, 12 mm broad; fruit 2.5 cm long, cylindrical. Mexico.

**MAMMILLARIA SPHACELATA** Mart.

**MAMMILLARIA SPINAUREA** S.

**MAMMILLARIA SPINOSSIMA** Lem.

**MAMMILLARIA STELLA-AURATA** Mt.

**MAMMILLARIA THORNBERI** Orcutt.

Cylindrical,  $\frac{1}{4}$  inch in diameter, usually 2-3 inches high, erect, with 8 or 9 spiral rows of tubercles, axils naked; 13-18 slender white or brown tipped radials  $\frac{1}{4}$  inch long; usually 1 slender flexuous hooked central one-fourth to three-fourths of an inch long, tipped with brown; fruit clavate, scarlet, containing minute black seeds. Tips of tubercles olive green, base and axils and sunken portion of plant tinged with purple; radials usually 13, the upper sometimes the longest, often brown nearly to the base; central occasionally brown, usually the lower half white or yellowish, often hooked upward, but often twisted and turning in every direction. Plant proliferous at base, forming numerous offsets in the axils of the buried or lower tubercles; these quickly take root and usually soon sever connection with the parent, thus forming dense compact masses of old and young plants, usually 10-50—but in one, perhaps not exceptional case, I counted 110 distinct plants, in a cluster—all apparently originating from the tallest individual in the group. Occasionally a plant, from injuries sustained, becomes bifurcate or forms a number of aerial heads which remain permanently attached—but which usually form roots of their own and eventually survive the death of the parent. More than 1 central spine appears very rare, but 2 or three sometimes appear from the same small woolly areola, one or all hooked, of equal or varying length. The largest plant among over 1,000 was  $1\frac{1}{2}$  inch in diameter and nearly a foot high! Type, Orcutt, No. 2533.—Arizona. Curiously the same plant was found a few days earlier than by the author by Prof. J. J. Thornber, and planted in the cactus garden of the University of Arizona, and this interesting addition to the cactus flora of the United States may therefore appropriately bear his name.

**MAMMILLARIA TOALDOAE** Lehm.**MAMMILLARIA UMBRINA** Eh.**MAMMILLARIA VALIDA** Web.**MAMMILLARIA VENUSTA** K Br.

"Simple, becoming caespitose in clusters of, in extreme cases, as many as 40; heads 2-4, very rarely, in center of large clusters, 6 cm high, a little less in diameter; tubercles thick and short, concave at the end, greenish, purplish to nearly white, glaucous; axils only slightly woolly, soon marked; radial spines, 9-15, stout, 6-12 mm long; centrals typically solitary, 10-15 mm, sometimes 2 or 3, in a single specimen 4, prorect-spreading, the 3 upper very short; flowers about 4 cm in diameter, rose-color, widely spreading, tube very short; petals lanceolate acute, recurved-spreading; style-branches 5, apparently rosy brown; fruit  $1\frac{1}{2}$ -12 cm long, scarlet, linear, circumscissile some distance above the base, nearly dry; seeds oblong-obovate, rather less than one mm long, constricted above the basal portion, which is half as long and nearly as wide as the upper; surface dull, minutely pitted, the pits much obscured by delicate intervening striae; hilum basal, large and triangular.

"Collected by Mr. T. S. Brandegee in the vicinity of San Jose del Cabo, Baja California, in Sept. 1890. (No. 240, M. Goodrichii, in 'Flora of the Cape Region'); again Sept. 1893, and for the third time last year in numerous living specimens. The spines are from pure white, barely tipped with brown, to dark brown, whitish only near the base. The flowers, which appear in September, hide the whole plant, and it is of such low growth as to look like a beautiful cluster of flowers springing from the sand. The fruit appearing in winter is nearly dry and falls very readily when ripe, leaving most of the seeds in the axillary cup. It is the only circumscissile Mammillaria known to me."—Katherine Brandegee, Zoe, 5:8 (Je 1900).

**MAMMILLARIA VETULA** Mart.**MAMMILLARIA WILCOXI** Tourmey.

Usually simple, depressed-globose; 14-16 slender, subulate whitish radials 10 mm long; solitary hooked central brownish; axils naked. Fruit (16 O 1896) flesh color faintly tinged with carmine, the black seeds showing through the transparent epidermis. Near Congress and Benson, Arizona (Orcutt).

**MAMMILLARIA WILDII** Dietr.**MAMMILLARIA WRIGHTII** E.**MAMMILLARIA ZEPHYRANTHOIDES** Scheldw.

Mamillopsis senilis Web, is Mammillaria senilis Lodd.

**Genus MELOCACTUS** De Candolle.

Globose fleshy plants 1-3 feet in diameter, regularly ribbed, ribs bearing clusters of spines, surmounted with a woolly cylindrical cap closely set with softer spines, upon which the small tubular red or rose-colored flowers are borne. Of little value horticulturally and rarely cultivated with success. Generally found in rocky or sandy dry situations in tropical America and West Indies.

