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LITERARY NOTES

The Open Court Pub. Co., of Chicago, have just issued a second edition of their authorized translation of Th. Ribot's "Diseases of personality," the first having been exhausted in 3 years. No other author displays such originality in placing under lucid points of view the disordered mass of data gathered by the psychological specialists. (Pp. 164, cloth 75c; paper, 50c.)
THE DELINEATOR, woman's favorite magazine, issued by the Butterick Pub. Co., 7 W. 18th st., N. Y., at \$1 a year, is a marvel of freshness and utility, the great cater to domestic needs.

A CHECK-LIST OF CACTI.

A preliminary list of all known species, and their authors, habitat, value, etc.

No.	Name and author:	Habitat:	Price:
	ANHALONIUM Lemaire.		
	No. Name and author: Habitat:		\$ 100:
1	areolosum Lem.	Mexico.....	
2	elongatum Salm.—see pulvilligerum.		
3	Engelmanni Lem.	Texas.....	*\$30
4	flexipedum Morf.—see sulcatum.		
5	fissuratum Eng.—see Engelmanni.		
6	furcraeosum (Watson) Coulter.		
7	heteromorphum Eng.—see Eng'mul.		
8	Jourdanianum hort.		
9	Kotschubel Lem.—see sulcatum.		
10	Kotschubeyanum Lem.—see sul'tm.		
11	Lewinii Hennings—see Lophophora.		
13	prismaticum Lem.	San Luis Potosi.	*\$5
13	pulvilligerum Lem.....		
14	retusum Salm.—see prismaticum.		
15	Rungei Hildm.	Mexico.....	
16	sulcatum S.	"	
17	turbidiforme W.—see Echinocactus.		
18	Willamsei Web.—see Lophophora W.		
	ASTROPHYTUM Lemaire.		
19	asterias Lem.—see Echinocactus a.		
20	capricornis hort.—see E. c.		
21	myriostigma } Lem.—see E. myrio-		
22	prismaticum } stigma.		
	CEREUS LINNAEUS.		
	(Including Echinocereus Engelmann,		
	Echinopsis Zucc. and		
	Pilocereus Lemaire.)		
23	abnormis Sweet—see peruvianus.		

THE QUICKSILVER MINES OF OREGON.

The quicksilver mines that have been worked in Oregon, are situated in the northeastern part of Douglass county, on the head waters of the Umpqua river.

There are three that have been worked, the Nonpareil, Bonanza, and Elk Head. The former is situated on Calapooia creek, eight miles northeast of Oakland. The main lead, or deposit, is at the juncture of the sandstone on the west and basalt on the east, which is of a hard quality, and in some places partakes of the columnar structure so common in other parts of the state. There are, however, a few places where sedimentary rocks are on both sides of the lead, yet they seem to be only in spots, forming, perhaps, only cap rocks of no great depth. The veins of ore are much distorted, running a little east of north and west of south, of uneven widths, composed of volcanic tufous rock intersected by veins or ribs of jaspery iron ore formed by infiltration through crevices of water containing iron protoxide and sillicic acid. The dip of the ledge is from west to east, though it is difficult to follow on account of its sinuosity and its swelling and pinching.

The walls are both volcanic rock. The sandstone on the west not reaching quite to the vein proper, neither does the hard basalt, as a rule, reach the vein on the east, there being a softer tufous rock, of varying character and hardness, composing the walls, gradually emerging into the other rock as they recede farther from the vein, which is from a few inches to many feet in thickness. The cinnabar being in spots, specks and streaks throughout the entire vein, which is richer in some places than others.

A small body of limestone has been found within a few yards of the vein in the sandstone. There is in a few places what appears to be a cap rock of sandstone and conglomerate overlying the basalt to the eastward near this mine, as also the Bonanza. This, however, is not without doubt as to its extent in depth. The trap appears to have pushed the sedimentary rocks out of their original position.

The Bonanza mines are situated some three miles southwest of the Nonpareil. The walls of the Bonanza are the footwalls of the sandstone on the west, but on the east it is usually slate. However, this slate is most likely only a cap on the basalt, which evidently underlies the slate at no great depth. The mountain being several hundred feet high, it has been worked mostly by tunnels instead of shafts. There are many small veins of very rich ore running in various directions through the main vein or lode, which is in places two or three hundred feet wide. Many fine specimens of the sulphides of mercury have been taken from this mine. It contains the mettacinnabarite, found only in this mine and the St. John's mine in California, which ore is more of a mechanical mixture than a chemical compound; but is, however, more or less mixed with the red sulphuret, as its streak is often quite red.

This mine also contains a considerable amount of native mercury, usually in fine particles disseminated throughout the various rocks.

The Elk Head mines are situated thirteen miles north from Bonanza, and differ from the others in having the trap, which in this case is amygdaloid, usually containing natrolite crystals and other zeolites on the west, and the sandstone in large areas on the east. The dip is slightly to the east or southeast. A few fine specimens have been taken from this mine, but the ore, though a splendid working ore from its large vein of soft tufa being easily worked, is not noted for fine specimens.

Somewhat to the south of this mine, cinnabar has been found directly in the trap rock without any apparent vein, but no large amount. All three of these mines agree in having large mountains of volcanic tufa or ocherous rock on the north, all of which usually contains a little cinnabar.

A small deposit of cinnabar ore in the southwestern part of Douglass county on the divide between the southern head waters of the Looking Glass creek, and those of Cow creek, eight miles west of Riddle, differs from the foregoing in having a large deposit of serpentine on the east, taking the place of the traps in the other mines.

Deposits of granite in the serpentine are a leading feature of this locality. All the foregoing agree in having the contiguous sandstones much metamorphosed.

The former three are in formations supposed to be not older than Eocene, probably lower Eocene, but the latter is thought to be much older, and not later than lower cretaceous, as some fine fern leaf impressions in the adjacent shale have been on good authority, pronounced carboniferous. I have now a number of these specimens among my collections.

Small deposits of cinnabar have been found in Baker and Josephine counties, but I am not aware of any other deposits of note.

Aurelius Todd.

IMMIGRANT PLANTS IN LOS ANGELES COUNTY, CALIFORNIA.

To the European visiting California it is cheering to find that though 6000 miles from home some of the flowers so familiar to him in the old country still greet him here. Under such varied conditions of soil and climate, these Old World immigrants have considerably changed; some, like the genus homo, have been improved racially and individually, while others, under the same conditions, have shown little increase, or have even depreciated.

Certain immigrant plants are so identified with the invasion of the Anglo Saxon race that their presence may be considered a proof of commencing colonization. 'Twas the constant association of *Plantago major*, the broad-leaved plantain, with the homes of the

early pioneer, that led the Indian to call it the "white man's foot." A farther traveled and more constant companion of civilization is the Shepherd's Purse (*Capsella Bursapastoris*), already abundant in California.

This hardy and prolific weed accompanied the Roman legions in their conquest of Gaul and Britain; and, after the lapse of centuries, followed the Anglo Saxon in the peaceful conquest of the West. The more useful European species have, of course, been primarily introduced for agricultural or domestic purposes. Of these the most valuable and most interesting historically is the *Medicago sativa* Lin., the alfalfa of the Spaniard, and Lucern of the French. This has been so long and so commonly cultivated in Spain that it seems but natural they should have introduced it here in the early days of the conquest. Though cultivated before this time by the Greeks and Romans, it is not indigenous to Italy, having been brought from Media at the time of the Persian war, 470 years before the Christian era. The very name (*Alfalfa*) indicates its origin, being the Arabic derivation of the Persian name. The history of *Alfalfa* is but the history of many of our now supposed indigeneous plants; they have by accident, or otherwise, followed the path of civilization westward, till it becomes difficult to discriminate between what is indigenous, or otherwise.

Among the other useful fodder plants, abundant around Los Angeles, are: *Erodium cicutarium* and *Erodium moschatum*, or Filaree, better known in Europe as the Stork's bill and *Melilotus parviflora*, the Melilot. Whether these, like *Alfalfa*, were intentionally introduced, I have no means of knowing, but the probability is their introduction was accidental, and once introduced, and their value recognized, their wide-spread distribution is easily accounted for. Around Los Angeles, it seems to me its introduction, useful though it is, is not altogether an unmitigated blessing, as it has crowded out the natural and more enduring native grasses that otherwise would afford grazing supplies long after the filaree has disappeared.

Of grasses, I have observed *Lolium perenne* (rye grass), *Dactylis glomerata* (cock's-foot), *Phleum pratense* (cat's-tail), *Festuca myurus*, *Phalaris canariensis* and *Poa annua*, in the lawns and waste places within the city. *Eragrostis pœoides* and *Panicum crusgalli* are not infrequently near the river. *Lolium temulentum* exists sparingly at San Pedro; *Bromus racemosus* general, and in many parts common, and seems the only important grass that tends to naturalize and increase.

Of the clovers, *Medicago denticulata*, the Burr clover alone is common, the nature of its fruit ensuring its maintenance and continued extension; *Medicago lupulina* and *Trifolium arvese*, or Dutch clover, are merely casuals, and rare at that.

First cultivated, as useful plants, *Brassica nigra* (wild mustard),

B. campestris, *Mentha piperita* or peppermint, *Marrubium vulgare*, (Hoarhound) and *Nasturtium officinale*, (common watercress), have passed control and become firmly naturalized. The peppermint and watercress, from the lack of water or marshy ground, are not very abundant, but the others have multiplied to such an extent as to become the commonest and most injurious of weeds, covering acres of ground, to the entire exclusion of more useful species.

Malva borealis, the common mallow of the district, like *Brassica nigra*, grows so rank here as to be scarce recognizable as the European species, and springs up annually in most cultivated localities.

Around town, in some of the drier, localities, the field *Convolvulus* (*Convolvulus arvensis*), has secured a foothold. Its creeping habits and extensive rootlets make it one of the most noxious and ineradicable of weeds, and should it secure itself in the cultivated districts the farmer's life will be no sinecure.

The Caryophyllaceæ order has three representatives:

Silene gallica, not uncommon in waste ground.

Stellaria meadia, around yards, and *Cerastium triviale*, found occasionally in the lawns.

Anthemis cotula, the May weed, is not uncommon on railway banks. *Silybum Marianum*, the milk thistle, grows along the San Gabriel. *Centaurea meletensis*, *Sonchus oleracea* and *Sonchus asper* are common in the city, the latter, contrary to the usual experience, is as common here as *S. oleracea*.

The common dandelion (*Taraxacum officinale*) may be observed in the lawns among imported grasses, but it does not take kindly to the dry soils.

A few specimens of *Vicia sativa*, the tare of cultivation, *Dipsacus fullonum*, the fuller's teazel, are annually found as escapes from cultivation.

Around the gardens and roadsides *Polygonum aviculare* and *Chenopodium album* are very common. The *Plantago major* may be found in moist ground, near zanjas, while its lesser brother, the *P. lanceolata*, or rib-grass, struggles for a casual existence in the grounds in the city.

Last of all, comes the *Urtica urens*, the lesser nettle, clinging, according to its Old World custom, around the haunts of man.

These, so far as I have observed, comprise all the European immigrants present in and around Los Angeles, but as time rolls on, we shall, no doubt, see the importation of many others.

A. Davidson.

LEUCOCRINUM MONTANUM.

The generic name of this dainty little plant means white lily; translating the entire scientific name it might be called, White Lily of the Mountains. It seems more appropriate, however, to name it White Prairie Lily; for it is the most attractive of the spring flowers of the eastern Colorado plains.

In the vicinity of Denver the plants are quite common during May, and in some localities can be seen for miles; great clumps of snowy flowers nestling in a bed of grass-like leaves. It is not unusual to find many plants in one cluster from which fifty blossoms could be easily gathered.

These six rayed starry lilies spring from ground the surface of which is often as hard as a rock and unfold to the blue sky, breathing forth their adoration in a delicate, exquisite perfume.

They seem to be as hardy and brave as beautiful; for a temperature away below zero does not freeze them, nor do the hot, dry days of summer deprive them of life.

It will be wondered, perhaps, how it is possible for this fragile looking flower to live and bloom in such adverse surroundings. The secret lies buried deep in the ground at its roots. During the spring rains and snows, the warmth and moisture awaken this sleeper from its ten months' repose and soon it shoots up, immediately beginning to form roots for the next year. On one plant can be found three sets of roots. The lowest are ghosts of roots that gave up their life to feed the growth of the previous spring; next are numerous long fleshy roots that are rapidly being exhausted; and uppermost the tender white roots are just beginning to collect the supply for the next year.

Most lilies store their nourishment in bulbs, but this independent prairie flower, has instead a short erect root stock and many long, fleshy roots.

The tube of the perianth extends down among the leaves and bracts for about two inches and its divisions are nearly an inch long, making the expanded flower about two inches in diameter. The seed vessel is at the very bottom of the tube and underground. I know of no other plant that naturally ripens its seeds underground, and have been greatly puzzled to explain this peculiar habit, which would seem to effectually check its distribution.

The only reasonable hypothesis that has occurred to me is this: the plant requires to be some depth below the surface so as to obtain sufficient moisture; it is found where the signs of gophers and prairie dogs abound; so, probably, the underground portions serve as food for these little animals and the seeds are thus properly distributed.

Alice Eastwood.

THE FOREST TREES OF OREGON.—III.

The timber of the following forest trees is specially adapted for cabinet work:

THE OREGON BROAD-LEAVED MAPLE (*Acer Macrophyllum*).—The wood of this tree is dense and handsome, polishing well, with a rich variety of grain. For household furniture it is a valuable material. As a shade tree it is superior. It grows rapidly, transplants easily, and if left to itself forms a handsome head.

ACER CIRCINATUM (the Vine Maple).—As its name indicates, it is too small for anything larger than barrel hoops, for which purpose it is sometimes sent to San Francisco.

OREGON ASH (*Fraxinus Oregona*).—This ash is abundant along the streams of western Oregon, sufficiently so to give it a place as a wood of commerce. Specimens of it may be seen in our cabinet shops that will vindicate this claim. The U. S. custom house at Portland is finished inside with Oregon ash. It loves moist places, and is on this account not suitable for shade or ornament.

OREGON ALDER (*Alnus Oregona*).—The Oregon alder is abundant along stream beds and other damp places. So marked is its love for springs and streams that the presence of a clump of these alders will often reveal to the thirsty explorer a spring of water. Its trunk is often two feet through. Its wood is often used in our cabinet shops, where it is prized for inside work such as drawers.

OREGON MYRTLE or California Laurel (*Oreodaphne Californica*). This handsome, fragrant tree is abundant along the Umpqua river and through Rogue river valley. It is at its best around Coos bay, where it is shipped to San Francisco. As it is so heavy that it will not float in water it is difficult to bring this wood to market. It is durable and susceptible of a fine polish, and in every respect is a wood to be prized in commerce. As an ornamental tree it is highly valued, but is difficult to transplant. Its fruit is fairly abundant and the tree may be raised from the seed.

THE OREGON LAUREL or Madrona (*Arbutus Menziesii*).—The madrona is frequent in Jackson county and occasional in the Willamette valley. For purposes of commerce it is not abundant enough. It is a handsome, dense, close-grained wood that bears a good polish and is durable. As an addition to the lawn or dooryard it is a real ornament, resembling the European laurel.

THE DOGWOOD (*Cornus Nuttallii*).—This tree is ordinarily too small and is too seldom met to be of any importance to commerce. But its wood is a very handsome one for furniture or parts of furniture requiring narrow boards. It often grows to be twelve or fifteen inches through and is capable of a high polish. In all respects it is a fine wood for the turning lathe.

THE COTTONWOOD (*Populus trichocarpa* or *Balsamifera*).—This tree is very abundant along the rivers and smaller streams and often

reaches a large size. Recent experiments in making paper from the fibers of this wood have been so successful that there is but little doubt of its future importance. This wood is soft and its fibers so silky as to insure the best results for paper making.

WILD CHERRY (*Prunus emarginata*, variety *mollis*). In the Willamette valley this tree is often in small groves of slender, straight form, eight to ten inches through; more seldom one finds a single tree twelve to eighteen inches through. Its wood is a handsome smooth material for furniture. In the coast mountains it is often seen in groves of considerable extent of long, straight and slender poles.

Thomas Condon.

PACIFIC COAST WOMAN'S PRESS ASSOCIATION.

This Association formally announced its organization to the public by holding its first semi-annual meeting in San Francisco, on the 16th, 17th and 18th of March. It was organized in September last, and has a membership of about two hundred.

