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20c.—10 2c stamps). Dr. A. N. Bell, editor.

Globose to cylindrical, rarely over 18 inches in diameter but sometimes 8 feet high, with 12-21 compressed tuberculated ribs; spines dull red, 7 stout centrals and 11 radials—the stoutest not rarely 4-6 inches long and $\frac{1}{4}$ inch broad, hooked.

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.

Mohave desert, a rare & handsome species occurring usually in great clusters; spines p.

ECHINOCACTUS SCHEERII Sm-Dyk.

Texas, a pretty species resembling *brevihamatus*.

ECHINOCACTUS SETISPINUS Engelm.

Large yellow fls., coral red fruit.

ECHINOCACTUS SILERI Engelm.

ECHINOCACTUS SIMPSONI Engelm.

ECHINOCACTUS SINUATUS Dietr.

"E. subglobosus, apice rotundatus; costis 13 crassis angulato-sinuatis, sinibus profundis acutis, areolis innatis demum subnudis, aculeis subduodenis, marginalibus 10-11 inæqualibus setaceis rectis, junioribus hyalinis erubescensibus, adultioribus albo-griseis opacis, centrali unico longiore ensiformi apice hamato. Habitat in Texas"—Dietr. AGZ 1851. 345.

ECHINOCACTUS TEXENSIS Hoepf. Depressed, 13 to 27 acute ribs; spines stout, annulated, 6 to 7 radical ones and a stronger central spine; flowers rose colored; fruit subglobose, pulpy, red, covered with spiny bristles and soft wool, crowned by the wooly remains of the flower.

ECHINOCACTUS TROLLIETI Rebut.

Identical with E. unguispinus?

ECHINOCACTUS UNCINATUS Gal.

Var. WRIGHTII Engelm. Texas, rare,

ECHINOCACTUS UNGUISPINUS Engm

Rare, Mexico.

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.

E. WILLIAMSH Lem ex Salm.

"(Lem Cat. Cels. 1845, sine descriptione). C. humili inferne ramoso superne tuberculato cinerascete viridi, vertice impresso, tuberculis latis obsoletissime polyedris is costas subconfluentibus pulvillisque instructis remotiusculis lanigeris, lana cinerascete densa longa in penicillum erectum collecta. Floribus parvulis roseis."—Salm. AGZ. 1845, 385

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 produces 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.

ECHINOCACTUS WISLIZENI Engelm.

The strong hooked central spine gives this the name of the Fish-hook cactus said to have so been utilized by the Indians; the large size and have given it the name of Barrel cactus; to the Mexicans, in common with most species of the genus, it is the *Visnaga*, utilized in confections. Var. ALBISPINA Toumey, white spined. Var. DECIPiens Engelm.

E. WRIGHTII Engelm.—var. of *uncinatus*.

Genus ECHINOCEREUS Engelm.

Included under *Cereus*,
E. candicans Hort.—see *rigidissimus*.

Genus ECHINOPSIS Zuccarini.

Included under *Cereus*.
E. EYRIEII: short spines, white fls.
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.

Doubtless only a form of *multiplex*.

Genus EPIPHYLLUM Pfeiffer.

E. GAERTNERI: white fls.

E. MACOYANUM: ?

E. RUSSELLIANUM:

EPIPHYLLUM TRUNCATUM Haw.

Inch, crab or lobster cactus.

Genus LEPISMIUM Pfeiffer.

This genus is merged into *Rhipsalis* by some botanists, we have none to offer at present.

Genus LEUCHTENBERGIA Fisch.

LEUCHTENBERGIA PRINCIPIS Fisch.

Triangular tubercles about 3 inches long & surmounted by straw-like spines 4-6 in. long

Genus LOPHOPHORA Coulter.

LOPHOPHORA WILLIAMSII Coulter.

Best known as *Arhalonium*, & more properly as an *Echinocactus* (which see).

Var. *LEWINII* (*Arhalonium Lewinii*):

Genus MALACOCARPUS Salm.

Genus MAMMILLARIA Haworth.

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.

MAMMILLARIA ARIZONICA Engelm.

§*Coryphantha*. The plant advertised as *impexioma* is a form of this, also *Alversoni*.

MAMMILLARIA BARBATA Engelm.

MAMMILLARIA BOCASANA Poselg.

This beautiful plant is covered with the finest tender hair like spines.

M. CARNEA, an elegant plant,

M. COMPACTA, clusters.

M. CORNIFERA, large showy fls

MAMMILLARIA DECIPIENS Schw.