**MELOCACTUS VIRIDESCENS** Nutt.

Nuttall ex Teschem in J Bost Soc Nat Hist 5:293 (1845).—A synonym of Echinocactus viridescens.

The Melocacti are natives of the West Indies, and tropical America.

**Genus MYRTILLOCACTUS** Console.**MYRTILLOCACTUS GEOMETRIZANS** C

Cereus geometrizans Mart.

Cereus cochal Orcutt.

**Genus PELECYPHORA** Ehrenb.**PELECYPHORA ASELLIFORMIS** Ehrenb.

The Hatchet cactus is a little gem from Mexico, so-called from the shape of the tubercles. It bloomed in San Diego on May day, scarce  $\frac{1}{2}$  inch in length and breadth, with thirteen bright magenta colored petals and seven or eight pale lavender sepals, the four stigmata white, style and filaments tinged with purple, and anthers bright orange. The largest plant



among a hundred is but little over an inch in height and diameter, and in earlier days they were literally worth their weight in gold. The flowers are open only in sunlight.

Variety PECTINATA KS.

**Genus PHYLLOCACTUS Link.**

Epiphytal plants with spineless flattened leaf-like branches, with a prominent midrib, mostly with large showy flowers, from creamy white to the richest crimson and scarlet, produced from notches in the margins of the stems.

Readily produced by cuttings or seeds, the phyllocacti are established favorites, and hundreds of varieties have been produced by hybridization. Young growth often cylindrical, then triangular, finally assuming the flattened form.

**PHYLLOCACTUS ACKERMANNI Walp.**

The King cactus was taken from Mexico to England prior to 1829 by George Ackermann, and bears the most gorgeous flowers, 6 to 8 inches in diameter, the acutely pointed, wavy petals of a deep brilliant crimson, bordered at the base with bright magenta, the interior decorated with a mass of white filaments and antlers, the 11 stigmata and style also white. The plant blooms freely and may be seen in many San Diego gardens. The plant before me is about a foot high and bears one open flower and three buds today (May 3, 1900).

**PHYLLOCACTUS ACUMINATUS KS.**

State of Rio de Janeiro, Brazil.

**PHYLLOCACTUS ANGULIGER Lem.**

**PHYLLOCACTUS BIFORMIS Lab.**  
Honduras, Central America.

**PHYLLOCACTUS CRENATUS Walp.**  
Honduras, Central America.

**PHYLLOCACTUS HOOKERI S.**

**PHYLLOCACTUS KAMPMANNI Hort.**

Kampmann's Case-knife cactus is a less robust plant than the King cactus, and the flowers are only about 3 inches in diameter, the petals broader in proportion, of a bright, but lighter, crimson. Filaments white, antlers canary yellow. This is a general favorite in San Diego gardens, also, producing its lovely flowers in the greatest profusion.

**PHYLLOCACTUS LATIFRONS Walp.**

The Queen cactus is quite the giant among the Phyllocacti, the stout flattened stems 4 to 5 inches broad, deeply crenated and commonly 8 to 10 feet high. The flowers are 7 to 8 inches long, about 6 inches in diameter, the petals of a delicate, clear, creamy white, the

sepals and tube of a reddish hue. Native of Mexico.

**PHYLLOCACTUS PHYLLANTHOIDES Link.**

**PHYLLOCACTUS PHYLLANTHUS Link.**

**PHYLLOCACTUS RUSSELLIANUS S.**

**PHYLLOCACTUS STENOPETALUS S.**

**PHYLLOCACTUS STRICTUS Lem.**

**PHYLLOCACTUS THOMASIANUS KS.**

**PHYLLOCACTUS WRAYI Hort.**

**Genus PILOCEREUS Lemaire.**

Included under the genus *Cereus*.

**Tribe OPUNTIEAE.**

Calyx tube not extending beyond the ovary; stems branched and jointed.

**Genus HARIOTA Adans.**

Adans Fam 2:243 (1763).

This genus is generally treated as a synonym of *Rhipsalis*, to which we refer all the species. Schumann maintains the genus as defined by De Candolle.

*H. alternata* Lem Hort Univ i t 50, is *R. paradoxa*.

*H. cassytha* Cels ex Foerst Handb 458, is *R. cassytha*.

*H. cribrata* Lem III Hort iv Misc 12 (1857), is *R. saglionis*?

*H. floccosa* Cels, ex Foerst Handb 458, is *R. floccosa*.

*H. funalis* Cels, ex Foerst Handb 457, is *R. funalis*.

*H. mesembrianthemoides* Lem Cact Aliq Nov Desc 39, is *R. mesembrianthemoides*.

*H. pentaptera* Lem ex Foerst Handb 453, is *R. pentaptera*.

*H. prismatica* Lem III Hort x Misc 84 (1863), is *R. tetragona*?

*H. saglionis* Lem Cact Aliq Nov Desc 39, is *R. saglionis*.