The officers were wisely chosen, and are: President, Mrs. Nellie B. Eyster; first vice-president, Mrs. Jeanne C. Carr; second vice-president, Mrs. Kate Douglas Wiggin; third vice-president, Mrs. Sarah B. Cooper; corresponding secretary, Mrs. E. T. Y. Parkhurst; recording secretary, Mrs. Sam Davis; assistant recording secretary, Mrs. Emily Brown Powell; treasurer, Mrs. Mary O. Stanton; auditor, Mrs. Isabel Raymond; librarian, Mrs. S. E. Reamer.

Only those having cards of admission were allowed to enter the hall where the exercises were held, but of these there were enough to fill the room at each session of the Association. The program was sufficiently varied to give interest to each session, while some of the papers were able and of unusual merit.

Among the notable women participating in its exercises—one of whom has a world-wide fame, and others of more than local honor—were, Mrs. Rose Hartwick Thorpe, Mrs. Charlotte Perkins Stetson—a most worthy descendant of Lyman Beecher and niece of Edward Everett Hale, Mrs. Sarah B. Cooper, Mrs. Wiggin, Mrs. Eyster, the president, Mrs. Parkhurst, the founder of the Association, and others. Madame Modjeska is an honorary member of the Association.

San Diego was represented by three delegates, Mrs. Rose Hartwick Thorpe, Mrs. Evelyn M. Ludlum, Mrs. John R. Berry. Mrs. Thorpe's thoughtful poem, "Progress," deserves a careful reading before its beautiful depths are sounded and the poem fully appreciated.

Mrs. Berry read a short paper upon the topic assigned her, "Woman's Work in San Diego."

There were banquets, excursions, and receptions given to the Association by the cordial citizens of the city.

The next, which will be the annual meeting of the Association, will be held during the third week in September, at Hotel Del Coro-

nado, when it will receive from San Diegans as cordial a reception as that accorded to it by dwellers about the Golden Gate.

Mary S. Berry.

CALIFORNIA TREES AND FLOWERS.—III.

LIBOCEDRUS.

L. DECURRENS Torr. California White Cedar. A tall tree, conical in shape, in foliage and habit resembling *Thuja gigantea*.

LILIUM.

There are about fifty species of lilies in the world, California possessing eight handsome species, which are widely sought for their showy and often fragrant flowers. They are better known in European than in American gardens, but are worthy of greater attention in their native land.

L. WASHINGTONIANUM Kellogg. The Washington Lily is a tall, stately plant, with whorls of dark green leaves and many pure white fragrant flowers. A beautiful species, growing in loose soil on ridges or lightly shaded hillsides.

L. PARRYI Watson. This fine and exceedingly rare lily, named in honor of the late Dr. C. C. Parry, produces lovely clusters of large and very fragrant flowers of a clear lemon yellow.

L. RUBESCENS Watson. A rare form resembling the Washington Lily, except in the color of its exceedingly fragrant flowers, which change from white to dark ruby red after opening.

L. PARVUM Kellogg. A low, slender, graceful plant, bearing from two to fifty or more bell-shaped flowers with light yellow centers dotted with brown, the petals tipped with scarlet or crimson.

L. MARITIMUM Kellogg. The Marine Lily resembles the last, small, with dark green foliage, and usually fewer deep crimson or blood-red flowers, dotted with black.

L. PARDALINUM Kellogg. Hardy and very handsome, preferring a rich moist soil; bearing large and brilliant crimson flowers, dotted with black and with a yellow center. A favorite.

L. HUMBOLDTI R. & S. Large and tall, stout, with orange-red flowers, spotted with brown. Thrives in dry open places. The Humboldt Lily is very stately and handsome.

L. COLUMBIANUM Hanson. A graceful miniature of the last.

LOBELIA.

L. SPLENDENS Willd. Two or three feet high, growing in moist situations, producing a many-flowered raceme of intense red blossoms.

LOESELIA.

L. TENUIFOLIA Gray. A showy plant, a span to a foot high, producing abundantly brilliant poppy-red or carmine flowers. Perennial.

L. EFFUSA Gray. An equally beautiful species of the mountains of Lower California, low in habit with light rose purple flowers. Like Phlox and Gillia, *Loeselia* is a genus of lovely flowers, well worthy of cultivation.

LUPINUS.

Showy annuals or perennials, a few shrubby, bearing conspicuous flowers in terminal racemes. The great majority are indigenous to West America. Many have long been cultivated and grown popular. The California species best known in cultivation are the following:

L. AFFINIS Agard. A foot or two high, often growing very rank, producing large spikes of brilliant blue flowers.

L. DENSIFLORUS Benth. Less than a foot high, with white flowers arranged in umbel like clusters on the terminal spike. Sometimes light sulphur yellow.

L. MICRANTHUS Dougl. Low in habit, with racemes of small light blue and white flowers. The cultivated form is considered quite pretty.

L. NANUS Dougl. A slender plant, with bluish, purple or white flowers.

L. NANUS ALBUS. The white flowered form.

L. ARBOREUS Sims. The Tree Lupin is a shrub four to ten feet high, with lilac colored flowers.

L. ARBOREUS LUTEUS. With sulphur yellow flowers, perhaps the typical form. A very ornamental shrub.

L. ELEGANS. What its name signifies.

L. GRANDIFLORUS. A perennial form, with blue, white or purple flowers.

L. POLYPHYLLUS Lindl. Perennial, similar to *L. grandiflorus* if the two are not identical or forms of the same species.

L. POLYPHYLLUS ALBIFLORUS. The white variety.

MAMILLARIA.

Very general favorites among the lovers of the odd or the beautiful are these unique little plants, most exquisite in form and finish. The scarlet edible berries, which cluster among the spines of our California cacti of this genus add also to the beauty of these plants, though the blossoms are often inconspicuous.

M. DESERTI Engelm. A little gem, from the Mojave Desert, of which we have as yet seen but a single plant. One of the choicest of the genus and we hope to rediscover the beauty soon.

M. GOODRIDGII Scheer. Sometimes called the Strawberry cactus, from the delicious flavor of its clubshaped fruit, but also called the Fish-hook cactus from the hooked central spines produced from the mamillae. The spines are sometimes of an ivory whiteness, but oftener of a rich brown color.

M. PHELLOSPERMA Engelm. A handsome plant, worthy of a place in any lady's parlor.

MIMULUS.

M. CARDINALIS Dougl. A showy perennial species, with brilliant large scarlet flowers.

M. GLUTINOSUS Wendl. A low shrub, with bright evergreen foliage and a profusion of buff or salmon colored showy flowers.

M. MOSCHATUS Dougl. Musk. A low, musk-scented plant, bearing large lemon yellow flowers.

MONARDELLA.

A genus of many beautiful flowers, well worth extended cultivation, showy, often sweet scented, either perennial or annual.

M. MACRANTHA Gray. An evergreen species with dark glossy foliage, a span high, producing showy heads of orange-red flowers.

M. NANA Gray. Almost identical in habit and general aspect with the last, the flowers pure white, sometimes suffused with rose. Very beautiful but less showy than the last.

M. LANCEOLATA Gray. A showy annual, producing masses of bright phlox purple flowers, six to eight inches or a foot high, branching, with a strong but pleasant pennyroyal perfume, similar in aspect with numerous related forms, like *M. Pringlei* and many others, all of which are well worthy of a place in any garden.

NEMOPHILA.

Very pretty annuals, mostly Californian, with tender herbage and lovely flowers of delicate blue, violet or white colors.

N. AURITA Lindl. Large violet flowers, one of the finest species introduced into cultivation.

N. AURITA ALBA Dougl. A beautiful white form.

N. INSIGNIS Dougl. Bright blue flowers an inch in diameter.

N. MACULATA Benth. White, with a strong violet blotch at the top of each lobe of the corolla. 'Love Grove.'

NICOTIANA.

N. GLAUCA Graham. A slender shrub, a native of South America, very light green foliage and yellow flowers, considered very striking and ornamental among the sub-tropical foliage plants. Naturalized in Southern California.

NOLINA.

Perennial liliaceous plants, with a thick woody trunk, in aspect somewhat resembling the *Yucca*. The stout flowering stem bears a panicle of numerous small creamy white flowers.

N. BIGELOVII Watson. The flowering stem six to ten feet high, bearing a dense panicle. The plant sometimes grows ten or more feet high.

N. PALMERI Watson. A cluster of these plants will cover a considerable area, and with the coarse, grass-like foliage may well be mistaken for a patch of some coarse species of grass at a distance. Less ornamental than the preceding.

GENOTHERA.

An almost exclusively American genus of over one hundred species, many with showy flowers, and some long in cultivation as ornamental.

G. BIENNIS *L.* The Evening primrose, with its large showy flowers, is too well known to need description.

G. BISTORTA *Nutt.* Showy yellow flowers, usually with a dark brown spot at base of each petal. A low decumbent annual, the variety *Veitchiana* being the form commonly seen in cultivation.

G. CALIFORNICA *Watson.* Low flowers, large white, becoming pinkish, fragrant. One of the loveliest and most delicate of flowers, often two or three inches across.

ORTHOCARPUS.

A large genus of low, branching annuals, nearly related to *Castilleja*.

O. PURPURASCEUS *Benth.* An erect, diffusely branched annual, a span to a foot high, producing numerous dense and thick terminal oblong or cylindrical spikes of flowers. Corolla yellowish, tipped with crimson or red and the whole encircled by the brilliantly colored crimson-purple or rose-purple floral bracts. Hundreds of acres are often transformed into brilliant fields of purple by the abundance of this, one of the handsomest of the spring annuals of California.

PAPAVER.

P. CALIFORNICA. *Gray.* While one of the latest discoveries, this plant ranks among the prettiest of our annuals, the fine bushy plant, a foot or more high, bearing large showy flowers of an average of two inches in diameter. The color is a bright saturn red to orange chrome, with a center of delicate sulphur yellow.

PENTACHAETA.

P. AUREA *Nutt.* This small hardy annual, with its large golden yellow heads of almost double flowers, introduced into cultivation in 1884, is a pretty dwarf composite that may be readily grown.

PENTSTEMON.

Hardy perennial plants with showy panicles of brilliantly colored flowers. Several of the numerous California species have long been in cultivation.

P. CENTRANTHIFOLIUS *Benth.* A showy species, two or three feet high, bearing long slender spikes of bright carmine-colored flowers, an inch long. Acres in extent of our mountain lands are sometimes a solid mass of carmine during the summer, when this handsome plant is in bloom. It was introduced in 1858.

P. CLEVELANDI Gray. One to three feet high, with dark green foliage and bearing a spike of lovely bright solferino-colored flowers, each an inch long.

P. PALMERI Gray. A tall growing species, with a long panicle of large white flowers delicately veined with purple.

P. SPECTABILIS Thurber. Corolla an inch long, broad, bluish-purple. Plant two or three feet high, glabrous. Flowers in a loose elongated panicle. A very showy species. This genus contains nearly a hundred species, nearly all worthy of cultivation, and many native to California.

PHACELIA.

P. CAMPANULARIA Gray. One of the finest species in the genus yet known in cultivation. Has received a first-class certificate in England, where it was introduced a few years ago.

P. CONGESTA. A useful plant in bee-gardens, like the rest of the genus, and one of the best known species in cultivation.

P. TANACETIFOLIA Benth. The Tansy-leaf Phacelia has long been in favor in cultivation for its beautiful foliage. An erect hardy annual, one to three feet high, bearing cymosely clustered spikes of light bluish flowers.

P. TANACETIFOLIA ALBA. A fine cultivated variety, with white flowers.

P. ORCUTTIANA Gray. One to three feet high, branching, bearing a profusion of small white flowers with brilliant yellow centers.

P. PARRYI Torr. One of the loveliest and most desirable of the many pretty annuals of Southern California for cultivation, second only in value to *P. campanularia*. The plant delights in warm sunny exposures, and produces large brilliant royal purple flowers with an open rotate corolla. Everyone admires this modest flower, whose bright face looks out at one with something akin to a human expression.

P. WHITLAVIA Gray. Large bell-shaped blue flowers.

PICEA.

P. SITCHENSIS Carr. Probably the tallest spruce known, growing 150 to 200 feet high, and of pyramidal form. An excellent timber tree.

PLATYSTEMON.

P. CALIFORNICUS Benth. A low annual, a span high, with delicate sulphur-yellow flowers, called Cream-cups by the children. Belongs to the Poppy family.

PROSOPIS.

P. JULIFLORA D C. The Mesquit tree of the desert regions, sometimes planted for hedges. The bean-like pods of this tree are useful for forage, and form an important article of food among some Indian tribes. Very sweet and nutritious.

P. PUBESCENS Benth. The Screw-bean. A smaller tree than the Mesquit, with curiously twisted pods.

PRUNUS.

P. ILICIFOLIA Walp. The Holly-leaf cherry. A beautiful dark evergreen shrub, yielding a pleasant edible fruit. Useful for hedges or ornamental planting.

PSEUDOTSUGA.

P. DOUGLASHII Carr. The magnificent Douglas spruce, better known commercially, perhaps, as the Oregon pine. A gigantic tree, 200 to over 300 feet in height, and very beautiful.

Var. *macrocarpa* Engelm. A small form.

RHUS.

R. OVATA Watson. A handsome evergreen shrub, noted for its glossy foliage and graceful form. The small dark red berries make a cooling drink, pleasantly flavored, resembling lemonade, and the Indians formerly gathered sugar from this species. Thus it may be appropriately termed a Lemonade and Sugar Tree.

R. INTEGRIFOLIA Nutt. The dark evergreen foliage of this shrub or small tree, locally known as the Mahogany, is very handsome, while the larger bright red berries, coated with a white waxy substance also make a refreshing and cooling drink. The Californians formerly gathered and dried the berries for this purpose.

ROMNEYA.

This large white-flowering perennial poppy, named in honor of Dr. T. Romney Robinson, a noted astronomer, is one of the stateliest of California's contributions to horticulture. It is quite a hardy shrub with us, requiring only a sheltered position to protect its flowers; in England it is classified as half-hardy. A rich loamy soil is most suitable to its needs. In early spring vigorous shoots start from the dormant roots, growing from six to fifteen feet high, which do not die down but need to be pruned well back in the fall. A single species.

R. COULTERI Harvey. This magnificent wax-like flower has become very popular wherever known. The large hairy buds open at daylight, the crimped petals slowly unfolding from over the huge bunch of bright yellow stamens (as large as a walnut), until they spread out from six to nine inches. The flowers last several days and the buds open well in water. The foliage is very effective and makes with the flower an artistic study. Grown from either seed or cuttings with difficulty, but a well established root will well repay the attention bestowed upon it.

ROSA.

R. CALIFORNICA C. & S. The wild rose of California, with its

large, single, lovely pink flowers, is as pretty as its more showy cultivated sisters, and equally admired by those who love the beauties of nature.

R. MINUTIFOLA Engelm. Parry's wild Mexican rose, with its small, finely incised foliage, and small pink or white flowers that closely nestled among the leaves, met with a warm welcome when discovered in Lower California in 1882, but has steadily repulsed the kind advances of the gardener and refuses to long survive away from its native sky.

SALVIA.

S. CARDUCEA Benth. The Thistle-leaved sage, known to the Mexicans as *Chia*, is densely white-woolly, with prickly foliage, and showy lavender colored flowers, an inch long, in many-storled head-like whorls on a stem a foot or two high. Cultivated in Europe since 1854.

S. COLUMBARIÆ Benth. Smaller and less conspicuous. Also known as *Chia*. The seeds of either species infused in water form a pleasant mucilaginous drink; used largely by the aborigines medicinally as a beverage.

SAMBUCUS.

S. GLAUCA Nutt. The California Elder forms a large bush or small tree and bears prolifically of its edible berries, prized by some for making pies or sauce.

SCHINUS.

S. MOLLE L. A graceful evergreen tree, a native of Mexico and South America, with glossy light green drooping leaves in twenty or more pairs of slender leaflets. The small white flowers in large panicles followed by lovely clusters of small red berries. The Pepper tree, as it is called, is very ornamental, and planted extensively for shade or avenues.

SEQUOIA.

A remarkable California genus, including the noted Redwood and Big-tree for which California is famous.

S. GIGANTEA Decasne. This giant of the California woods, is the largest and tallest tree known to exist on the American continent, attaining a height exceeding 300 feet, only exceeded in size by some of the gums of Australia.

S. SEMPERVIRENS Endl. The California Redwood is the most valuable timber tree on the Pacific Coast, attaining a height of 200 to 300 feet, with light but strong and durable wood, susceptible to a handsome finish, of a walnut brown color.