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

MAMMILLARIA DOLICHOCENTRA Lm

M. lava more properly; very long tubercles & spines, of quaint appearance.

M. DIOICA K. Brandegee.

M. Goodridgii Engelmann (not of 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 ECHINUS Engelm.

Hedgehog mammillaria, heavy stout centrals, & large unique yellow flowers.

MAMMILLARIA ELEGANS DC.

Neat lovely white spines, like a ball of snow,

small crimson fls.—most attractive

MAMMILLARIA ELEPHANTIDENS Lem.

Elephant's Tooth—so-called from the size & shape of the tubercles.

M. ERECTA Lem.

Mineral del Monte—on high mountains in the cold region of Mexico, yellow spines & fls.

M. FISURATA—see *Arhalonium fissuratum*.

M. FORDI 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 emergent, $\frac{1}{8}$ - $\frac{1}{4}$ 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 FULVISPINA Haw.

MAMMILLARIA GABBII Engelm.

Cactus Brandegeei & Gabbii Coulter, near M. Heyderi, with milky juice, "No. 302."

MAMMILLARIA GOODRIDGII Scheer.

We have just collected what is now believed by K. Brandegee to be the typical form.

MAMMILLARIA GLOCHIDIATA Mart.

Once distributed as *zephyranthoides*.

MAMMILLARIA GRAHAMI Engelm. Plant 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.

Var. *ARIZONICA*, a much larger, stouter-spined plant—perhaps *barbata*? Either form,

MAMMILLARIA HALEI Brandegee.

§*Cochemiea*, cereus like, with straight, long stiff purplish brown spines, scarlet fls. similar to *Epiphyllum*, & large red fruit.

MAMMILLARIA HEYDERI Muehlenpf.

Var. *APPLANATA* Engelmann,

M. KRAMERI, m

MAMMILLARIA LASIACANTHA Engelm.

A beautiful feathery looking species, small & irregular, looking more like a bunch of down

M. LONGIMAMMA DC. Mexico,

Flower $1\frac{1}{2}$ inches across, 18 canary yellow petals & 12 brownish sepals, 9 greenish yellow stigmata, style green, filaments white, anthers orange color; state of Hidalgo, torrid zone

MAMMILLARIA MACROMERIS Engelm.

Tubercles large, spines long, flowers $2\frac{1}{2}$ -3 $\frac{1}{2}$ inches across of a distinct carmine & fine.

MAMMILLARIA MEIACANTHA Engelm.

Form of Heyderi, milky juice.

Var. *LONGISPINA*, more & longer spines.

M. MICROMERIS Engelm. Texas.

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.

Var **GREGGII**, larger,

MAMMILLARIA MINIMA Reichb. A tiny 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.

Stands wet & heavy soil,

M. NICHOLSONI Hort Mexico.

The plant 3 inches across, producing copious wool in the depressed top, tubercles 4-angular, crowded, 4 cruciate centrals, the longest $\frac{1}{2}$ inch & numerous short slender white radial spines.

MAMMILLARIA PECTINATA Engelm.

A beautiful plant bearing very large yellow fls, $2\frac{1}{4}$ inches across when fully open, outer sepals reddish-green; petals sulphur yellow.

M. PETERSONI, 'long white spines interlacing the plant, fine scarlet fls.'

M. PEFELFERI, 'covered with golden spines which 'fairly dazzle in the sunlight.'

MAMMILLARIA PHELLOSPERMA E.

Fls rose purple, blooming in the fall; many soft white radial spines, 1-6 hooked brown or black centrals. Fruit clavate, bright scarlet, as it is a desert species it needs dryness.

MAMMILLARIA PONDII Greene.

MAMMILLARIA PUSILLA Sweet.

'This beautiful little cactus is always admired for its bright silvery spines, which radiate in the sun. fls yellowish white with a red stripe in center of petals.'

M. RHODANTHA Link & Otto. Mexico.

Fls produced in succession during the summer, bright rose, a pretty sort.

MAMMILLARIA ROSEANA Bndg.

MAMMILLARIA SCHEERII Muchlplf.

MAMMILLARIA SENILIS Lodd.

MAMMILLARIA SPINOSISSIMA Lem.

MAMMILLARIA STELLA-AURATA Mt.

Golden-Star; yellow spines in a flat-spreading star-like rosette, a dwarf, much branched.

MAMMILLARIA STROBILIFORMIS Shr.

Better known as tuberculosa, 2-5 in. high, often with globose branches at the base

MAMMILLARIA UNCINATA Zucc.

Our plants of this are not typical, but a very pretty distinct form from Mexico.

MAMMILLARIA WILCOXI Tourmey.

MAMMILLARIA WRIGHTII Engelm.