**HARIOTA SALICORNIOIDES DC.**

*Rhipsalis salicornioides* Haworth, of Brazil.

Variety BAMBUSOIDES Weber.

**HARIOTA VILLIGERA KS.**

KS Fl Br 266: S Paulo, Brazil.

*H. clavata* Web U S, is *R. clavata*.

**Genus RHIPSALIS Gaertn.**

**RHIPSALIS CASSYTHA Gaertn.**

**RHIPSALIS SALICORNIOIDES Haw.**

*Schlumbergera epiphylloides* Lem, is *Phyllocactus russellianus*.

*Stromatocactus Kotschubeyi* Karw, is *Anhalonium sulcatum* S.

*Tephrocactus andicolus* Lem, is *Opuntia andicola*.

*Tephrocactus aoracanthus* Lem, is *Opuntia andicola* Pf.

*Tephrocactus diadematus* Lem, is *Opuntia diademata*.

*Tephrocactus platyacanthus* Lem, is *Opuntia platyacantha*.

*Zygocactus Altenstemii* KS, is *Epiphyllum truncatum* fide KS.

**Genus PFEIFFERA Salm.**

**PFEIFFERA CEREIFORMIS Salm.**

A synonym of *Rhipsalis cereiformis*.

Genus MAIHUENIA Phil.  
M. POEPPIGII Weber.  
M. BRACHYDELPHYS KS.  
M. PHILIPPII Weber.

**PTEROCACTUS KUNTZEI KS.**

*Rebutia minuscula* KS, is *Echinocactus minusculus*.

Genus PERESKIA Plum.

**PERESKIA ACULEATA Mill.**

The Barbadoes gooseberry or Blad-apple; the leaves resemble those of the orange; much used for grafting purposes. West Indies.

**PERESKIA BLEO P DC.**

**PERESKIA LYCHNIDIFLORA P DC.**

**PERESKIA PANAMENSIS Web.**

**PERESKIA TAMPICANA Web.**

Genus NOPALEA Salm.

Erect, branching plants, with flattened elongated joints; flowers red or crimson, petals erect and slightly approaching each other at the apex, stamens longer than the corolla.

**NOPALEA AUBERI Salm-Dyck.**

Cuba; rapid growth; arborescent in form, and bearing numerous rose-colored flowers with exsert stamens; the branches armed with stout spines; readily grown from cuttings.

**NOPALEA COCCINELLIFERA Salm.**

The cochineal cactus, a native of Mexico.

**NOPALEA DEJECTA Salm.**

Salm-Dyck, Hort Dyck ed 2, 64, 233. Cuba.

**NOPALEA KARWINSKIANA S.**

**NOPALEA MONILIFORMIS KS.**

Genus OPUNTIA Tournefort.

"Tube of the flower very short, cup-shaped; petals spreading or rarely erect; ovary with bristle-bearing areolae in the axils of small terete deciduous sepals; berry succulent or sometimes dry, marked with bristly or spiny areolae, truncate with a wide umbilicus; seeds large, white, compressed, with the embryo coiled round the albumen; cotyledons large, foliaceous.—Articulated, much-branched plants, of various shapes, low and prostrate or erect and shrub-like; young branches with small terete subulate early deciduous leaves, and in their axils an areola with numerous short easily detached bristles, and, usually, stouter spines, all barbed. Flowers on the joints of the previous year, on the same areolae with the spines, mostly large, open only in sunlight. Fruit often edible, often large."—E.

*Opuntia auberi* Pf, is *Nopalea auberi*.

*Opuntia camuessa* Web, is *robusta*.

*Opuntia decumana* Gris, is *monacantha*.

*Opuntia flavicans* Lem, is *robusta*.

*Opuntia maxima* Hort (non Web), is *robusta*.

*Opuntia stenopetala* E, is *glaucescens*.

Subgenus CYLINDROPUNTIA E.—  
"Joints cylindrical, more or less tubercu-

lated; rhaps usually not prominent, therefore seed not margined; embryo forming less than one circle around the more copious albumen; cotyledons inconstant, contrary, oblique, or parallel to the sides of the seed."—E.

**OPUNTIA ACANTHOCARPA E. & B.**

"Arborescens; ramis alternis adscendentibus; articulis cylindricis; tuberculis elongatis; aculeis 8-25 stellato-divaricatis; bacca subglobosa tuberculata aculeata; seminibus multangularis. Mountains of Cactus Pass, between Santa Fe and the western Colorado. Stems 5-6° high; branches few, alternate, and separating from the stem at an acute angle. Joints as in [*O. arborescens*] 4-6 or 8' long, about an inch in diameter; tubercles 9-19 lines long; interior spines 1-1¼', exterior ones 4-10 lines long. Spines of fruit on the depressed tubercles 3-6 lin. long. Seeds large, unlike those of any other *Opuntia* seen by me."—E syn 308.

*O. californica* E Emory's rep 157 f 11.