SIMMONDSIA.

S. CALIFORNICA Nuttall. A low diffusely branched shrub, forming oval bushes one to five (rarely ten or fifteen) feet high with pale,

rigid evergreen foliage, producing a pleasant edible nut. An ornamental shrub, growing in rich valleys or on arid hills from the Pacific Ocean to the borders of the Colorado Desert.

SISYRINCHIUM.

S. BELLUM *Watson*. The Blue-eyed grass bears umbel-like clusters of small rotate flowers of a delicate shade of mauve, with canary yellow centers. A profuse bloomer. Grows from a few inches to two feet high. A very pretty Iris-like plant.

TORREYA.

T. CALIFORNICA *Torr*. The Californian Nutmeg is a tree fifty to seventy-five feet high, with slender drooping branches often grown for ornamental planting.

UMBELLULARIA.

U. CALIFORNICA *Nutt*. The California Laurel is a handsome shrub or tree, ten to seventy feet high, with thick evergreen leaves, better known in cultivation as *Oreodaphne Californica*.

WASHINGTONIA.

W. FILIFERA *Wendland*. The Californian or Washington fan palm is too well-known to need description. It has become one of the most characteristic trees in Southern California and is a worthy memorial to the fame of the great Washington whose name it bears.

W. ROBUSTA *Wendland*. A robust variety (not specifically distinct?) said to be more easily grown. None of the characters which are said to distinguish these two palms appear to be constant.

YUCCA.

An American genus of a few species of handsome and conspicuous ornamental plants, well known in cultivation.

Y. BACCATA *Torrey*. The Wild Date, or Spanish Bayonet, is a stately plant, sometimes growing ten or more feet high, and producing a pyramidal panicle of fragrant waxy, pure white flowers, or often marked with purple. The large, sweet edible fruit is sometimes called wild bananas.

Y. BREVIFOLIA *Engelm*. The Tree Yucca of the Mojave Desert.

Y. WHIPPLEI *Torrey*. The flowers borne in a large panicle on a scape five to twelve feet high. The rigid serrulate leaves surround the base of the stem in a dense cluster. The flowers are waxy-white or purple tinged. The plant dies after blooming, while the preceding species live year after year.

ZAUSCHNERIA.

Z. CALIFORNICA *Presl*. The flowers of this plant are one to two inches long and three-quarters of an inch across, scarlet to scarlet

vermillion, very showy, forty to fifty flowers on a stem. Plant two to five feet high, growing in large masses on dry hillsides, but more luxuriant near water, where it becomes a very conspicuous flower. A half shrubby perennial, sometimes called wild fuchsia.

ZIZYPHUS.

Z. PARRYI *Torrey*. A spiny shrub, with small flowers, producing an edible fruit of a dull brownish cadmium yellow color, said to make excellent jelly like its near relative, the cultivated jujube.

ZYGADENUS.

Z. FREMONTI *Torrey*. A pretty plant, belonging to the lily family, with paniculate racemes of cream-colored flowers.

C. R. Orcutt.



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Rural Californian, xii. 9, xiv. 5, 7, 8, 9.....	" 20
Open Court, nos 44, 46, 48, 50, 57-62, 64-68, 71, 72, 75-78, 303, 307, 311.....	" 12
Irrigation age, vii, 5; Young's magazine, i, 4, 5.....	" 30
The Naturalists' Companion, vol. I: nos. 2, 5, 6, 8-9, 12, vol. II; nos. 1, 3, 4, 5-6, each.....	06
Reports from U. S. consols, nos. 132, 133, 134.....	12
American gardening, ix 7, 9, 10; x 1, 3, 5, 7; xiii. 10; xiv. 1; xv 4.....	" 36
American agriculturist, xlviii. 2; xlix. 1, 4, 5, 6, 11; l. 2, 6; lli. 2.....	" 04
" Florist, Mch 16, 1891 & nos. 73, 86, 96, 109, 112, 173, 177, 207, 237, 270, 314.....	" 06
Gardening, i, 5; Gameland, iii 5.....	23
U. S. coast and geodetic survey bulletins 23, 24.....	" 33
Western garden, iv. 10; v. 1, 2, 3, 6; Science, 492, 525, 529, 545.....	" 12
Popular science monthly, xxi 8, 11; xxiii 2; xxiv 4, 9; xxvii 8.....	" 40
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Cacti Illustrated.....	05
The Dream City, 64 views of the Columbian Exposition.....	9

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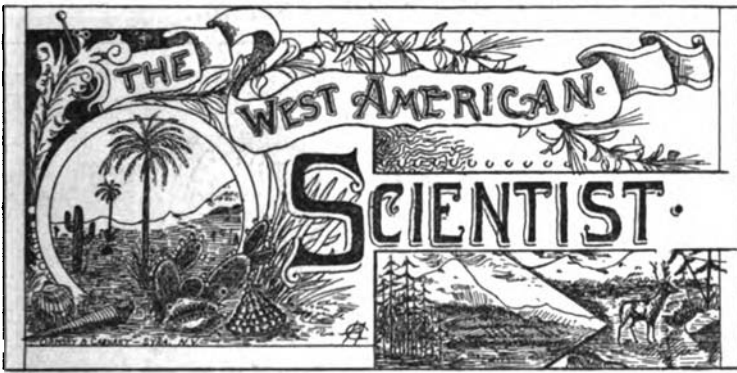
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WHOLE NO. 79.

NOMENCLATURE.

The question of nomenclature is one which just now is being agitated by both botanists and horticulturists. Theoretically, the same laws should obtain recognition in all branches of natural science, zoology, botany and horticulture. The "Recommendations" recently endorsed by the more conservative American botanists, and emanating from the herbarium of Harvard College, give preference in specific nomenclature to the first correct combination; advise that the varietal name is to be regarded as inferior in rank to the specific; discourages the rejection of long established and generally known generic names; and pronounces against the principal of "once a synonym always a synonym" being made retroactive,

Lester F. Ward treats the question of nomenclature at length in the Bulletin of the Torrey Botanical Club, xxii, 308-329, for July, 1895, and is inclined to consider the "Harvard rules" as based solely on sentiment and not tenable if we are to have a stable code.

Let us consider for a moment whether the "new-American school of botanists" or the conservative element, is tending toward a more stable nomenclature in active practice. We (the conservative) use the name *Mammillaria** for a well

*Haworth wrote this name *Mammillaria*; Prince Salm-Dyck, in *Horto-Dyck*, Ed. II. 5, wrote it *Mamillaria*, with the following foot note: "Nomen genericum *Mamillaria* scribendum est, quia non a verbo *Mamma*, sed a diminutivo *Mamilla* deductum." The two forms of spelling have since been

known genus of cacti, as first used by Haworth in 1812. After 80 years of use, on the strength of the law of "once a synonym always a synonym" it is proposed to discard this name because *Mamillaria*† *Stackh.* was dedicated to a genus of algae in 1809—three years earlier—though this use of the name was long since relegated to synonymy itself. The law of priority is also called in play to uphold the replacement of the name *Mammillaria* with the Linnæan name *Cactus*‡ (1735), under which name were grouped all species of cacti at that time known to science.

Neither Otto Kuntze nor John M. Coulter, the modern champions of the genus *Cactus*, as defined by them, seem to be sure of their position. Coulter says: "*Cactus mammillaris* seems to have stood as the type," and follows Kuntze, who, without discrimination, † transferred good and bad species alike from *Mammillaria* to *Cactus*! A name so well established as *Mammillaria*, not only among Botanists, but in the horticultural world, should not be hast-

in about equal use—the authorities at the Royal Gardens, Kew, follow Haworth, while most American botanists have followed in the lead of Prince Salm-Dyck.

† I do not know whether the author wrote this *Mamillaria* or *Mammillaria*, but follow the only spelling I have seen in print, since the original work is not accessible to me.

‡ Otto Kuntze, *Rev. Gen. Pl.*, followed by Coulter, Coville, and others,—non Linnæi.

§ As an example, *M. tetrancistra* and *M. phellosperma* (the latter a well known synonym of the former) are both transferred to *Cactus* as valid species by Kuntze, who made countless similar errors.



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PILOCEREUS SENILIS—CRISTATE SPECIMEN.

ily replaced on grounds open to question. The resurrection of the Linnæan name *Cactus* offers a splendid opportunity for a botanist to affix his name to a multitude of valid species (and synonyms!) not yet transferred—but practical botanists and horticulturists must deplore such “botanical activity.”

The name *Cactus* was first used in a restricted generic sense for a group of *Opuntia* by Lemaire, a fact which would add further confusion if we were to resurrect the name as proposed, or as attempted.

My views have already been partially recorded on the nomenclature question in *Science*, xvii, 67 (reprinted in this magazine, vii, 206), but new points continually arise where individual judgment must be used. It seems extremely doubtful if ever *Cactus* will replace *Mammillaria* in either technical or popular use; or that *Fremontodendron* can long replace *Fremontia*, or any name supplant our *Washingtonia* as applied to our Californian fan palm.

It may be sentiment, but sentiment must always form a part of our language and receive consideration, especially when it aids language to perform its duty. The only final settlement of these vexing questions will be through com-

mon usage and a law ignored by horticulturists and the more conservative of our botanists will ultimately disappear.

C. R. Orcutt.



MEXICAN SHELLS.

While spending a few weeks in and near Mexico City, in 1894, the following land and fresh water shells were observed. There was no opportunity for more than very desultory work, so that the list is necessarily short.

SUCCINEA BREVIS Dkr. I found quite a colony of this little species in the pine woods on the mountains between the cities of Mexico and Puebla, near what is locally known as Rio Frio.

S. UNDULATA Say. A common species in the City of Mexico; my specimens were collected near the Castle of Chapultepec.

HELIX ASPERSA Mull. This introduced European snail has become very abundant along the ditches and canals in the City of Mexico, and in gardens has become quite a nuisance.

H. HUMBOLDTIANA Val. A single specimen was found near the top of the mountain pass, in going to Puebla; said to be one of the commoner species in the State of Mexico.

PATULA HERMANNI Pfr. A colony of this minute shell was found near Rio Frio.

BULIMULAS ALTERNATUS Say. Dr. Herrera, of the Museo Nacional, gave me a few specimens of this shell, which I did not meet in the field.

GLANDINA GUTTATA Cr. & Fisch, near Rio Frio?

G. PLICATULA Pfr. In the mountains north of Cuautla?

PLANORBIS TENUIS Phil.

LIMNÆA ATTENUATA Say.

PHYSA BOUCARDI Cr. & Fisch. With the two preceding species, common in the City of Mexico.

The above shells have all been identified by Wm. H. Dall of the U. S. National Museum, to whom I am indebted for many similar favors.

C. R. Orcutt.

A MONSTROSITY.

Abnormal growths always possess a certain interest to horticulturists as well as botanists. We illustrate herewith a curious plant of *Pilocereus senilis* the old man cactus, as it appeared when discovered in the state of Hidalgo, Mexico. This plant was shipped to Paris, where it attracted considerable attention among cactus fanciers.

EDITORIAL.

For years we have preserved carefully every book, magazine, newspaper, pamphlet, and even catalogues, and circulars—many literary productions that generally meet destruction, but which have a value in a library which aims to be complete and of use to future ages. It is hoped that this material may ultimately find a permanent home in some public institution; in the meantime we shall appreciate any contributions of literature, and in addition to our thanks we offer liberal exchanges in return of seeds, bulbs, native cacti, advertising space in this magazine, or subscriptions to the same. Nearly every one accumulates in time a mass of literature useless in part to the owner—but do not destroy—we want it saved.

We have several thousand duplicate magazines, books and pamphlets, which we will also exchange, or donate to any public institution that will refund to us the postage. Among them we name:

The Semi-Tropical Planter—complete sets. The Great Southwest—sets incomplete. The Young Men's Journal—nearly complete. The West American Scientist—about 50 odd numbers. The North American Review—about 50 odd numbers. 10th Annual Report Calif. State Mining Bureau. Miscellaneous books, magazines and pamphlets.

THE SECRETS OF SUCCESS.

The broad roads to a successful industrial reform, based upon 70 years' experience in England, are thus summed up by the Co-operative News: 1—The establishment of co-operative societies for supplying the wants of their members of every kind, whether by purchasing goods wholesale or manufacturing or producing these goods themselves; 2—the establishment of federal associations, such as grain milling and wholesale societies, for supplying the retail societies with goods that the retail societies cannot otherwise obtain so advantageously, and to manufacture or produce these goods when it is found advisable to do so; 3—in doing these things, to pay capital its fair remuneration and pay fair wages to the workers, besides treating the latter in that considerate manner that all co-operators would desire to be treated, and which is the golden rule ordained by Christ; 4—employing surplus capital in employing co-operators to produce for the supply of the outside market, whether in our own or foreign countries, in order that labor may be justly treated and receive its full reward.

INTEREST.

One of the prime factors in our present industrial condition is interest; 80 per cent. of the wealth of the U. S. is interest bearing today, and our annual interest charge is \$3,000,000,000 or \$800,000,000 more than our annual increase of wealth! In other words, capital not only demands and receives its share in the increase of our national wealth, but the working man's as well, besides drawing to itself \$800,000,000.00 of the past accumulations of labor yearly! The final result can be nothing short of the industrial enslavement of the people, if the present trend of events is not arrested,—and it is in co-operation that we must find the means of arresting and abolishing interest. Co-operation is successful in so far as it destroys this factor, in which is vested the power of capital—for, shorn of interest capital is weak, like Samson of old when shorn of his beard.

NOTES AND NEWS.

Prof. J. A. Miller of Stanford University has accepted a call to the University of Indiana.

The peach blossom has been selected by a vote of the school children of Delaware as the floral emblem of that state.

Prof. Edward Lee Greene, for many years identified with botanical work on the Pacific Coast, has become identified with the Catholic University, of Washington, D. C.

Prof. E. W. Hilgard, of the State University, has been quite ill but is now convalescent.

Prof. Symington has resigned from Stanford University to go to Amherst College.

THE WEST AMERICAN SCIENTIST.

C. R. ORCUTT, Editor and Publisher.

Orcutt, California, U. S. A.

Price, 10 cents; per year, \$1.00.

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RIPANS

WHAT THEY ARE.

A gentleman of a methodical habit, who had adopted the habit of retaining a copy of every prescription issued by his family physician, became interested as time went on to note that the same ingredients were pretty certain to be prescribed at some point of the treatment of every case. For a poor appetite, or a sore throat, for restlessness which disturbed the baby's sleep, and for troubles which beset the aged grandparents, the favorite remedy was always turning up, although slightly modified from time to time and used often in conjunction with others. His family physician had ever been a successful practitioner; and when another was consulted, care had always been taken to obtain the services of some one eminent for skill and reputation. Still the frequent recurrence of the favorite formula was a marked circumstance. One day our friend happened to observe that the formula of a certain advertised remedy was identical with the latest prescription he had received from his own physician, and in some surprise he stated the case to him. The family doctor, after listening to what he had to say, replied: "The case is about this way; whenever there is a disturbance of the functions of the body, no matter of what nature, it is pretty certain to be accompanied by a derangement of the digestive organs. When they are all right the patient gets well. That particular formula that you have observed me to write more and more frequently is the result of an age of careful experiment, and is pretty generally agreed upon now by all educated physicians who keep up with the times. The discovery of the past few years of a means of reducing every drug to a powder and compressing the powders into little lozenges or tablets, or capsules if you prefer, which will not break or spoil, or lose their good qualities from age, if protected from air and light, is the explanation of how it has come about that this prescription is now for sale as an advertised remedy. It is as you say, however, and is all right. It is the medicine that 9 people out of 10 need every time they need any, and I have no doubt that making it so easy to obtain, so carefully prepared, and withal so cheap, will tend to actually prolong the average of human life during the present generation."

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VOLUME IX.

SEPTEMBER, 1895.

NUMBER 80.

THE PARTRIDGE-BREAST ALOE.

ALOE VARIEGATA Linnaeus. An African plant of great beauty, producing spikes of brilliant coral red flowers. It is found in many old-fashioned gardens and receives its common name from the feathery mottling of the leaves.

YERBA MANSE.

ANEMOPSIS CALIFORNICA B. & H. This is one of the favorite medicinal herbs of the old Spanish Californians, but has won a permanent place in European greenhouses, and should be given the attention it deserves in the land of its birth. It is readily grown in moist soil, the apple-green foliage, frequently blotched with crimson, showing off the rather large white flowers to great advantage.



THE HEDGEHOG CACTUS.