Genus MELOCACTUS De Candolle.

MYRTILLOCACTUS GEOMETRIZANS C

Cereus geometrizans of old authors, probably a synonym of the same, or a form.

Genus NOPALEA Salm.

NOPALEA AUBERI Salm-Dyck. A Cuban cactus, of rapid growth, assuming a tree-like 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; cuttings

N. DEJECTA, Cuba, cuttings

Genus OPUNTIA Tournefort.

"Tube of the flower very short, cup-shaped. Petals spreading or rarely erect. Ovary with bristle-bearing areolæ in the axils of small terete deciduous sepals. Berry succulent or sometimes dry, marked with bristly or spiny areolæ, truncate with a wide umbilicus. Seeds large, white, compressed, with the embryo coiled around 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 areolæ with the spines, mostly large, open only in sunlight. Fruit often edible, often large."—E.

OPUNTIA ACANTHOCARPA E. & B.

E-B 4: 51 t 18 f 1-3, t 24 f 11 seeds. E syn 308; k 5: 120. Wp an 5: 56. Wat I 405. ct 3: 454 461. Toumey G-F 8: 325. cov 4: 112 242 277. He 91. Pr 984.

"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 9-10 lines long; interior spines 1-1 $\frac{1}{4}$ ', 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.

?*O. californica* E Em 157 f 11.

OPUNTIA ANGUSTATA E. & B.

E-B 4: 39, t 7 f 3-4, t 22 f 11, seeds.

E syn 292; bot ca 1: 248. Wp an 5: 59. Wat I 405. ct 3: 425 462. cov 4: 112 245. He 91. Fr 953.

“Prostrata vel ascendens; articulis elongato-obovatis versus basin angustatis: pulvillis remotis setas fulvas graciles aculeosque paucos (2-3) validos compressos stramineos seu albidos versus basin rufos deflexos gerentibus; bacca obovata tuberculata; seminibus magnis. OPUNTIA ARBORESCENS Engelm.

E Wis 90; Em 157 f 10; fm 52; 5: 208; syn 307; m b 58 77 t 75 f 16-17 seeds; l 14; k 120; wh 130; bot wr. E-B 4: 51, t 17 f 5-6, t 18 f 4, t 24 f 12 seed. Sm 250. Lab 492. Wp an 3: 896; 5: 56.

“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 flava, 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 second year (Fendler); in the north 5-10, south 20 and more feet high, 5-10' in diameter, last branches 2-4' long; spines of the specimens on Waggon-mound 20-30 in each bunch; further south only 12-20, generally 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 diameter; stamens red; fruit about 1' long, y.

“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° high, but grows about Santa Fe to the height of 8 or 10°, 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

OPUNTIA ARENARIA Engelm.
E syn 301; m b 52 57 t 75 f 15 seed. Wp an 5: 53. Waq I 405. ct 3: 439, 462. Hm 549. He 91. Fr 970.

OPUNTIA BASILARIS Engelm. & Bigelow. Low; joints 5 to 8 inches long, triangular, proliferous from their base, pubescent, unarmed, but beset with numerous dense fascicles of short brownish bristles, as is also the ovary. Flowers large, 2½ to 4 inches in diameter, bright magenta, and very numerous; fruit dry, with large and thick seeds.

Var RAMOSA Parish. In cultivation the typical form becomes branched like the variety. One of the most satisfactory cacti that we know for an amateur's collection, flowering profusely and growing readily. In the deserts of California, Arizona, Nevada and Mexico, the whole plant sometimes assumes a brownish red, but in cultivation it seems to maintain a glaucous green color.

OPUNTIA BERNARDINA Engelm.

OPUNTIA BIGELOVII Engelm.

E in E-B 50 t 19 f 1-7; syn 307; bot ca 1: 259. Wp an 5: 56. Wat wh 9; I 405. Toumey G-F 8: 325. ct 3: 449, 461. Or W 6: 22 23 25. He 91.

O. Bigelowii Fr 981.

Opuntia bonplandi HBK. is ficus-indica.

OPUNTIA BRACHYARTHRA E. & B.

E-B 47 t 12 f 9. E syn 302. Fr 979

OPUNTIA BRASILIENSIS Haw.

OPUNTIA CHLOROTICA Engelm.

E-B 38 t 6 f 1-3. E syn 291; bot ca 1: 248. Wp an 5: 49. Wat I 405. ct 3: 422 492. cov 4: 113 240. He 91. Fr 952.

O. tidballi Bigelow Pac Ry r 4: 11.

OPUNTIA CURASSAVICA Mill.

OPUNTIA CYLINDRICA DC.

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