**OPUNTIA ALCAHES Web.**

**OPUNTIA ANDICOLA Pfeiffer.**

**OPUNTIA AORACANTHA Lem.**

**OPUNTIA ARBORESCENS Engelm.**

"Caule ligneo erecto, ramis horizontalibus, ramulis cylindricis, tuberculatis aculeatissimis; areolis oblongis, brevissime tomentosus, aculeos 12-30 corneos stramineo-vaginato teretes undique porrectos gerentibus; ramulis versus apicem floriferis; ovario tuberculato, tuberculis sub-20 apice sepala subulata et areolas tomentosas cum setis paucis albidis gerentibus; sepalis interioribus 10-13 obovatis; petalis obovatis, obtusis s. e marginatis; stigmatibus sub-8 patulis; bacca flavo-sicca, ovato-globosa, tuberculata, profunde umbilicata. Mountains of New Mexico to Chihuahua, Parras and Saltillo; flowers in May and June; fruit, at least about Santa Fe, ripening the 2nd year (Fendler); in the north 5-10, south 20 and more feet high, 5-10' in diam, last branches 2-4' long; spines of the specimens on Waggon-mound 20-30 in each bunch; further south only 12-20, gener-



ally fewer on the under side of the branchlets; spines horn-colored, with straw-colored loose sheaths, from 3-10 lines, generally about 6 lines long. Flowers purple, 3' in diam; stamens red; fruit about 1' long, yellow.

'On Waggon-mound the first (flowerless) specimens of a strange *Opuntia* were found, with an erect, ligneous stem, and cylindrical, horridly spinous horizontal branches. The plant was here only 5 ft high, but grows about Santa Fe to the height of 8 or 10 ft, and continues to be found as far as Chihuahua and Parras. In the latter more favorable climate it grows to be a tree of 20 or 30, and perhaps even 40 feet high, as Dr. Wislizenus informs me, and offers a most beautiful aspect when covered with its large red flowers. It is evidently the plant which Torrey and James doubtfully, though incorrectly, refer to *Cactus Bleo* HBK. It is nearly allied to *Opuntia furiosa*, Willd. but well distinguished from it; \* \* \* the tree cactus, or *Foconoztle*, as called by the Mexicans, according to Dr. Gregg. The stems of the dead plant present a most singular appearance; the soft parts having rotted away, a net-work of woody fibres remains, forming a hollow tube, with very regular rhombic meshes, which correspond with the tubercles of the living plant."—E Wislizenus' report, 90.

OPUNTIA ARBUSCULA E.  
OPUNTIA AUSTRALIS Web.  
OPUNTIA BERNARDINA Engelm.  
OPUNTIA BIGELOVII Engelm.

"*Ramis erectis ascendentes; articulis ovato-cylindricis pallide virescentibus congestis; tuberculis subhemisphaericis depressis confertis: aculeis 6-10 robustioribus et totidem gracilioribus inferioribus; ovario tuberculato; bacca tuberculata subinda (sterili!) aculeolata; seminibus parvis.*

"On William's river of the Californian Colorado. Stem 3-4' thick and 10-12 ft

high, the branches forming a dense contracted head, with joints 2-6' long; tubercles 3-4 lines long; larger spines are about 1' long, smaller ones 4-7 lines long."—E Am ac pr 3:307.

OPUNTIA BRACHYARTHRA E. & B.  
OPUNTIA BULBISPINA E.  
OPUNTIA CEREFORMIS Web.  
OPUNTIA CHOLLA Web.  
OPUNTIA CIRIBE E.  
OPUNTIA CLAVARIOIDES L-O.  
OPUNTIA CLAVATA E.  
OPUNTIA CORRUGATA S.  
OPUNTIA CURASSAVICA Mill.  
OPUNTIA CYLINDRICA DC.  
OPUNTIA DARWINII Hensl.  
OPUNTIA DAVISII E. & B.  
OPUNTIA DIADEMATA Lem.  
OPUNTIA ECHINOCARPA E. & B.  
OPUNTIA EMORYI Engelm.  
OPUNTIA FLOCCOSA S.  
OPUNTIA FRAGILIS Haw.  
OPUNTIA FULGIDA Engelm.  
OPUNTIA GEISSEI R A Phil.  
OPUNTIA GRAHAMII Engelm.  
OPUNTIA GRATA R A Phil.  
OPUNTIA IMBRICATA P DC.  
OPUNTIA INVICTA Brandege.  
OPUNTIA KLEINIAE P DC.  
OPUNTIA LEONINA H-S.  
OPUNTIA LEPTOCAULIS D C.  
OPUNTIA LURIDA Hort.  
OPUNTIA MAMILLATA Schct.  
OPUNTIA MIQUELII Monv.  
OPUNTIA MOLESTA Brandege.  
OPUNTIA NIGRISPINA KS.  
OPUNTIA OVATA P.  
OPUNTIA PARISHII Orcutt.  
OPUNTIA PARRYI E.  
OPUNTIA PENTLANDII S.  
OPUNTIA PLATYACANTHA S.  
OPUNTIA PROLIFERA Engelm.  
OPUNTIA PULCHELLA E.  
OPUNTIA PYCNACANTHA E.  
Opuntia ramosissima E, is tessellata.  
OPUNTIA ROSEA DC.  
OPUNTIA ROSIFLORA KS.  
OPUNTIA ROTUNDIFOLIA KS.  
OPUNTIA SALMIANA Parm.  
OPUNTIA SCHICKENDANTZII Web.  
OPUNTIA SCHOTTII E.  
OPUNTIA SERPENTINA Engelm.  
OPUNTIA SPERGAZZINII Web.  
OPUNTIA SPINOSISSIMA Mill.  
OPUNTIA STAPELIAE P DC.  
OPUNTIA SUBULATA Engelm.  
OPUNTIA TARAPACANA R A Phil.  
OPUNTIA TERES Cels.  
OPUNTIA TESAJO Engelm.  
"With very short woody stem, and growing in little clumps 3 dm or less in diameter; joints slender and not distinctly tuberculate; flowers simple, bell-shaped, yellow. Type, Gabb 26 in hb Mo bot gard. 'Among rocks, especially toward the west coast and in the more central portions', Lower California."—Coulter, Cont Na hb 3-448.  
OPUNTIA TESSELLATA Engelm.  
OPUNTIA THURBERI E.  
OPUNTIA TUNICATA L-O.  
OPUNTIA VERSCHAFFELTII Cels.  
OPUNTIA VERSICOLOR E.  
OPUNTIA VESTITA S.