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 EYRESII ZUCC. This is less bristling in appearance than *E. Mulleri*, but produces lovely pure white flowers in great abundance.

THE VELVET CACTUS.

CEREUS EMORYI Engelm. 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.

ALLIUM HAEMATOCYTHON Watson.

The mesas and hills around San Diego are decked in springtime with the clusters of bright purplish-tinted flowers of this wild onion, which deserves a prettier name at the hands of its friends. It does not prove quite hardy in New England, but will give enough pleasure for the cost of growing in the house among its more showy cousins.

THE CHOLLAS.

A former characteristic of Southern California landscapes were the thickets of cholla cactus, which still decorate some of our uncleared hill-sides, and abounds in the desert regions and unsettled parts of Lower California and Mexico. The cholla belongs to the same genus as the prickly pear, but differs mainly in the cylindrical, instead of flat, joints and in its non-edible fruits.

OPUNTIA PROLIFERA Engelm. This densely-branching shrub bears a small flower of a pomegranate purple, and once grew in great abundance where the city of San Diego now exists.

OPUNTIA SERPENTINA Engelm. Pro-cumbent, with yellow flowers, comparatively rare in cactus collections.

STAPELIAS, OR "TOAD CACTUS."

These curious plants, native to South Africa, belong to the asclepias (or milkweed) family, but are popularly known by the names "toad cactus," or "carrion cactus," the former from the mottled color of the flower of the best-known variety, the latter from the strong fetid odor exhaled by the flowers. Like most succulents, they are easily grown. There are more than fifty varieties known.

CALIFORNIA FISH-HOOK CACTUS.

MAMMILLARIA GOODRIDGII Scheer. A 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-pitalas," the "llavina" of the Mexicans.

FAIRY FINGER TIPS.

COTYLEDON ATTENUATA Watson. This dwarfish plant is destined to attain great popularity for beds and borders. It was discovered in Lower California in 1836 by C. R. Orcutt, and first introduced into cultivation in 1894. It resembles dwarf *C. Edulis*, and produces panicles of pretty yellowish or rose purple flowers that do not detract from its adaptability for borders or edging to beds.

C. EDULIS Brewer. This sometimes grows two feet across and bears a tall panicle of greenish flowers. It has become widely known under the name of "Finger Tips," from the long, slender leaves, which the Indians of California formerly used as a salad.

E. PULVERULENTA Baker. Large, elegant in form, the broad leaves forming a beautiful rosette and covered with a thick white powder.

C. ORBICULATA Linnaeus. An old-fashioned garden plant, attaining to a tropical luxuriance of growth and producing large pendulous orange-colored flowers of great permanence.

C. LANCEOLATA B. & H. A plant that does well under good treatment, producing a spike of red flowers. The lanceolate flat leaves sometimes of a dull crimson color, but commonly green.

Just a thought to give thee pleasure.

Just a hope to glid the way,

Just a word to speak of Jesus,

Do you love Him as you may?

CENTURY PLANTS.

The agaves form a beautiful class of decorative plants, tropical in aspect, and belong to the amaryllid family, though often erroneously considered as belonging to the cactus family. They are called century plants from another popular fallacy, that they require 100 years before blooming. In tropical countries they attain maturity, blossom and die, in less than twenty years usually.

AGAVE AMERICANA Linnaeus. The mesal plant of Mexico, from which a useful fibre is secured. Pulque, the national drink of Mexico, is produced mainly from this plant, and the juice is also distilled into an alcoholic beverage known by the name of mescal. Thousands of acres are devoted to its cultivation in Mexico, where it ranks with corn, wheat and beans in commercial importance. It makes rapid growth, attaining to a large size, and in the United States is largely planted for its decorative value.

Var. **VARIEGATA** Hort. Large, broad leaves, margined with white, the finest of many forms in cultivation.

AGAVE SHAWII Engelmann. Very compact, dark olive-green leaves, margined with stout spines. Peculiar to the coast region of Southern and Lower California.



FREESIA REFRACTA ALBA.

This long name is become familiar to every lover of flowers in the civilized world. It is a native of Africa and belongs to the Iris family, a family which gives us a multitude of brilliant flowers which readily adapt themselves to Southern California. It will produce a wealth of fragrant bloom the first year from seed, and is so easily grown that it is within the reach of the humblest housekeeper.

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PUBLICATIONS RECEIVED.

BOTANY

Bulletin of the Torrey botanical club:

Vol. i. to v.

" vi.—except No. 6.

" vii. to xv.

" xvi.—except No. 6.

" xvii.—except No. 9 and 10.

" xviii.—except No. 7.

" xix.—except No. 1.

" xx, xxi, and xxii (No. 1-8).

Zoo, v. i. to iv.—end of series.

Erythea, v. i, ii, and iii—Nos 3 & 9.

Botanical gazette, index to v. i-x; v. viii No 11:

v. x to xx.—No. 1 and 2.

Miscouil botanical garden.—Reports for 1890 to 1896

Index Kewensis, parts 1, 2, and 3.

Minnesota botanical studies, Bull. 9, parts 1-6

The botanical club check list: a protest. By

Erwin F. Smith, Washington, D. C., July 22.

HORTICULTURE, ETC.

Southern Kansas horticulturist, v. i. 1-5.

Society of American florists—proceedings, 1896

to 1891.

Agricultural experiment stations:—

Ohio: 3d, 4th and 5th reports.

Bulletins, 2d 8 —1, 2, 3, 5, 6.

Moscow, Idaho: 1st and 2d reports, 1893-'94.

Bull. 1-9.

Knoxville, Tennessee: 5th and 7th reports.
 Bull. vol vii, nos 2-4.
 Morgantown, W. Va.: 1st and 3d reports.
 Bull. 1-23, 25-39, and two special issues.
 Manhattan, Kansas: 1st, 2d, 4th to 7th reports.
 Bull. 10-48, 48, 49 and 51.
 Cornell university: 2d and 3d reports.
 Bul. 1, 3, 6-63, 65-85, 89-96, 98.
 The California florist, vol. i, nos. 1-5, 7, 8; vol. ii.
 Year book of the U. S. Dep't Agric., 1894.
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 883, 964, 988, 1019-1028, 1030-1032, 1034-1240.
 The ural Australian, xlii, 1, 2, 7-12.
 New series, i. 1-5, 0-12; ii. 1-9, 11, 12; iii.
 Garden and Forest, Tribune building., N. Y.:
 Nos. 1-393.

GENERAL

The Swiss Cross, vol. i-v.
 Why I am a vegetarian. By J. Howard Moore.
 Ward Wough Pub. Co., Chicago, 25c
 The Avifauna, Los Angeles, Cal.: i. 1.
 The Monist, a quarterly magazine: i., ii., iii 1, 2,
 3; iv; v. 1, 2, 4.

NOTES ON CACTI.

Dr. W. G. Farlow of Harvard college, kindly
 informs me that Stackhouse spelled the name
 of his genus the same as Haworth—Mammil-
 laria. His genus is identical with Gigartina but
 his name has not been adopted by more recent
 algologists.
 Opuntia basilaris and Parish's variety ramosa
 (see Bull. Torr. Club, xix, 99), when grown in a
 nursery side by side become indistinguishable.

CACTI AND SUCCULENTS.
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<i>reclinata</i>	—
<i>Chamærops excelsa</i>	—

* Correspondence invited about other sorts.

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<i>Dodecatheon Clevelandi</i>	1 0
<i>Emmenanthe penduliflora</i> , yellow bells.....	3 00
<i>Freesia refracta alba</i>	40
<i>Mina lobata</i>	\$ per lb. 70
<i>Lathyrus splendens</i>	1 55
<i>R. mpeya Coulteri</i>	1 00
<i>Dendromecon rigidum: Tree poppy</i>	—
<i>Cobaea scandens</i>	—

* We have handled hundreds of varieties of seeds of which the above are a few specialties.

BULBS.

<i>Allium haematoclyton Watson: fine</i>	Per 100. \$ 1 00
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<i>Behria tenuiflora</i>	7 00
<i>Bloomeria aurea: rich yellow flowers</i>	1 50
<i>Clevelandi Watson: delicate lemon</i>	3 00
<i>Brodiaea capitata: large heads, lavender</i>	1 00
<i>capitata alba: charming, pure white</i>	2 40
<i>congesta: violet purple, 2 to 3 ft. high</i>	1 50
<i>coccinea: Vegetable fire cracker</i>	2 25
<i>grandiflora: dark waxy purple, showy</i>	1 00
<i>ixioides (Calliproa lutea): yellow, pretty</i>	1 00
<i>lactea: white banded with green</i>	1 00
<i>laxa (blue milla, Iturief's spear): blue</i>	1 00
<i>minor: fine royal purple umbels</i>	2 25
<i>multiflora: umbels of violet flowers</i>	1 50
<i>Orcuttii: lavender colored fls</i>	5 00
<i>peduncularis: waxy porcelain white</i>	2 25
<i>stellaris rich purple, white centers</i>	1 50
<i>terrestris: royal purple, 2 inches high</i>	2 25
<i>volubilis: Twining hyacinth, climbing</i>	4 50
<i>mixed varieties \$8 per 1000</i>	90
<i>Calochortus albus: Fairy Bell, pearly w.</i>	1 80
<i>Benthamii: open cup-shaped flowers</i>	2 25
<i>Gunnisonii: light lilac, purple banding</i>	10 00
<i>"Howellii" (apiculatus): white, 2 feet</i>	—
<i>high</i>	6 00
<i>Kennedyi: magnificent dazzling scarlet</i>	10 00
<i>Leichtlinii: much like Nuttallii</i>	3 00

<i>longibarbatu: fine purple, a foot high</i>	6 00
<i>luteus: yellow fls, dotted with brown</i>	1 50
<i>v. concolor: large bright yellow flowers</i>	7 50
<i>lilacinus: lilac shading to purple, fine</i>	1 50
<i>macrocarpus: large purple flowers</i>	4 50
<i>maweanus: white, silky blue hairs, fine</i>	1 50
<i>nitidus: purple and green fls, flexuosus</i>	7 50
<i>nudus: dwarfish in habit, purple fls</i>	4 50
<i>Nuttallii: large white fls, green banded</i>	4 50
<i>Palmeri: a rare and beautiful sort</i>	7 50
<i>pulchellus: star tulip, pendant flowers</i>	1 50
<i>splendens: lavender color</i>	3 00
<i>v. atroviolacea: purple, with red spots</i>	3 00
<i>venustus oculatus: finely marked fls</i>	1 50
<i>venustus purpurascens: purple centers</i>	2 25
<i>venustus citrinus: lemon yellow</i>	1 50
<i>venustus roseus: creamy inside</i>	2 40
<i>Weedii: orange butterfly tulip, fine</i>	4 50
<i>Tolmiei: very large white pendant fls</i>	2 25
<i>flavus (Cyclobothra flava): golden shell</i>	2 00
<i>Plummerae (Weedii purpurascens)</i>	7 50
<i>Purdy Greene: pale lilac fls, new</i>	4 50
<i>flexuosus: lilac fls, a fine butterfly tulip</i>	10 00
<i>Baylardianus: drooping purple and yellow</i>	8 00
<i>mixed varieties, choice selections</i>	1 20
<i>Camassia "alba"</i>	12 50
<i>Cusickii: purple giant, great novelty</i>	25 00
<i>esculenta: dark blue fls, edible bulbs</i>	90
<i>Leichtlinii</i>	7 50
<i>Chlorogalum angustifolium, dwarf size</i>	4 50
<i>parvifolium and pomeridianum, each</i>	4 50
<i>Erythronium grandiflorum (giganteum)</i>	1 50
<i>grandiflorum minor, yellow flowers</i>	6 00
<i>Hartwegii, large yellow fls, beautiful</i>	2 25
<i>Hendersonii, pink fls, center blackish</i>	4 50
<i>montanum, 3 to 4 large pure white fls</i>	1 50
<i>Howellii, white turning pink, Oregon</i>	6 00
<i>Smithii, white fls turning purple</i>	3 00
<i>purpurascens, rare and beautiful</i>	4 50
<i>Freesia refracta alba: seed \$3 per lb</i>	80
<i>Fritillaria atropurpurea</i>	4 50
<i>biflora: chocolate lily, white, purple fls</i>	3 00
<i>coccinea: much like recurva, pretty fls</i>	6 00
<i>lanceolata, curious mottled coloring</i>	3 00
<i>v. gracilis, nearly black, pretty</i>	4 50
<i>lilacea, white, otherwise like biflora</i>	3 00
<i>parviflora</i>	4 50
<i>pubica, charming yellow or orange fls</i>	4 50
<i>recurva, scarlet bell-shaped flowers</i>	3 00
<i>Hesperocallis undulata, desert lily</i>	20 00
<i>Leucocrinum montanum, delicate white</i>	6 00
<i>Lillium Bolanderi, Oregon, quite rare yet</i>	60 00
<i>Columbianum, like dwarf Humboldtii</i>	7 50
<i>Humboldtii, orange, with black spots</i>	10 00
<i>maritimum, blood red flowers</i>	15 00
<i>pardalinum, red and orange</i>	4 50
<i>v. minor, canary yellow, spotted fls</i>	7 50
<i>v. Bourgaei, lustrous fiery red</i>	20 00
<i>Parryi, delicate lemon yellow, fragrant</i>	15 00
<i>parvum, scarlet spotted with brown</i>	12 50
<i>rubescens, opens white, very fine</i>	50 00
<i>Washingtonianum, white, very fragrant</i>	12 50
<i>Mutilla maritima, small whitish flower</i>	3 00
<i>Richardia Africana, calla</i>	4 00
<i>Trillium sessile californicum</i>	3 00
<i>ovatum, white, turning to wine purple</i>	3 00
<i>Zygadenus Fremontii, creamy white fls</i>	4 50
<i>paniculatus, stouter and taller</i>	4 50

C. R. Orcutt, Orcutt, California.

Established 1884.

THE WEST AMERICAN SCIENTIST.

Charles Russell Orcutt, Editor,

Orcutt, Cal., U. S. A.

Price 10c a copy; \$1 a year; \$10 for life.

C. R. ORCUTT, Editor and Publisher,
San Diego, California, U. S. A.
Published monthly at No. 365 21st. St.
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Editorial.

THE PINONE PINE.

Pinus Parryana, a tree unknown far north of the United States boundary, we have recently seen from the mountains of San Bernardino; Mr. R. H. Asher has brought it to us from the San Jacinto mountains also, while its most southern recorded station is in the mountains east of San Quintin bay, where Dr. R. J. Gregg has collected branches and fruit.

NOTES ON MOLLUSKS.

In 1888 I made a small collection of shells at San Quintin bay, Lower California, on some black, volcanic rocks opposite the town site; they were very dark colored, in close imitation of the blackish lava to which they were clinging. The species collected were *Acmaea scabra*, *Chlorostoma funebre*, *Littorina planaxis*, *Lottia gigantea*, *Monoceros lugubre* and *Pallochiton lanuginosa*.

Pupa Sterkiana Pilsbry, Proceedings of the academy of natural sciences of Philadelphia, 1889, 412, apparently as yet collected only by the writer, near San Quintin bay, occurs abundantly on *Rocella tinctoria*; with it was found a smaller species in much fewer numbers, for which Mr. Pilsbry has proposed the (still unpublished?) name of *Pupa Orcuttii*; this has now turned up on saline plants within our city limits. The *Pupa Sterkiana* we may add, has been widely distributed as chordata, to which Mr. Binney referred the shell.

Helix coloradoensis Stearns, we have from the western confines of the desert, in San Diego county—a notable addition to our fauna.

AN OLD-NEW OPUNTIA.

Opuntia Parishii: we propose this name for that interesting plant of the Mohave desert region, hitherto called *O. Parryi*, and under which it has been well described. The Messrs. Parish have hardly earned this light honor in many laborious trips through these desert regions, and I take pleasure in dedicating this species to them; *Opuntia Parryi* (type from San Felipe), along with *bernardina* and *echinocarpa*, and a bewildering host of nameless forms, I unhesitatingly class under *serpentina*!

LIBRARY NOTES.

Eucalyptus, by Abbot Kinney, 1895; B. R. Baumgardt & Co., Los Angeles, 30 plates, 304 pages, \$2.50. An exhaustive treatise, of botanical as well as horticultural value, and describing several new species and varieties; the work contains a vast amount of information also as to the medical properties, uses as bee feed, the oil, timber, etc. of this valuable tree, now so characteristic of California.