## OPUNTIA WHIPPLEI E. &amp; B.

OPUNTIA TETRACANTHA Toumey.

§ *ylindropuntia*. "An irregularly branching shrub 6-15 dm high; primary branches erect or ascending from a stout woody trunk 5-8 cm in diameter, and bearing numerous short, lateral branches at irregular intervals; ultimate branches 12-15 mm in diameter; joints cylindrical, 25-30 cm long, with a reticulated woody skeleton; tubercles at first prominent, 16-22 mm long, but on old stems more or less inconspicuous; pulvini sparingly covered with wool and bearing a small crescent-shaped tuft of light brown bristles at the upper margin; spines usually 4, stout, loosely sheathed, straw-colored, strongly deflexed, flattened, 2-3.5 cm long, occasionally 1 or 2 smaller ones, not increasing in size and number after first season's growth; glands conspicuous, a half dozen or more between the spines and bristles; flowers greenish purple, 1.5-2 cm broad; fruit ovate to subglobose, narrowly but deeply umbilicate, 2-25 cm long, juicy, scarlet, usually nearly smooth, but sometimes some of the pulvini bearing 1-3 strong deflexed spines; seeds irregular, 3-5 mm in diameter, commissure broad, with conspicuous spongy appearance."—Toumey Garden and Forest 9: 432 (28 N 1896).

"An interesting species of *Cylindropuntia* grows in considerable abundance about 5 miles east of Tucson, but, so far as known, only in this one locality. It seems to be nearest related to *Opuntia Thurberi* E., but differs from that plant, so far as one can judge from the incomplete description and examination of type material in the Engelmänn herbarium, in its longer more strongly deflexed spines, smaller and different-colored flowers, etc. It may be known from all related species by its bright scarlet fruit, 4 strongly deflexed spines and peculiar cork-like margin to the seeds. This plant and *O. leptocaulis* are the only *Opuntias* with which I am familiar that produce small lateral branches no larger than the fully developed fruits, the function of which seems to be to drop to the ground and develop into new plants. The fruit matures in Dec., but remains attached to the plant until the following May. It has an agreeable acid flavor and its bright color makes it very conspicuous against the green stems."—Toumey l.c.

This is probably *O. Stanlyi*, of which the following description is all that is known:—'*Opuntia*? Oct. 22, 1846. Abundant on the Del Norte and Gila. A remarkable plant, apparently more like a *Mamillaria* than like an *Opuntia*. The fruit is also represented without areolae or tubercles, exactly like the smooth fruit of a *Mamillaria*; but this may be an oversight of the artist. The habit of the plant suggests the belief that it is an *Opuntia* of the section *Cylindraceae*. Joints or branches ascending, cylindrical, tuberculated, 4-6 inches long, 1-1¼ inches in diameter; tubercles very prominent, with about 8 lines (1-1½ inches) straight spines; fruit obovate, umbilicate, scarlet, towards the top of the branches, about 9 lines long and 6 in diameter. It is a distinct species, which I am gratified to dedicate to the skilful artist who has drawn all these figures,—Mr. J. M. Stanly."—E in Emory r 158 f. 9.

Subgenus *PLATOPUNTIA* E.—"Joints compressed; rhabpe forming a prominent bony margin around the seed; embryo completing a little more than one circle around the scanty albumen; cotyledons contrary to the sides of the seed."—E.

OPUNTIA ANGUSTATA E. & B.

OPUNTIA ARENARIA Engelm.

OPUNTIA AURANTIACA Gil.

OPUNTIA BASILARIS Engelm.

Variety RAMOSA Parish.

OPUNTIA BECKERIANA KS.

OPUNTIA CAMANCHICA E-B.

OPUNTIA CANDELABRIFORMIS

Mart.

OPUNTIA CHLOROTICA Engelm.

OPUNTIA CRASSA Haw.

OPUNTIA CRINIFERA Pf.

OPUNTIA DECUMBENS S.

OPUNTIA DULCIS Engelm.

OPUNTIA ENGELMANNI Sim-Dyck.

OPUNTIA FICUS-INDICA Mill.

OPUNTIA FILIPENDULA E.

OPUNTIA FOLIOSA S.

OPUNTIA FULVISPINA Sim-Dyck.

OPUNTIA FUSCOATRA E.

OPUNTIA GALAPAGEIA Hensl.

OPUNTIA GLAUDESCENS S.

OPUNTIA GLAUCOPHYLLA Wendl.

OPUNTIA GRANDIS Hort.

OPUNTIA HYSTRICINA E-B.

OPUNTIA HYPPTACANTHA Web.

OPUNTIA INAMOENA KS.

OPUNTIA INERMIS P DC.

OPUNTIA LANCEOLATA Haw.

OPUNTIA LARREYI Weber.

"Plant only 9-12 dm high, with large orbicular glaucous joints; fruit 'as large as a goose egg', juicy, pulpy, and with purple pulp; seeds small 'much like those of *O. ficus indica*'. Type unknown. A Mexican species, found by Dr. Weber about Queretaro, and pronounced by him the most delicious of all the fruits he had tasted. Known as 'camuessa'.—Coulter, Cont Na hb 3:423.



OPUNTIA LEUCOTRICHA P DC.  
 Opuntia lindneri E. is Ergelmannii.  
 OPUNTIA MACROCENTRA Engelm.  
 OPUNTIA MACRORHIZA Engelm.  
 OPUNTIA MACULACANTHA F.  
 OPUNTIA MICRODASYL Pfreff.  
 OPUNTIA MICRODISCA Web.  
 OPUNTIA MICO OSCARPA KS.  
 OPUNTIA MISSOURIENSIS P DC.  
 OPUNTIA MONACANTHA Haw.  
 OPUNTIA NIGRICANS Haw.  
 OPUNTIA OCCIDENTALIS Engelm.  
 OPUNTIA OLIGACANTHA S.  
 OPUNTIA PALMERI Engelm.

“Joints oval, smooth (not tuberculated), pale glaucous, 20-25 cm long by 15-20 cm broad; pulvini 2.5-3 cm apart, with pale brownish or gray persistent wool, a few very slender straw-colored bristles, and slender flattened or compressed straw-colored spines 2.5-3 cm long (5-7 cm upper pulvini with some smaller additional ones, 1-3 on lower pulvini), erect or spreading, or the upper ones (from upper part of pulvini) mostly deflexed. Type, Palmer of 1877 in hb Mo bot gard. Near St. George, Utah.”—Coulter, Cont Na hb 3:42.

OPUNTIA PESCICORVI Le Conte.  
 OPUNTIA PHAEOCANTHA Engelm.  
 OPUNTIA PILIFERA Web.  
 OPUNTIA POLYANTHA Haw.  
 OPUNTIA PROCUMBENS E-B.  
 OPUNTIA PUBERULA Pf.  
 OPUNTIA PYRRHACANTHA KS.  
 OPUNTIA QUIMILO KS.  
 OPUNTIA QUIIENSIS Web.  
 OPUNTIA RAVINESQUII Engelm.  
 OPUNTIA RHODANTHA KS.  
 OPUNTIA ROBUSTA Wendl.  
 OPUNTIA RULESCENS S.  
 OPUNTIA RUBRIFOLIA Engelm.

“Prostrate, with thick ovate joints 12-15 cm long by 10 cm broad, not tuberculated; leaves spreading, somewhat recurved, reddish, 8-10 mm long; pulvini 2-2.5 cm apart, with brownish-gray persistent wool and numerous yellowish bristles (especially on the upper edge); spines often inserted, 2.5-6 cm long, often a few additional smaller ones, all deflexed (almost appressed); flowers and fruit unknown. Type, Palmer in hb Mo bot gard. St. George, Utah.”—Coulter, Cont Na hb 3:424.

OPUNTIA RUFIDA Engelm.  
 OPUNTIA RUTILA Nutt.  
 OPUNTIA SCHEERI Web.  
 OPUNTIA SENILIS Roezli.  
 OPUNTIA SETISPINA E.  
 OPUNTIA Sphaerocarpa E-B.  
 OPUNTIA SPINULIFERA S.  
 OPUNTIA STREPTACANTHA Lem.  
 OPUNTIA STRIGILIS E.  
 OPUNTIA SULPHUREA Gill.  
 OPUNTIA TENNISPINA Engelm.  
 OPUNTIA TOMENTOSA S.  
 OPUNTIA TORTISPINA E-B.  
 OPUNTIA TREILEASII Coulter.