Preliminary revision of the North American species of *Echinocactus*, *Cereus*, and *Opuntia*; by John M. Coulter; contributions from the U. S. national herbarium, III, 355-462. We dislike to give space to criticism, but the present work is so full of errors as to necessitate considerable space to enumerate the more glaring ones. Various new names are published, almost without exception based on insufficient material, or plainly referable to well known species; Dr. Engelmiana's name is often quoted as the author of some of these names, where the species had been published by other authors since the death of that noted botanist, thus among the cerei we find *maritimus* and *flaviflorus*; *gabbi*, *cochali*, and *geometrizans*; *calvus* and *pringlei*; *gummosus* and *flexuosus*, etc. Were it possible, the *Echinocacti* are treated

with even less regard for their natural relations, and new names freely indulged in: the *Opuntias* are badly jumbled also—for which there is some excuse.

Chemistry at a glance: a study in molecular architecture. No. 1. 60c. H. B. Tuttle, 131 Lexington avenue, N. Y. The dominant feature of the work is the elaboration and simplification of graphic formulae, by which the character and relation of substances are set forth with increased force and clearness. We hope to see this work completed, and believe it should meet with wide use as a text book.

America's successful men of affairs: an encyclopedia of contemporaneous biography, edited by Henry Hall. The N. Y. Tribune. 2 vol., \$20.00. Volume 1 describes the careers and characters of nearly 1000 of the men most prominent in finance and practical pursuits in the metropolitan district of New York. Vol. 2 is devoted to the master spirits of the business world in the United States at large. The examples of success in this work should prove a strong incentive to the capable youth of America to make the most of their lives, to begin in youth to cultivate habits of thrift and thoroughness, and to lay the sound basis of character, energy and integrity, without which a lasting success is impossible. Wealth is the main element by which the success of these men is estimated, but as a concise history of the millionaires of our day, and the origin of their wealth, the work is worthy of careful study.

Trees of the northern United States: their study, description and determination for the use of schools and private students, by Austin C. Apgar. American book company, N. Y. 224 pp. 8vo. \$1. —A most excellent work, which we can heartily recommend to students in the region covered, which lies east of the

Rocky Mountains and north of southern Virginia and Missouri.

'God protect my little sweetheart' is a charming song, a lullaby, composed by M. Loesch, and just published by J. Fischer & Bro., 7 Bible house, N. Y. 40c.

'Won't you give your love to me,' song and chorus by Paul L. Woirol, comes to hand with the compliments of F. W. Helmick, Union mutual music comp'y, 265 6th avenue, New York, publishers. Price 40c. a copy—half price (20c.) to our music-loving readers.

Biblioteca Botanica-Mexicana, by Dr. Nicolas Leon, issued as a supplement to the *Materia Medica Mexicana*, published by the Nat'l medical institute, is a useful work just received. 372 pp, 8° 1895. Biographical sketches of many writers on the Mexican flora are included in the book, briefly, but the bibliography is incomplete,—so far as recent American writers are concerned, sadly so.

OUR EXCHANGES.

Journal de la societe d'horticulture du Japon, Shintomi-cho, Kyobashi, Tokyo, Japan, is one of our valued exchanges; being printed entirely in Japanese, few Americans will read it.

The Sharon (Pa.) cactus guide, is a new venture appealing to amateurs.

The Baltimore cactus journal has suspended publication—we much want No. 1 and 6 of the first volume to complete our file, and will give any fair exchange.

The Museum, Albion, N. Y., ii, 12, is at hand marked 'x'—shall be glad to swap some back numbers also.

The Review of Reviews: 13 Astor Pl. N. Y., keeps one well informed on the current history of the world, impartially giving both sides of every important question.

Child Garden of story, song and play: 1400 Auditorium, Chicago, is an instructive and pleasing journal for the little ones.

The Youth's Companion, Boston, is replete each week with instructive and entertaining literature—a treat for the old, as well as for the young, folks.

Outing: 239 Fifth av., N. Y., comes to hand each month, full of out door life and recreation, short stories, etc.

The Ladies' Home Journal: Philadelphia, is rich with hints for making the home life pleasant.

The Delineator, woman's favorite magazine, for September, contains 9 beautifully colored plates, including special plates of mourning and bicycle attire, and giving the first authoritative announcement of the coming styles for autumn wear. 7 W. 13th st., N. Y. 15c.

Amateur Gardening: Springfield, Mass. An illustrated monthly, the only horticultural publication in New England, and it goes to all parts of the New England states. Any advertising agent will take your order for advertising in it, or you can send direct to the publishers, Amateur Gardening Co., Springfield, Massachusetts.

Garden and Forest, Tribune building, N. Y., under Prof. C. S. Sargent, is one of the most valuable of the weeklies in America. \$4 a year.

The Garden, 37 Southampton street, London, is the most valuable of the foreign horticultural journals to reach our table, and each weekly number contains a finely colored plate of some flower.

Gardening, Monon building, Chicago, 24 numbers a year for \$2, is an excellent journal for amateurs, now in its 5th vol.

The American naturalist, 518 Minor st. Philadelphia, gives an epitome of the scientific activity of the day.

The bulletin of the Torrey botanical club, Columbia University, N. Y., gives working botanists an indispensable help in its monthly index to recent literature relating to American botany.

Other valued exchanges:—The Amer-

ican florist, Chicago; Florists' exchange, New York; Vick's magazine, Rochester; Strawberry culturist, Salisbury, Md., &c.

NECROLOGY.

Dr. G. Brown Goode, assistant sec'y of the Smithsonian Institution, died Sept. 6, in Washington.

Josiah Dwight Whitney, professor of geology at Harvard University, and once California state geologist, died recently at the age of 77 years.

NOTES AND NEWS.

Prof. Arthur M. Edwards, 11 Washington st., Newark, N. J., wishes to procure some specimens of infusorial or diatomaceous earth deposits—river or marine mud, sea-weed, guano, coral mud, some clays, the darker the better, and recent Infusoria or Diatomaceæ.

Back numbers wanted:—1-11, 20-32, and 66 are needed to complete the files of some of our subscribers, and we will pay liberally for them; those who lack any numbers, please renew application; any scientific institution or public library, becoming a permanent subscriber, can be supplied, except as above, gratis, on request, while our supply lasts.

EXCHANGES.

Books and magazines wanted by the editor; offer same, also cacti, seeds, &c.

IMPORTANT!

THE WEST AMERICAN SCIENTIST derives its entire support from its subscription and advertising patronage, and its present funds are at low water mark! Shall it be 4—or 32—pp. a month?

We heartily thank our numerous exchanges for courtesies extended to us.

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Allgemeine botanische Zeitschrift für Systematik, Floristik, Pflanzengeographie, etc. Unter vorstehendem Titel erscheint seit Januar 1895 unter Mitwirkung einer Reihe namhafter Botaniker ein neues botanisches Fachblatt, welches, wie schon der Titel sagt, vor allem den Bestrebungen der Systematik, Floristik und Pflanzengeographie gewidmet ist. Dasselbe bringt Abhandlungen über schwierige Pflanzengruppen, Diagnosen kritischer Arten, Formen und Bastarde, Schilderungen floristisch und pflanzengeographisch interessanter Gebiete, botanische Reiseberichte, Referate, Berichte über die Thätigkeit botanischer Institute, Vereine, Tauschvereine, etc.; Biographien verdienter Botaniker, biographische Notizen, Anzeigen, etc. Die „Allgemeine botanische Zeitschrift“ erscheint punktlich am 15. jeden Monats geheftet und mit Umschlag versehen in der Stärke von 1–2 Bogen, kostet pro Quartal 1,50 Mk. und wird den Abonnenten portofrei unter Kreuzband zugesandt. Probe-Exemplare stehen auf Verlangen gratis zur Verfügung. Der Herausgeber: A. Kneucker, Karlsruhe i. Baden. Werderplatz 48. Verleger: J. J. Reiff. [ad]

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West American Scientist.

Vol. X. No. 82. November, 1897.

give the purchaser such a variety as he never dreamed possible.

Descriptive List of New and Novel Californian Bulbs.

CARL PURDY.

BRODIAEA BRIDGESII. This is a rare species resembling *B. laxa*, but with a more bell-shaped tube, and larger flowers. Very handsome.

B. IXIODES VAR. ERECTA. A form with plants about 3-6 inches high, and light yellow rotate flowers. *B. scabra*, of Greene, is the same, with black bands.

B. HENDERSONII. This rare species, from southwestern Oregon, has pale yellow flowers, resembling *B. laxa*.

B. PURDYI. Described and figured in *Proc. California Acad. Sci. ser. II. vi.* The leaves lay flat on the ground. The habit is that of *B. grandiflora*. The large waxy flowers of a reddish purple color spread rotately from a short constricted tube. It is one of the handsomest of the genus. There is also a pure white form.

B. DOUGLASII. This is the connecting link between the type of *B. Howellii* and *B. laxa*. The large flowers have the porcellain caste of *B. Howellii*, but are bluer. At its best it grows larger than the largest *B. laxa* plants, and forms a grand plant. I can recommend it highly.

EL DORADO STRAIN OF CALOCHORTI. I cannot say too much in favor of this truly wonderful strain of Mariposa Tulips. The range of colors is marvelous, and in its exquisite tints no other *Calochortus* rivals it. Some of the reds excel *C. Kennedyi*, and from pure white to claret there is an endless variation. There are also forms with gold blotches, and red blotches, and a few suffused throughout with gold on a white ground. A few hundred of the mixed bulbs will

C. CLAVATUS. In this species, for the first time offered, I can give something entirely new in *Calochorti*. The leaves are from a foot to two feet long, and lay flat on the ground. The stem is very stout, 2-4 feet high. The stem and leaf are a bluish green. The immense golden yellow cups, 3-6 inches across, are lined with yellow hairs and each hair is tipped with a transparent club-shaped point. In the light it is as if the interior of the flower were a mass of tiny icicles.

C. INVENUSTUS. This is a species between *C. Nuttallii* and *C. splendens*, with pale lilac flowers of a smoky tinge. The stem is stiff and stout, and the flowers borne in an umbel. I distributed a few in 1894 erroneously as *C. Palmeri*.

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ERYTHRONIUM NUTTALLIANUM (E. grandiflorum, var.) This is a beautiful species, from eastern Oregon, with unmottled leaves and flowers of the clearest and brightest buttercup yellow.

E. REVOLUTUM. This is a splendid species, occurring in several forms. *E. revolutum var. Bolanderi*, better known as *E. Smithii*, is one of them. The type is a one- or few-flowered species, with creamy yellow flowers which do not recurve to the stem as in *E. giganteum* (*E. grandiflorum* of the trade). A beautiful thing.

E. revolutum, white form. This is a lovely thing, better known as *E. grandiflorum var. albiflorum*, or *E. giganteum var. albiflorum*, and figured under that name in the *Botanical Magazine*, and chromo-lithographed in Krelage's colored plates. It is in leaf and habit exactly like the creamy type, but in color a pure white with a slight greenish caste and orange center. One of the very finest of *Erythroniums*.

E. PURPURASCENS. I have at last a form of this species which flowers with *E. giganteum* and can be grown successfully in cool places. The bulbs grow large. The leaves are handsome, unmottled, purplish green in color. The several flowers in a close raceme, white with orange center, and soon turn pinkish purple.

FRITILLARIA MULTIFLORA. This rare sort, described and named by Dr. Kellogg, resembles *F. lanceolata* in its large bulbs and broad radical leaves. The stem leaves are narrow, the flowers small, unmottled, yellow or a brick red.

F. PLURIFLORA. I can highly recommend this beautiful species. In bulb and leaf it resembles *F. liliacea* and *F. biflora*. The flower is large, of a clear red, banded with dark red, and next to *F. recurva*, the handsomest of any *Fritillaria*. It flowers fully two months before any other species, and is very easily grown. In flower January 1st.

LILIUM HUMBOLDTII VAR. *MAGNIFICUM.* This grand lily is far superior to the type of *L. Humboldtii* as a garden plant. It has a large bulb, dark green leaves and stem, and grows 4-8 ft. high. The ground color of the flower is dark orange; the maroon spots are ocellated with red, and toward the apex the red ocellations run together. Good bulbs of this flower the first year—which *L. Humboldtii* seldom does.

L. BOLANDERI. This is a rare lily, with bulb and habit similar to *L. Columbianum*, and an ascending clear red flower of much beauty.

L. PARVUM VAR. *PARVIFLORUM.* In this lily we have the bulb and habit of the typical *L. parvum*, with flowers which tend to become more or less revolute. In the typical *L. parvum* the flowers are funnelform.

TRILLIUM PETIOLATUM. This is a species with the lovely pure white flower of *T. ovatum*, and a much stronger

bulb and habit. I predict that when known it will quite supercede *T. ovatum* and *T. grandiflorum* in cultivation.

ZYGADENUS FREMONTII. This is a very hardly large flowered species, which I think quite worthy of cultivation. Several forms are called *Z. Fremontii*, but the one I grow is quite superior to the others in size of flower.

COTEEMPORARY JOURNALS.

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The Delineator, woman's favorite magazine, contains beautiful plain and colored plates and over 100 pages of descriptive of the latest manners and fashions. 7 W. 13th street, N. Y. 15c

Child Garden of story, song and play: 1400 Auditorium, Chicago, is an instructive and pleasing journal for the little ones.

Amateur Gardening: Springfield, Mass. An illustrated monthly, the only horticultural publication in New England.

Psyche, a journal of entomology, by the Cambridge (Mass.) entomological club, commenced its 8th volume with the year [\$2 per annum. \$5 per volume].

Press and Horticulturist, Riverside, Cal., is one of our weekly visitors.

Monthly bulletin of the National Wool Growers' Association.

Pacific Ensign.

American florist, Chicago;

Womankind, Springfield, O.

Farm and Fireside, Springfield, O.

Farm News, Springfield, O.

Florists' exchange, New York;

Vick's magazine, Rochester;

Strawberry culturist, Salisbury, Md.

REVIEWS.

Suksdorf, W. N.: Die Plectritideen. Deutsche botanische Monatsschrift, 1897. Plectritis macrocera T. & G. is made the type of a new genus, and several new species described under the name Alligera.

Wintle, Ernest D.: the birds of Montreal. 281 pp. 8° \$1.25 A work which any sporting naturalist will enjoy, with notes on 254 species and the addition of sporting sketches.

Our new president's march, composed by Juliet S. Norton, and dedicated to the Republican party, has just been received from the Union mutual music company, 265 6th ave., N. Y. 50c.—25c to our sub's.

SOCIETIES.

SAN DIEGO SOCIETY OF NATURAL HISTORY: annual meeting, November 6, 1896.—T. S. Brandegee, Reverend John D. Parker, G. W. Dunn, Ellwood P. Cumberly, Dr. F. Baker, Miss Lena Polhamus and Miss Minnie Reed were elected to membership; Professor Arthur M. Edwards, 11 Washington street, New Jersey, was elected a corresponding member. Officers elected for the ensuing year:—D. Cleveland, president; Mrs. I. Phillips, vice-president; and H. Hemphill, T. S. Brandegee, and J. G. Capron, additional directors; Theo. Fintzelberg, treasurer; John D. Parker (1313 6th st.), secretary. Reports on the lease of real estate, and by the treasurer, presented.

LOUISIANA SOCIETY OF NATURALISTS is a new organization, whose secretary, E. Foster, P. O. box 405, New Orleans, sends the constitution and by-laws, and reports 45 charter members.

NOTES AND NEWS.

No. 81 was issued Nov. 7, 1896.

Botanists are requested to communicate with Samuel M. Maxwell, U. P. Headquarters, Omaha, Nebr., for forming a bureau for the distribution of the plants of widely separated localities.

Out of Doors for Women has been discontinued, this magazine assuming its obligations to subscribers and others. Back numbers can be supplied at 5c. as follows:—1-3, 6-9, 11-29; of 4 and 5 we wish copies for a correspondent and will give a liberal price in exchange.

We buy, sell and exchange for every description of printed matter.

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30 cents per line each insertion.

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San Diego, California, U. S. A.

Published monthly at No. 365 21st St.
Price 10c a copy; \$1 a year; \$10 for life.



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Baltimore cactus journal, i, 1.

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January, 1899.