“Erect, diffusely branching; joints orbicular to obovate, fl. shy, with terete base, 15-25 cm long; pulvini not depressed, with long (5- cm) dense dirty-yellow bristles; leaves on young shoots 5 mm long, spreading (more than twice as long as those of basilaris and darker-red); flower and fruit not seen.—Type, growing in Mo. Bot Gard. 1893, from collection made by Trelease in 1892. At Callente, in the Te-

hachapi Mountains, California. Specimens examined: California (Trelease of 1892). This species is near *O. basilaris*, but differs in its rounder more fleshy joints (terete below), pulvini not depressed (in *O. basilaris* there is a depression for the pulvini with a furrow on either side in the genera surface), yellowish bristles, and especially in its much larger leaves.”—Coulter (cont Na hb 3:431-435).  
 OPUNTIA TRIACANTHA P DC.  
 OPUNTIA TUNA Mill.  
 OPUNTIA URSINA Weber.

Opuntia ursina is a name given by Albert Weber to a curious and beautiful plant of the Mohave desert, advertised as the Grizzly Bear cactus. The joints are about 3 by 5 inches, densely covered with slender flexuous ivory white spines, the longest over 6 inches long, and completely hiding the plant. A cutting reminds one of the “Old Man” cactus of Mexico, but this belongs among the prickly pears—forming low wide spreading masses of interlacing snow white spines.

OPUNTIA VULGARIS Mill.  
 OPUNTIA XANTHOSTEMMA KS.

Subgenus Peireskiopuntia.

OPUNTIA BRANDFEGEEI KS.  
 OPUNTIA GOLZIANA KS.  
 OPUNTIA PITTACHE Web.

Subgenus Brasilopuntia.

OPUNTIA BRASILIENSIS Haw.

RHIPHALIS LUMBRICOIDES Lem.  
 RHIPHALIS MADAGASCARIENSIS Web.  
 R. MESEMBRIANHENOIDETS Haw.  
 RHIPHALIS MICRANTHA DC.  
 RHIPHALIS MINUTIFLORA KS.  
 RHIPHALIS MONACANTHA Gris.  
 RHIPHALIS MYOSURUS KS.  
 RHIPHALIS NEVES-ARMONDII KS.  
 RHIPHALIS PACHYPTERA Pf.  
 Variety crassior S.  
 RHIPHALIS PARADOXA S.  
 RHIPHALIS PENDULIFLORA NEBR.  
 RHIPHALIS PENTAPTERA Pf.  
 RHIPHALIS PLATYCARPA Lem.  
 RHIPHALIS PULVINIGERA Lindb.  
 RHIPHALIS PUNICEO-DISCUS Lindb.  
 RHIPHALIS RAMULOSA Pf.  
 RHIPHALIS REGNELII Lindb.  
 RHIPHALIS RHOMBEA Pf.

Variety CRISPATA KS.  
 RHIPHALIS ACULEATA Weber.  
 RHIPHALIS ALATA KS.  
 RHIPHALIS ANCEPS Weber.  
 RHIPHALIS CAPILLIFORMIS Weber.  
 RHIPHALIS CAVERNOSA Lindb.  
 RHIPHALIS CLAVATA Weber.  
 RHIPHALIS COMORENSIS Weber.  
 RHIPHALIS CONFERTA S.  
 RHIPHALIS DISSIMILIS KS.  
 RHIPHALIS ELLIPTICA Lindb.  
 RHIPHALIS ELLIPTICA Lindb.  
 RHIPHALIS ERYTHROCARPA KS.  
 RHIPHALIS FLOCCOSA S.  
 RHIPHALIS GIBBERULA Weber.  
 RHIPHALIS GONACARPA Weber.  
 RHIPHALIS GRANDIFLORA Haw.  
 RHIPHALIS HADROSOMA Lindb.

RHIPSALIS HOULLETTIANA Lem.  
 RHIPSALIS LINDBERGIANA KS.  
 RHIPSALIS LINEARIS KS.  
 RHIPSALIS SAGLIONIS Lem.  
 RHIPSALIS SANSIBARICA Weber.  
 RHIPSALIS SQUAMULOSA KS.  
 HRIPSALIS SUTREZIANA Weber.  
 RHIPSALIS TETRAZONA Weber.  
 RHIPSALIS TRIGONA Pf.  
 RHIP-SALIS TRIGONENSIS Weber.  
 RHIPSALIS VIRGATA Weber.  
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 Hariota villigera KS Fl Br 266; mon 613.  
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 CEREUS STRICTUS DC.  
 CEREUS RUSSELLIANUS Otto.  
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 MELOCACTUS COMMUNIS L & O.  
 MELOCACTUS DEPRESSUS Hook.  
 MELOCACTUS GONIACANTHUS Lem.  
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 MELOCACTUS MEOCACANTHUS I & O.  
 MELOCACTUS MICROCEPHALUS Miq.  
 MELOCACTUS MIQUELII Lehm.  
 MELOCACTUS OBTUSIPETALUS Lem.  
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 Rose, Contr U S Na Hb 5: 258 t 62.—“This seems to be the ‘hikora rosapara’ of which Luthaltz writes: ‘Rosapara is a white and spiny hikora. \* \* \* It must be touched with clean hands and only by people who are well baptised, for he is a good Christian, say the Christian Tarahumaris and keeps a sharp eye upon the people around him.’”

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#### CEREUS GEOMETRIZANS Mart.

Arborescent, 20 feet high or more, assuming somewhat an umbrella form from its manner of branching; joints mostly short, thick; ribs 5 or 6, acute when young, with sharply defined intervals—on old plants often very obtuse, bearing large woolly spineless areolæ; stems of young growth 3 inches in diameter, areolæ  $1\frac{1}{2}$  inch apart, woolly—in age the enlarged bulbous bases of the spines are in close contact, covering the areolæ completely (or spineless!); radial spines 3-5,  $\frac{1}{4}$ - $1\frac{1}{2}$  inches long, central spine  $1\frac{1}{2}$  inches in maximum length, straight or twisted, all stout, angled, ashy black, woody; central spine sometimes absent, lateral radials usually the longer, very variable. Plant smooth, bright apple green or glaucous, known as the garambullo. Fruit rarely over  $\frac{1}{2}$  inch long, half as great in diameter, or globose, attached to a small tomentose areolæ, remains of flower often persistent, when deciduous leaving a small round scar; epidermis usually smooth, with 1-6 tomentose areolæ bearing minute scales (more rarely bearing in their axils a more minute spine), purple (sometimes glaucous) with purple pulp; fruit bursting irregularly at maturity. As many as 14 fruits were seen growing from one areolæ; one rib of 11 areolæ on a joint of 5 ribs bore 36 fruits, only 1 of the areolæ without fruit, and this is frequent on the hundreds of branches—old and young alike, almost to the trunk. Seeds large, black, 63 from one berry. Fruit ripening in June, 1902, in the state of Oaxaca, Mexico (Orcutt 2670); in July near San Luis Potosi (2609), where its growth is smaller, and large

quantities are collected by the inhabitants and eaten fresh, or dried; Tehuacan (2630).

Console made this the type of his genus *Myrtillocactus*. *Cereus cochal* Orcutt, from Lower California, is closely allied, and treated as a variety by some authors.

#### CEREUS TRIANGULARIS Miller.

Climbing over rocks and trees, joints 3-sided,  $1\frac{1}{4}$  inches in diameter, 1 or 2 to many feet long, curving, the side next to tree or rock nearly flat, the others slightly concave; ribs acute, undulate-tuberculate, bearing in the depressions between the undulations small tomentose areolæ  $1\frac{1}{4}$ - $2\frac{1}{4}$  inches apart, with 3-4 stout bulbous brown or blackish spines 1-2 mm long. Flowered (28 Je 1902) in the night; flower a foot long; tube of corolla 5 inches long, light apple green, spineless, with about 10 greenish yellow sepaloid scales,  $\frac{1}{2}$  inch wide or less, acuminate, yellowish, about 20; petals snowy white, an inch wide, 5 inches long, acuminate about 20; filaments white, 2 inches shorter than the petals, anthers sulphur yellow; style 9 inches long,  $\frac{1}{4}$  thick, white; 25 spreading slender white stigmata three-fourths inch long; fruit light crimson, 3 inches in diameter, 5 in length, with about 20 sepaloid apple green scales, forming a pretty color-contrast, epidermis an eighth of an inch thick, pulp white, filled with about 3,000 small black seeds (fruit bought in Tehuacan market for 6 cents, 28 Je 1902). Plant rather light green, the acute ribs narrowly margined with brown, 1-2 mm wide or less on either side. *Huachala* or *pitajaya* of the Indians. States of Puebla and Oaxaca, Mexico (Orcutt 2710, 2711).

#### CEREUS GIGANTEUS Engelm.

The 'Suwarro' or giant cactus of Arizona and Sonora, 25-60 feet high, 1-2 in diameter, thickest about the lower third where generally the 2 or 3 alternate or sometimes opposite branches start, and from thence slightly taper toward the summit. Stems and branches marked by superficial transverse furrows, indicating, as it seems, the annual periods of growth, forming rings of 4-8 inches in height. Branches unequal, and always of less height than the main stem, mostly 5-6 feet long, with 12-18 ribs.

The contents and paging of the West American Scientist, volume 13, of California Art & Nature volume 2, and of the Review of the Cactaceæ volume 3, are identical (issued in order named).