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<i>cobrinus</i> , cuttings 6 inches long \$10	25
<i>dasyacanthus</i> , very handsome, large	\$60
Emoryi, large established, \$3; smaller	15
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<i>giganteus</i> , 1 to 2 ft high	100
<i>grandiflorus</i> , cuttings	5
<i>gummosus</i>	100
<i>maritimus</i> , small \$25; clusters	75
<i>mexicanus</i> , single heads \$40; clusters	70
<i>napoleonis</i>	—
<i>nycticalus</i>	—
<i>polyacanthus</i>	50
<i>procumbens</i>	8
<i>rikiidensis</i> (eandicans), small \$20	100
<i>Sargentianus</i> , small \$30; specimens \$10	\$260
<i>stramineus</i> , specimens up to \$50 each	15
Thurberii—pitalla dulce	—
<i>tuberosa</i> , few in stock	19
<i>variabilis</i> (<i>princeps</i>)	16
<i>viridiflorus</i>	20

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 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.

<i>Echinocactus bicolor</i>	15
<i>brevihamatus</i>	15
<i>chrysanctus</i> ("Emoryi var.") medium	10
<i>coptonogonus</i>	20
<i>cornigerus</i> and varieties, \$10 to	40
<i>crispatus</i>	1—
<i>cylindraceus</i> , collected to order, \$20 to	—
<i>electracanthus</i>	35
Emoryi true	75
<i>erectocentrus</i>	150
<i>horizontalis</i> , \$10 to	40
<i>intertextus</i> v. <i>dasyacanthus</i>	75
<i>lecontei</i> (California), \$20 to	90

Typical form from Arizona	90
<i>longibarbatum</i>	20
<i>lophothelae</i>	20
Mc Dowellii, few only	60
Orcuttii, \$30 to	\$125
<i>peninsularis</i>	\$100
<i>polyacanthus</i>	\$200
<i>polycephalus</i> , small \$4; clusters \$10 to	\$40
Scheeri	12
<i>setispinus</i>	10
<i>Texensis</i>	—
<i>viridescens</i> , \$5 to	60
<i>whipplei</i>	—
<i>Wislizeni</i> , small collected plants \$20 to	30
<i>Wrightii</i> (<i>imbricatus</i> var.), \$5 to	\$30

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.

<i>Echinopsis Byrnesii</i>	10
<i>Mullei</i> , small \$5 to	7

MAMMILLARIA GOODRICHII Scheer. A 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 "chep-pitalas," the "llavina" of the Mexicans.

MAMMILLARIA GRAHAMII 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.

MAMMILLARIA MINIMA Reiche. 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.

Advertisements:

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Alversonii	7
Arizonaea	10
boobata	25
densisoma (cactus densispinus Coulteri)	150
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echinus	8
egans, extra fine plants, \$10 to	50
Gabbii collect to order	100
Grahamii	11
Hadel Brandegeae	10
macromeris	15
miniata	15
nivea—the few in store worth	10
phellosoma, becoming rare, fine ones	750
pusilla	5
tuberculosa, \$5 to	50
uncinata, two forms	25
Pel-eyphora aseiformis, \$20 to	60
NOPALEA AUBERI Salm-Dyck. A Cuban cactus, of rapid growth, assuming a tree-like form, and bearing numerous rose-colored flowers with exserted stamens; the branches armed with stout spines; readily grown from cuttings.	
Nopales Aubri and N. coelestifera	15
Opuntia (100) varieties	20

OPUNTIA BASILARIS Engelm. & Bigelow. Low; joints 5 to 8 inches long, triangular, proflerous from their base, pubescent, unarmed, but beset with numerous dense fascicles of short brownish bristles, as is also the bark. 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.

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OPUNTIA OCCIDENTALIS Engelm. A Prickly Pear of luxuriant growth, with stout woody stems and innumerable branches; joints 7 to 12 inches long and 6 to 8 inches across; flower yellowish and orange; fruit 2 inches long, very sour and juicy.

OPUNTIA PROLIFERA Engelmann. This densely-branching shrub bears a small flower of a pomegranate purple, and once grew in great abundance where the city of San Diego now exists.

OPUNTIA SERPENTINA Engelm. Prostrate, with yellow flowers, comparatively rare in cactus collections.

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PELECYPHORA ASSELLIFORMIS Nuttall. A tree 60 feet in height, all trees are owing to the loss of a tree, and a quarter of a century ago. The tree is colored in the middle of the trunk is one to three inches long, followed by deep brilliant red berries, such as an eye-rolling wax-like substance that is even more hot than the pleasantly acid berries. These berries make a cooling drink, and to be made into a medicinal drink.

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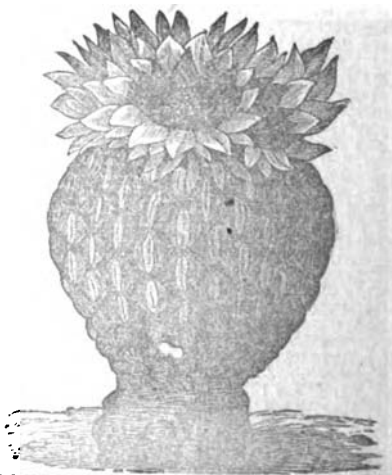
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PELECYPHORA ASSELLIFORMIS Nuttall.

West American Scientist

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Whole No. 83.

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 carnosus absque axe ligneo, lactescens 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 Mamuna, 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 brevina pauca flavida longe excedantibus flavis; baccis elongato-clavatis; seminibus subgloboso-ovatis scrobiculatis rugulosis parvis.—Rocky plains on the Piedrales; 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. BENECKE Ehrenberg.

"Stamm cylindrisch, meistentheils aber schief abgestumpft, nabelformig 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. Hr. 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, io, 91.

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

Original description not seen.

"Depressa, ovata, s. cylindræa, 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 cuspидatis 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, 8, 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. Orion 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 ASSELLIFORMIS Ehrenb.

West American Scientist

Volume XI.

January 1900.

Whole No. 84.

THE METRIC SYSTEM.

BY GEORGE S. HODGINS, KINGSTON, ONTARIO.

There seems to be a sentiment existing in the minds of many persons, both in England and America, that an appropriate rounding up of the nineteenth century would be had in the compulsory adoption of the metric system of weights and measures. This is essentially a scientific age, and the last fifty years has been marked by so many startling improvements in modes of transportation, in means of communication at a distance, in the development and utilization of the forces of nature for man's service—in short such strides have been made in all the arts of peace and war, that a large section of the community appear to regard the adoption of this system as the one thing needful to fitly crown the scientific achievements of our progressive age.

The metric, or decimal system of weights and measures was devised by the French savants of the First Republic. It was born in an era when the obliteration of old landmarks and established customs appears to have been more an object, than the careful introduction of valuable improvements. The poetical names given to the new months into which the year was then divided—Vendémiaire, Brumaire, Frimaire, Nivose, Pluviose, Ventose, Germinal, Floréal, Prarial, Messidor, Thermidor, Fructidore, and Sansculottides,—have survived only in history, as marking the ephemeral growth of those troublous times. Each month was then divided into three decades; each tenth day being set apart for rest, and not in any way for religious observance as Sunday had been. Napoleon in 1805 forced the nation to return to the old established, though more prosaic year, as we know it.

The French metre was, at the time of its introduction believed to be an exact earth commensurable quantity. It was intended to be the one-tenmillionth part of the distance which stretches from the pole to the equator measured along the surface of still water. It has since been proved that its supposed exact division of this quadrant, was a mistake. It is probable that if the work

of settling upon a unit of length had to be done over again, a new length of metre would be the result. The mistake then made, appears to have been owing to the assumption that the earth's equator was a perfect circle, and not, as it is now believed to be, more or less irregular, or somewhat elliptical in form. This latter view necessitates the adoption of differing length for the half meridians or quadrants of all great circles passing through the poles. When speaking of the choice of the meridional quadrant as the line from which to derive the unit of measure, Sir John Herschell has said:—"So long as the human mind continues to be human, and retains a power of geometry, so long will the diameter be thought of more primary importance than the circumference of a circle." That learned astronomer further affirmed that the action of the French savants, was in this particular:—"not a blunder only; it was a sin against geometrical simplicity." The axis of rotation of our earth is certainly the principal, and the one fixed line which suggests itself as the more truly scientific one, from which to derive a unit of length. The half meridian drawn through Paris probably differs in length from that passing through London, Washington, or indeed any other national capital. The French metre is based upon the division of a curved line, and not upon a straight, or what in geometry, would be called a right line.

Piazza Smith, at one time Astronomer Royal for Scotland, has shown that the inch is the smallest unit of measure used by the architect of the Great Pyramid of Egypt,* and that this Pyramid inch is longer than the British inch by the one-thousandth part of the latter, or about half a hair's breadth. In other words the Pyramid inch equals 1.001 British inches. He further shows that the British inch in the reign of Queen Elizabeth, was longer than at the present time, by a quantity almost exactly that required to make the British and Pyramid inches identical. The Pyramid inch, he affirms, is the one-five hundred millionth part of the earth's axis of rotation. The British inch, so familiar to both the great Anglo-Saxon peoples was in all likelihood derived from that of the Pyramid of Joseph, if the learned astronomer's opinion is to be believed. He says on page 40 of his work:—"We have thus arrived by a comparatively short and easy path, and

*Our Inheritance in the Great Pyramid, by Piazza Smith. F. R. S. E., F. R. A. S., edition 3, London, 1877—Daldy Isbister & Co.

“dealing only as yet with the externals of the monument, at the same chief result touching the Great Pyramid’s standards and units of linear measure, and a probability of whence the British inch was derived in primeval days of purity and patriarchal worship before idolatry began.—” It is this fact which is probably alluded to by a writer in the London Times of April 4, 1896 when he quotes Sir John Hershell to show that:—“The increase of the standard yard and its multiples and sub-multiples by one-thousandth of their present lengths would give us an ideally perfect system of linear measure, and rescue our weights and measures of capacity from their present utter confusion.”

It is said on good authority,* that the British yard as a standard of length is not established by law in the United States. The same authority asserts that the United States yard as determined by the coast survey is one-hundred thousandth longer than the British yard, so that the United States inch would be longer than the British inch by one-hundred thousandth of its length. This is a distance which is far less than the breadth of the fine lines on a steel rule used to divide one inch from another, and is therefore practically disregarded. The British inch, foot, and yard, are then, identical with similar measures of length used in the United States.

The British and United States foot, the English shilling, each divided into twelve parts, the twelve hours of the working day as shown on the dial of the clock, the twelve months of the year, the proverbial round dozen, have all much to recommend them and their system of division, outside the fact that long established use has rendered them so familiar to all classes. The number 12 is divisible by more whole numbers than is the number 10. The factors of 12 are 2, 3, 4, and 6, while those of 10 are 2 and 5. Among the factors of 12, 2, 4, and 6 are each divisible by 2, and 6 is again divisible by 3. The balance of advantage between the unit composed of 12 equal parts, and the unit of 10 is that the ten-part unit lends itself readily to computation, but in every other operation the weight of advantage lies with the 12-part unit. The same may be said of the binary division of the inch which is so largely used in all the handicrafts. It is in fact the ease with

*The Standard Dictionary of the English Language, New York: Funk and Wagnals Company, 1895.

which the number 12 lends itself to binary division up to a certain point, which makes it popular with all classes who have to deal with one another in the disposal of quantities in small number.

The English pound weight was originally the weight of 7680 grains of wheat, all taken from the middle of the ear and well dried.* The division into sixteen ounces is again an example of the binary division of the unit in preference to that of the decimal.

Any change from the authorized standards of length, surface and weight would fall most heavily upon the manufacturing community. Bars of iron and multitudes of other commercial commodities are made in certain definite sizes, and advance by regular fractions of the inch. These sizes if expressed in metric decimals would be exceedingly awkward to use. If articles were made to fractions of the metre, it would necessitate similar changes in the calculations and requirements of the consumer. The mechanical equivalents, such as the well known foot, pound, and the horse power, (33,000 pounds raised one foot high in one minute,) would disappear and the gram-centimetre, or some such standard to indicate pressure acting through space—the mathematical conception of work,—would take the place of these.

The fact of the incorrectness, from a scientific point of view, or the geometrical impropriety of selecting any meridian from which to deduce the metre, has very little weight with most people. It is now a question whether the already devised and existing French metric system shall be universally adopted or not.

The metre † as defined is 39.37 British or United States inches. It is divided into ten equal parts called decimetres; each 3.937 inches long. Each decimetre is again divided into ten equal parts called centimetres, each 0.3937 inches long. Each centimetre is divided into ten millimetres, each .03937 of an inch. The multiples of the metre are first, the decametre, a distance made up of ten metres, and equal to 32.8 feet. The hectometre is 10 decametres or 100 metres, and measures 328.08 feet. The kylo-metre, 1000 metres, equals 1093.63 yards; and the myriometre made up of 10,000 metres is equal to 6.21 miles. The fractions of the metre, and indeed all the metrical fractions, use the Latin prefixes, while the multiples use the Greek.

*Chamber's Encyclopædia, London, 1860.

†Lessons in Elementary Chemistry by Henry E. Roscoe, B.A., F.R.S., London: Macmillan & Co., 1875.

The measures of surface are of course derived from those of length. The unit of surface is the Are which is formed by squaring the decametre; it contains 100 square metres and is equal to 1076.42 square feet. The Hectare equals 10,000 square metres and contains 2.471 English acres.

The measures of capacity, like those of surface, are the result of multiplying the measures of length. The unit of capacity is the litre, and is produced by cubing the decimetre. The litre is therefore a cube whose side measures 3.937 inches, and is consequently very close to the English quart. The decalitre is composed of 10 litres and is also called a centistere. The hectolitre or decistere contains 100 litres. The measures composed of 10 or 100 litres do not make up into larger cubes themselves, they are simply aggregates of the unit. For example, 10 or 100 wooden blocks each one the size of a cubic decimetre, or litre, cannot be built up into a cube. It is not until we come to the kyloitre or 1000 litres that we have the cubic form again. The kyloitre is the cubic metre and is also called the score. The myriolitre or decastere is simply an aggregate of 10 cubic metres or 10,000 cubic litres. The fractional parts of the litre present the same features as do the multiples. The millilitre is the one thousandth part of the litre and is the cube of the centimetre.

It is this cubic centimetre which forms the base from which the unit of weight is derived. One cubic centimetre or millilitre of pure distilled water at a temperature of 39.2 degrees F., or 4 degrees C. (the point when water attains its maximum density), weighed in vacuo,* is the gram weight. The myriogram equals 22.046 lbs. avoirdupois. The myriogram multiplied by 10 is called a quintal, and the 100-myriogram is the millier, or metric ton. Both these words are used without the Greek prefixes for one hundred thousand, and one million. The prefixes if united with gram would produce very long and somewhat confusing words. The expression for the 100,000 gram would, if made up of the proper components, probably be decakismyriogram.

Those who advocate the introduction of the metric system should remember that the handicraftsman will be the one upon whom the inconvenience of the change will press most heavily. It

*Page 250, *Our Inheritance in the Great Pyramid*, by Piazzi Smith, edition 3, 1877.

is almost impossible to transform all the existing standards into fractions of the metre and its derivatives. The existing standards must disappear in order to make way for the new. An instance will suffice for illustration. The number of screw threads to the inch now standard (the Whitworth system in England, and the Sellers in the United States) must be altered entirely if a definite integral number of threads to the centimetre are to be cut upon bolts and in nuts. The sizes of iron and steel bars, and the thickness of boiler plates, as manufactured, must be changed, together with the standard sizes of gas pipes and tubes of all kinds. Gas pipe threads, like those of bolts and nuts, would have to be made to conform to the new standards or long and confusing decimal fractions would have to be used, and indeed memorized, if old sizes were transformed into the language of the metric system.

The introduction of new sizes for the manufacture of bolts, nuts, iron and steel bars and plates would certainly avoid the use of awkward sets of figures but it would require the abandonment of large quantities of stock now on hand throughout the country, together with an enormous amount of machinery used for producing the hitherto standard and marketable sizes of various materials. The advent of new sizes and standards would hamper the facility with which repairs to existing structures and machines can be made.

The ramifications of such a change are almost limitless, and the number and variety of interests which the change would touch is well nigh infinite. There is no doubt that a certain unification of methods for measuring, weighing, etc., would be advantageous, but it is certain that the metric system does not fully fill the requirements for a perfect and universal system of measuring and weighing.

The metric system, while it can be, and is, used in scientific work with great facility, does not lend itself at all readily for daily use by the bulk of the people who are engaged in buying and selling articles or substances in small quantities. A fifth or a 10th will never be as popular as the half and the quarter in retail business. It has been said that the French people never discovered the alleged advantages of their own system, and that their opposition to it only disappeared after the compulsory adoption of the system had removed all free choice in the matter from them.

The standard unit of weight might with advantage, be one which would be more easily within the reach of the unscientific than it is now. A certain quantity of pure water weighed in the air, at normal and easily obtained temperature, with normal barometric pressure, and given correction for locality, would perhaps be more serviceable, for ready verification, and correction of weights, than the metric volume of water, at a temperature close upon freezing, and experimented with in that physical state, so difficult of production—the entire exclusion from the atmosphere.



CATALOG OF FOSSILS IN THE ORCUTT COLLECTION.

1	<i>Ostraea lurida</i> Cpr.	1
2	<i>Tellina Gouldii</i> Hanl,	1 valve.
3	<i>Mactra</i> ———?	”
4	<i>Liocardium elatum</i> Sby?	Fragment.
5	<i>Chione simillima</i> Sby.	9 valves.
6	<i>Lucina nuttallii</i> Conr.	12 ”
7	<i>Janira</i> ———?	5 Fragments.
8	<i>Pecten</i> ———?	14 valves.

Nos. 1—8 were collected by C. R. Orcutt, Nov. 28, 1887, from a stratum one or more feet thick, five feet below the surface, exposed by the grading of the street at the southwest corner of G and thirteenth streets, San Diego, California.

Nos. 9-15 were collected at Burlington, Iowa, by Enoch May, Sr., and received in exchange.

9 “*Majesticrius*.”

10 *Teliformis*.

[All names as received—having no means of correcting errors.]

11 *Ammonite*.

12 *Strocotimus*,

13 *Platicrinus*,

14 *Pentemite*. 5

15 *Crimoids*. 18

16 *Helix bermudensis*, Bermuda—from D. W. Ferguson.

17 *Cidaris*, Holy Land, from Hon. E. M. Goodwin.

18 *Spirifer oweni* Hall. Upper Devonian, Watson station, Ind. from W. B. Lighton, collector, 1887.

No. 19-22 were collected at Punta Banda, on the south side of Todos Santos bay, Baja California, by H. C. and C. R. Orcutt, in 1885 (with *Coralliochama orcutti* White). Cretaceous.

19	<i>Cerithium pillingi</i> C. A. White.	142
20	" <i>totium-sanctorum</i> C. A. White.	22
21	<i>Nerita californiensis</i> C. A. White.	12
22	<i>Trochus (Oxysteles) euryostomus</i> C. A. White,	24
23	Baculite	Cheyenne river, from L. W. Stilwell. 1
24	<i>Pentremite elongata</i> . [This and the next with 9-15.]	1
25	Crinoid stems.	9
26	— — —	
	St. Louis group, subcarboniferous, Madison Co., Ill.	7
27	<i>Archimedes</i> — — — Keokuk group, last locality.	2
28	Crinoid stems, Ill.	11
29	<i>Discina nitida</i> , Carboniferous. Jersey Co., Ill.	1
30	— — — Ill.	6

No. 31-34 from sewer trench, 6 feet below the center of 2d street near A, San Diego, Cal. coll'd by C. R. Orcutt Ap. 16, 1889.

31	<i>Turritella</i> — — —	4
32	<i>Chione fluctifraga</i> Sby.	1
33	— — — <i>simillima</i> Sby.	2
34	— — — <i>succincta</i> Val?	1 valve.

No. 35-38 from sewer trench 6 feet deep corner 12th and H streets, San Diego, Cal. collected by C. R. Orcutt.

35	<i>Anomia lampe</i> Gray,	1 valve.
36	<i>Chione</i> — — —	2
37	<i>Ostrea lurida</i> Carpenter.	5
38	? 1	
39	Silicified wood from foothills near Santa Rosa, Sonoma Co., Cal. collected by Edgar Cherry. A rare variety.	2
40	Same, a rare variety more nearly agatized.	3
41	Same, different form.	2
42	" " " "	2

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RARE OR USEFUL MINERALS.

(By courtesy of the San Diego Daily Union.)

One hundred years ago a few patient burros were engaged in carrying ore from various primitive mines to rude smelters, for the various missions throughout the Californias. Gold was unknown from our mines; silver was king. Tradition tells of numerous points, some within the immediate vicinity of San Diego, as having yielded fabulous wealth to the ancient workers, but little more tangible than vague fancy tales can be produced in verification at the present day.

Before the expiration of the first half of the nineteenth century gold had been discovered in California, and a steady stream of prospectors and travelers crossed the arid plains of the Colorado desert and the fertile valleys tributary to San Diego, eager to reach the new El Dorado, and passed, unseeing or uncaring, over wealth a hundred fold greater than that enumerated in the fables of tradition.

Another quarter of a century saw the continent banded with iron. Unparalleled activity in gold and silver production followed. Quartz mills and smelters succeeded the gold pans, and mining assumed its proper role of a legitimate business.

But the last quarter of the century has been most prolific in the material advancement of our mining industries, until today California stands in the front rank of producers. With the opening of the twentieth century the future looks bright. The revival of business in nearly all lines of trade, the steadily increasing demand for all the metals,

which seeks new sources of supply in the face of the cheapening of production, augurs well for the miner in a region rich in natural resources like Southern California.

Twelve years ago the writer contributed to the San Diego Union a brief annotated list of the minerals then known in San Diego county. The county has that may add to the importance of our future industries. The writer aims to give a conservative estimate of values, and to avoid exaggeration—the bane of mining enterprises.

Since the discovery of the Julian gold mines about thirty years ago, San Diego county has produced more than ten million dollars in gold. The history of the various mines which have produced their sum would be interesting and instructive, but must be left to some other pen. The Lithia mines of the county—probably the largest and richest in the world—considered valueless two years ago, have through the efforts of the present writer and his associates, become producers within the past year, and broken into the monopoly previously enjoyed by Germany, whose exports to this country have averaged a ton daily. The kaolin deposits at El Cajon mountain promise to develop into a healthy industry. A sale of 200,000 tons of ore from the iron mines in Baja California, shipments of salt, and other developments in copper, lead, etc., all tributary to San Diego, are all elements in favor of a hopeful feeling.

ACTINOLITE—Abundant in the Colorado desert.

ALABASTER—An abundance of apparently good quality of this form of

gypsum occurs on the Colorado desert, and in Baja California.

ALLANITE—Named for T. Ailen, who discovered it among minerals from East Greenland, contains the rare metals cerium, didymium, glucinum, lanthanum, and yttrium, together with alumina, silica, lime, and iron, with traces of magnesium, manganese, soda, copper, and water. This occurs in Pennsylvania, New Jersey, and in Southern California.

ALUM—See kalinite.

AMBLYGONITE—Associated with lepidolite in the lithia mines of the county.

ANGLESITE—Sulphate of lead has been reported from the Colorado desert in some abundance; composition about 73.6 per cent aside of lead, and 26.4 per cent sulphuric acid.

ANTONITE—A talc-like mineral, discovered in a copper mine at San Antonio, Baja California, not far from Todos Santos bay. It was formerly shipped to New York and used in the manufacture of decorative papers.

Dr. E. O. Hovey, of the American Museum of Natural History, writes:—

"I find no such name as antonite in Dana's System of Mineralogy, 1892, 6th ed., or in the Appendix thereto, 1899, or in Foote's Complete Mineral Catalogue, 1899. The mineral on merely superficial examination looks to me like some form of sericite."

ARAGONITE—Named for Aragon, Spain, identical in composition with calcite, but harder and crystallizing in prismatic forms. Colorado desert.

ARGENTITE—Silver glance is composed of about 87.7 per cent silver and 12.9 per cent sulphur. One of the most valuable of silver ores.

APATITE—Phosphate of lime has been reported from the property of the San Jacinto tin mining company.

ASBESTOS—A four-foot vein seven miles east of Elsinore, Cal., has been worked to a considerable extent, and the product manufactured into boiler covering, etc. Other deposits exist in the mountains bordering the Colorado desert on the west, but the demand on

this coast seems not to justify their development at present.

ASPHALTUM—Occurs native at various points along the coast from San Diego northward. California produced in 1896 nearly 75,000 tons, worth about half a million dollars.

The notion of making asphalt artificially from herrings and sawdust seems so extraordinary as to suggest burlesque. Nevertheless, this surprising feat has been accomplished by Prof W. C. Day.

ATACAMITE—A native exchloride of copper, originally found in the form of sand, in the desert of Atacama, between Chill and Peru. A specimen received of Emilliano Ybarra from a mine near Calmalli, Baja California, is identified as this species.

AZURITE—"Mountain blue" (blue carbonate of copper) occurs sparingly in some of the copper mines of Southern California. One of the most beautiful of copper ores, magnificent specimens of which have been produced by the copper mines of Arizona. Composition about 69.2 per cent copper oxide, 25.6 per cent carbonic acid; and 5.2 per cent water.

BARITE—Barytes or heavy spar is composed of about 65.7 per cent baryta and 34.3 per cent of sulphuric acid. The present supply in the United States is excessive of the demand.

BIOTITE—Black mica occurs in various localities in Southern California and in Baja California.

BOLEITE—A rare mineral described from the copper mines at Santa Rosalia, Baja California, on the west coast of the Gulf of California. Occurs in perfect cubes.

BORAX—Originally obtained from a lake in Thibet; composition about 36.6 per cent boric acid, 16.2 per cent soda, and 47.2 per cent water. Of a white color, sometimes grayish, or with a shade of blue and green. The deserts of California and Nevada produce annually about half a million dollars' worth, the product in 1896 being 13,508,000 pounds, worth \$675,400.

CALCITE—Carbonate of lime, consisting of lime and carbonic acid. Rhombohedral in crystallization. Includes marble, limestone, calcareous tufa, etc. The cement rock of San

Diego county (notably in Jamul valley) is a form of calcite, especially adapted for the manufacture of cement. Thino-lite, occurring on the Colorado desert, is another form.

Limestone occurs abundantly in various places in Southern California, and is mined at Colton and San Jacinto.

Marble occurs in San Diego county in various colors, but the quarries are as yet wholly undeveloped. Some delicate yellow marble—the most highly prized color among the ancients—occurs on the Colorado desert.

Ophiolite, or Verd-Antique marble, occurs on the Mojave desert, where large quarries of this beautiful and highly prized ornamental stone have been partially developed.

CERARGYRITE — "Horn silver" (chloride of silver), composed of about 75.3 per cent silver, and 24.7 per cent chlorine, weighs 345 pounds per cubic foot, 5.8 cubic feet making a ton.

CHALCOPYRITE — Copper pyrites exist in large deposits in Baja California, and a mine of this ore is now being developed near Encinitas.

CHRYSOCOLLA—Silicate of copper, composed of 45.2 per cent copper oxide, 34.3 per cent silica, and 20.5 per cent water. Beautiful specimens of this ore occur on the Colorado desert, near the Colorado river, and in Lower California. It is sometimes mistaken for turquoise.

CINNABAR—Composition 86.2 per cent mercury, 13.8 per cent sulphur, weighing 549 pounds per cubic feet per ton. This is the principal ore of quick-silver, and has been reported from Riverside and San Diego counties, but I have seen no specimens in proof. The writer has five specimens from two distinct sources, alleged to have been found in Baja California. The industry in this county is practically confined to California, the product in 1896 being reported worth over one million dollars.

CUPRITE—Red oxide of copper; red copper; reported from the Colorado desert.

DENDRITE — "Footprints of the fern"; some beautiful specimens have been collected on the Mojave desert, by Mr. Ira J. Gray.

ERYTHRITE—Occurs at the Kelsey

mine, near Compton, Los Angeles county, Cal., associated with an ore of silver and of cobalt in dark colored earthy masses in a gangue of heavy spar. This occurrence was noted in 1881, and is described in the report of the state mineralogist for 1882, page 207, and in the fourth report, page 279.

There are two localities of erythrite in the west which deserve mention. One of these, near Lovelock's, Nevada, has yielded considerable quantities of nickel and cobalt ore. The cobalt bloom occurs in crusts and aggregations of very small crystals in the seams of a calcareous rock, containing also brilliant brass yellow acicular crystals of millerite. The ore as mined and shipped contains an unusually high percentage of both nickel and cobalt. There are also masses of a black earthy aggregate consisting largely of black oxide of cobalt. These masses do not appear to carry manganese oxide in any appreciable quantity and can not properly be referred to the ores of manganese, as with asbolite, but are rather entitled to a separate place as black oxide of cobalt, for which the name asbolite may be retained if the description is amended so as to make the presence of manganese unessential. —Wm. P. Blake, in Am. Jour. Sci.

FLUORITE—Colorado desert, in a massive form.

GALENA—Lead sulphide, composed of about 86.6 per cent lead, and 13.4 per cent sulphur, is one of the heaviest known ores, weighing 461 pounds per cubic foot, 4.34 cubic feet making a ton. It occurs in considerable abundance in some portions of the Colorado desert, carrying a greater or less quantity of gold and silver.

GILSONITE—A hydrocarbon, reported from Utah and Southern California. "A pound of this mineral dissolved in 5 pounds of turpentine gently heated makes an excellent japanning varnish, applied to metallic surfaces, and then baked, becomes quite hard. This varnish mixed with half a pint of oil,



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renders some fabrics waterproof and flexible when the varnish is perfectly dry.—Yates.

GRAPHITE—Plumbago or black lead is a carbon like the diamond, with some iron oxide and clay. A good quality of this mineral occurs near the Jacumba valley, in San Diego county, California, in some abundance, but remains undeveloped. It also occurs in other parts of the country, but not in sufficient quantities to be of any commercial importance.

GYPSUM—Sulphate of lime, when pulverized the plaster of paris, of commerce; when crystalized known as selenite; the finer granular variety is known as alabaster. Composed of about 32.5 per cent lime, 46.6 per cent sulphuric acid and 20.9 per cent water. Very abundant near Riverside, on the Colorado desert and Baja California.

HALITE—The salt fields of the Colorado desert, of San Quintin bay, and of Scammons Lagoon, Baja California, ensure San Diego an abundant supply aside from her own product, and promise to add considerably to our commerce.

HEMATITE—This iron ore occurs sparingly on the Colorado desert, in greater abundance on the Majave desert and in Baja California, where the writer obtained some fine specimens

of hematite in quartz in the Santo Tomas valley.

KALINITE—Alum occurs in considerable abundance in the sulphur mines of Baja California, especially in the region of the Cocopah mountains.

Review of the Cactaceæ

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KAOLINITE—The kaolin found at Cajon mountain, now being independently tested by the owners of the numerous claims, has attracted considerable attention, and so far seems to meet with favor. An analysis by H. Boedtker & Co., gave the following result: Silica, 62.30 per cent; alumina, 20.50 per cent; iron (trace) .00 per cent; lime, 2.20 per cent; magnesia, .25 per cent; water, 11.60 per cent; moisture, 3.10 per cent. Rational analysis: Clay substance, 67.2 per cent; feldspar, 15.6 per cent; quartz, 17.2 per cent.

LEPIDOLITE—Lithia mica occurs in an immense deposit near the old mission at Pala—probably the largest and richest lithia mine in the world—upon which about \$4,000 were expended in development work during 1899. Lithia of American production—the product of this mine—was for the first time placed upon the market, and thus a new American industry inaugurated at the close of the century.

“Mr. Chas. Russell Orcutt announced a new and remarkable occurrence of pink tourmaline in lepidolite, similar to that of Rumford, Maine, 12 miles south of Temecula, near San Luis Rey river, in San Diego county, the southern Co. of California, and it has already become celebrated from the abundance and beauty of the specimens yielded, as much as 20 tons having been sent East for sale. Through San Diego county runs the Peninsula range, rising several thousand feet between the coast and the Colorado desert. In these granite mountains are dioritic intrusions and some metamorphic schists, etc. West of the summit lies a parallel belt of granitic rock characterized by dykes of pegmatite, in one of the largest of which occurs this great deposit of lepidolite with tourmaline. In Pala a little west of Smith’s mountain, in the Peninsula range, San Diego county, California, a ledge of lepidolite containing rubellite has been traced for over half a mile. It consists of a coarse granite, penetrating a norite rock, and including masses of pegmatite. Small

garnets occur in the granite, and black tourmaline, with a little green tourmaline.

“The lepidolite appears in the southern portion, finally forming a definite vein which at one point is 20 yards wide. The rubellite is chiefly in clusters and radiations, several inches in diameter, also occasionally as single crystals, and the specimens of deep pink tourmaline in the pale lilac mica are remarkably elegant. About 18 tons were mined in 1892. No work has been done since.”—Kunz, 1893.

LEPIDOLITE DEPOSITS.—Mention was recently made in this column of the deposits of lepidolite (lithia mica) in San Diego county, Cal., and of their extent and value. The following further particulars of them have been obtained from N. S. Brown, who lately came up from them, and who is now in Los Angeles.

The properties are owned by N. G. Douglas, and are situated about 1½ miles from Pala, a short distance of Riverside county line. A New York firm of druggists took a bond on the mines one year ago about for \$160,000, paying ten thousand down. This bond expires on August 5 next, and it is not yet known whether the bond will be taken up or not. The New York firm has done a good deal of work on the mines, with a

view, it is believed, of determining the extent of the deposits. One tunnel which was run in 40 feet disclosed the fact that the ledge was 40 feet wide at a depth of 50 feet from the surface. The cost of mining it is practically nothing, for, as Mr. Brown says, you can pull down 500 tons of it with a single shot. Several shipments of it have been made to New York. The cost of hauling it from the mine to the railroad station at Temecula, Riverside county, is \$4 a ton, at which place Mr. Douglass was paid \$40 a ton for it, the New York parties paying the

freight on it from that point to N. Y. It is said that the only other known large deposits of lepidolite are in Austria and Germany, but the quality of these latter is considered less valuable than these in San Diego county. An analysis of some of the lepidolite from these Pala deposits showed that it contained about ten per cent. of lithia, and 60 to 70 per cent. potash, the lithia alone being worth \$700 per ton. Speaking of these mines the San Diego Union, in a late issue, says: "Superintendent Frank Belden, who has returned from a trip to Palomar mountain, reports that the lithia mines in that section are being worked day and night. A force of 25 men is employed in taking out the lithia rock deposits. Actual development of the properties has not yet fully commenced, the work now being carried on being to ascertain the extent of the deposits and the cost of marketing the same. A considerable quantity of the rock is being shipped to Germany, where it is used in the manufacture of lithia water."—Los Angeles Times, July

LEUCITE:

The history of leucite is very interesting. Some 30 years ago Humboldt made the general statement that leucite occurred nowhere outside of Europe. Curiously enough, until within a few years this statement held good. In 1874, however, Vogelsang found it in an Asiatic basalt, and in 1876 Zirkel announced its discovery in Wyoming.

Although the leucite was invisible to the naked eye, Zirkel's discovery was regarded as so important that the locality was named by the U. S. Geological Survey the Leucite hills. An interesting commentary on the influence of modern science is furnished by a name so given.

Another extra-European locality for leucite is now announced by Von Chrustschoff, who finds it in a lava in the vicinity of the extinct volcano Cerro

de las Virgenes in Baja California. The rock consists of an ash-gray ground mass sprinkled with rounded spots of brownish-black obsidian or glass, and with light specks of leucite. These light specks are shown by a lens to have a rounded octagonal outline.

The leucite is remarkably clear and fresh, and shows in polarized light the well known twining structure, even better marked than in leucite of the Vesuvian lavas or of the Laacher-See. While generally in rounded masses, the smaller individuals are often clearly octagonal in outline. The microscope shows the leucite to contain many inclusions, among which are augite, apatite, olivine, plagioclase, magnetite, nepheline, and glass inclusions and bubbles.—H. C. Lewis, reprint in *W. Am. Sci.* ii. 33.

LIGNITE—A vein 4 feet thick, 12 miles north of San Diego, was reported by Dr. Le Conte years ago, but seems to have been since lost sight of and remains undeveloped.

LIMESTONE—About 11.5 cubic feet weigh a ton, or 174 pounds to the cubic foot. See calcite.

LIMONITE—Elsinore, Cal.

MAGNETITE—Occurs eight or nine miles north of Mesquite station, on the Colorado desert. I have also found magnetic iron ore in the mountains north of Salton; in the Encantada mine near Alamo (rich in gold), in the Santo Tomas valley, and at San Ysidro, Baja California.

MALACHITE—Green carbonate of copper, composed of about 71.9 per cent copper oxide, 19.9 per cent carbonic acid and 8.2 per cent water, forms the most beautiful of copper ores, at times becoming a semi-precious stone. The finest specimens are probably found in the Ural mountains, but magnificent masses have been mined in Arizona, and it usually occurs in copper mines where azurite, chrysosolla or cuprite are present, in the Colorado and Mojave deserts, and in Baja California.

MICA—The mica of commerce is a form of muscovite, but no mine in San

Diego county has yet become a producer. See biotite, lepidolite, and muscovite.

MOLYBDENITE—Composed of 60 per cent molybdenum and 40 per cent of sulphur; a soft, black lustrous, foliated mineral, often mistaken for graphite. Occurs sparingly in granitic veins near the Jamul and Jacumba valleys and at Campo, in San Diego county, and in Baja California, but not yet known to occur in this region in paying quantity. The United States produced this mineral for the first time commercially in 1898—about 10 tons, worth \$50 per ton.

MUSCOVITE—Common throughout the granitic formations.

ORTHOCLASE—Feldspar is not rare near Ballena, and occurs at Julian and in Baja California in considerable quantity, and of a quality suitable for the manufacture of fine ware.

OBSIDIAN—Reported to occur in immense quantities near the head of the Gulf of Cortes, in Baja California. I have found small fragments in San Diego county, evidently brought from a distance by the Indians, who valued volcanic glass for the manufacture of arrow and spear points.

ONYX—Precious onyx (pure silica) is yet unknown in this region. Mexican onyx or Calcium marble, composed of about 56 per cent lime and 44 per cent carbonic acid, is found in abundance near the head of the Gulf of Cortes, and on one of the islands off the west coast of Baja California.

PECTOLITE—"A silicate of aluminum, calcium, and sodium." Has been reported as occurring in Southern California.

PLATINUM—This metal is found only in metallic condition, sometimes alloyed with iridium or osmium. A nugget weighing nearly two pounds (only 2½x3 inches in size) from Colombia, South America, has been reported as the largest in America, with an intrinsic value of \$350. It contained 85 per cent pure platinum and 15 per cent of gold, palladium and rhodium, and had a bluish-white lustre. This metal is almost as soft as copper and as ductile as gold. It can be rolled so thin that a thousand sheets in a pile would not exceed an inch in height. Our annual imports of this are valued

at nearly two million dollars, most of it coming from Russia, while a great deal goes to waste in California. A cubic foot weighs 1,344 pounds, worth \$240 a pound.

PLUMBAGO—See graphite.

PREHNITE—San Ysidro, Baja California, associated with calcite.

QUARTZ—A cubic foot weighs 162 pounds, 12.34 cubic feet making a ton. Occurs in an endless number of varieties. See agate, carnelian, chalcedony, jasper, etc.

Silicified wood occurs in various parts of San Diego county, but in the greatest abundance and variety on the Colorado desert; while Arizona is noted for its Chalcedony park, where an entire forest is preserved in a beautiful agatized form.

Diatomaceous earth occurs on the sea coast near San Diego.

RHODONITE—"Between San Diego and Colton."

RUTILE—This rare mineral was discovered by the writer at Mesa Grande in 1898, but not in any commercial quantity.

SALT—See halite.

SCHORL—Black tourmaline; quite common in San Diego county and in Baja California, disseminated through quartz or feldspar. Crystals six inches in diameter have been observed.

SULPHUR—Formed at the mud volcanoes on the Colorado desert. The water of various thermal springs in Southern and Baja California are strongly impregnated with this mineral. It occurs native also on the Colorado desert, and in widely separated localities in Baja California in volcanic regions.

TALC—A foliated variety occurs at Elsinore, Cal. See antonite.

WOLFRANITE—Southeast Arizona; reported from Baja California, but I believe erroneously. The finer quality is worth as high as \$700 per ton, and in consequence everyone should look out for it.

WULFENITE—Very fine crystals of molybdate of lead were obtained by the writer in 1888 from some of the mines north of Salton, in the Colorado desert.

CORUNDUM—Reported from Los Angeles county by Dana.

The following lines should be inserted on page 9 between the 9th and 10th line in the second column.

since been divided into two, but more, rather than less, territory is now tributary to San Diego, hence the present list will not be confined to the arbitrary limits of the county, but to the territory naturally tributary to our bay.

The past decade has been one of great activity in prospecting rather than of development, every ridge and peak probably having been scarred, with eager, but too often, uneducated eye. Fools have rushed in where angels fear to tread, with unsatisfying financial results, and just as often rushed over things that would have made independent fortunes had they but known their value.

The present trend of industrial progress will soon bring into demand many of our undeveloped minerals that could not be profitably utilized in the past. It is hoped that the following notes, while showing somewhat of our present known resources, may lead to the recognition of other crude material

The making of synonyms still goes on at a merry pace and thus the botanist is kept busy in recognizing old friends under new names. "Anything for a change" is a simple rule that seems to have been adopted by some botanists as their chief rule in botanical nomenclature. There seems to be more need of reduction of many names to synonymy than of so many new combinations.

Washingtonia.—When in Boston the writer improved the opportunity to look up some of the history of this generic name, and deems the following worthy of reproduction:—

Genus WASHINGTONIA Wendland.

"42. He unites the genus *Myrrhis*, Mx. with *Cherophyllum*; the *Ch. claytoni* of Persoon is however made a *Scandix* by Muhlenberg! which proves that it belongs to neither genera, but *Myrrhis* happens to be erroneous also, by being similar to *Amyris*, a previous genus, whence several names have been proposed for it, *Washingtonia*, *Osmorhiza*, *Gonatherus*; but these are not yet published; the second is perhaps the best."—"C. S. R[affin.]" in American monthly magazine, II. 176 (1818). A Review of "Pursh's Flora of North America."

Britton and Brown deemed the above a sufficient publication to justify discarding the

established name *Osmorhiza* later adopted by the writer of the above review—necessitating the coining of yet another name for our Californian genus of palms (*Neowashingtonia*).

Prof. C. S. Margent considered the prior suggestion in a newspaper (*Winsl. in California Farmer*, Sept. 1854) of the name *Washingtonia* for *Sequoia* as insufficient cause for the abandonment of its use. The action of Britton and Brown seems even less justifiable and would cause the present writer to hesitate about accepting any changes proposed by them until after careful investigation of the need.

Grasses of Baja California. The following species were collected by C. R. Orcutt near the 28th degree, and identified by C. E. Ball; the specimens were all presented to the division of agrostology, U. S. Department of Agriculture, for the National Herbarium.

The collection was made while crossing the peninsula from Santo Domingo (or Lagoon Head as some call it) to Santa Rosalia, on the Gulf. Thanks are due to J. H. Packard, H. L. Swain, Goodall, Perkins & Co., and others for favors received.

GRAMINEAE.

Genus ARISTIDA Linnaeus.

A. CALIFORNICA Thurber.

2556 Valle de las Tres Virgenes, near Santa Rosalia; one of the common forage grasses. Mar. 13, 1899.

2557 Near Calmalli, not rare, March 3.

2558 Santo Domingo, February 20.

2559 Near Mission Santa Gertrudis Mar. 10.

A. DISPERSA Trin.

2560 Data as above.

(To be continued.)

ANTIMONY—An ore carrying about 38 to 40 per cent of this metal, and from \$5 to \$30 per ton in gold, occurs near San Diego, and awaits development.

ZINC—Late discoveries in this county near San Vicente have recently been reported. Immense deposits are also reported to exist in the Mojave desert.

EPIDOTE—The United States produced \$250 worth of this semi-precious stone in 1895. Crystals in masses have been obtained by the writer near the

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GEOLOGY.

GEOLOGY OF SAN DIEGO COUNTY, CALIFORNIA.

By HAROLD W. FAIRBANKS, B. S.

Partly from its isolated position, and partly from the extreme ruggedness of much of its surface, San Diego county was totally neglected by the geological survey of California, under Prof. Whitney.

In the '50s the county was crossed by Prof. Blake, in connection with the Pacific railroad survey, but confining himself to a single section from San Diego through Warner's ranch, San Felipe valley and the desert, he gained only a faint conception of the structure of the county.

W. A. Goodyear, in connection with the Mining Bureau, and one or two others, have been over the county somewhat, but their notes contain very little geological information. Many fossil shells have been described from the coast, but no stratigraphical notes have been made. The reports of these men, together with some notes on the geology of the desert by C. R. Orcutt, are, I believe, all that has been written concerning the geology of county. Hence it may be seen that

the region from a geological point of view was almost a *terra incognita* when the writer began his work last fall, and the many interesting discoveries made bear out this statement.

The physical features of the county have been too well described by T. S. Van Dyck and others to need any elucidation, suffice it to say that there are 3 great divisions: the desert on the east, the peninsula range of crystalline rocks in the middle, and the level mesas in the west. The greatest interests, both geologically and economically, is connected with the crystalline rocks. This chain of rugged mountains, extending north and south through the county, is far from being a uniform granite, the granite proper (forming a proportionately small part), tho considered by some to be metamorphic, is undoubtedly of an eruptive nature. It is usually coarse and easily decomposed, so that only in places is it fit for building purposes.

GOLD BEARING ROCK.

Gold and other metaliferous deposits do not often occur in the granite, but in the long, narrow arms of gneiss and mica schist which as a usual thing, run parallel to the range, and though usually appearing

in bodies of small extent they present a great development near the summit. From their southern limit on the Laguna mountains, they pass northward through Julian, Banner, the Santa Ysabel ranch, and lie along the western slope of Smith's mountain. As the Temecula canon is approached they are cut off by granite. North of the canon and on the Santa Rosa ranch their development is again very great, and prospects of gold, silver, and copper, have been found in them at the latter place.

It is impossible to say how much of the desert region northeast of Julian belongs to this same metamorphic series, but from the reports of prospectors I should say the amount is large. At the time of the origin of the range, the metamorphism was so great and the erosion so complete that not only are all traces of fossils lost, but the schists themselves have been nearly obliterated. We know that the range must be pre-cretaceous from the occurrences of but slightly disturbed strata of that age in two places on the coast, and it is likely, judging from the presence of crystalline limestone that it belongs to some division of the paleozoic, though I see no reason for attributing to it an age as great as archæan.

The range resembles the Sierras in its bold Eastern escarpment, which, I believe, in San Diego Co. represents a sharp fold rather than a fault. The finest view which I have obtained of these features was from the eastern edge of the Laguna mountains where the descent is nearly precipitous from an altitude of 6400 feet to the desert below.

Glassy diosite is another body of rock forming a considerable portion of the range. It is usually taken for granite. Several varieties of dark

eruptive rock known as norite, gabbro and diabase, constitute many of the most prominent peaks, among which are the Cuyamaca, Nejas and many lesser ones near Dehesa and Bernardo.

West of the granite and partly covered by the mesa is a very peculiar volcanic breccia or tuff which blends at times into beautiful black, gray or reddish porphyries. The formation is older than the granite. It extends from a point a little west of San Marcos southeasterly to the boundary line, where it has a width of 7 or 8 miles. The conspicuous peaks, Black mountain, San Miguel, and Otay, are formed of this rock. To the presence of this dark basic rock is due a large proportion of the rich, heavy soil of the mesa.

ANCIENT RIVER CHANNEL.

One of the most interesting discoveries made was that of the existence of an ancient river channel at a point south of the road from Ramona to Ballena. Only by the existence of such a channel can we account for the immense amount of gravel and boulder deposit around the bay of San Diego. In a conglomerate at the southern extremity of Point Loma are boulders, many of them 10 feet in diameter, which resemble exactly the volcanic tuff on the eastern edge of the mesa, 12 miles distant. In no other way than by means of a large and swift stream, existing at a time when the configuration of the country was far different from what it is now, can we account for the transportation of so large boulders such a long distance. Glacier action is out of the question. This ancient river channel is oriferous and the gravel also contains garnets, not known to occur in any other place short of the desert [this is an error.—Editor]. Another very

interesting fact, and one which seems to have escaped the notice of all previous investigators, is the existence, on the Santa Rosa ranch of a basaltic lava flow. This lava flow forms a series of flat-topped hills, beginning near Murrietta, at an altitude of 1800 feet, and extending westward, with bold cliffs to the south, a distance of ten miles, reaching an elevation of 2500 feet on Mesa Redondo. On the chapparal hills west of Murrietta there is the neck of an ancient crater represented only by a volcanic conglomerate. Another crater existed on the south side of Mesa Redondo, and from this a narrow stream of lava descended a distance of 2000 feet in the course of a mile and a half, terminating in De Luz valley. From the center of the valley the winding course of the lava presents a picturesque appearance, being distinguished from the neighboring brushy hills by a growth of oak trees, and hence called Oak Ridge by the people of the valley.

Under the high, level table lands of lava is a layer of soft sandstone. No other outcrop of sandstone appears in the vicinity, except in one or two nooks in the Santa Margarita mountains, at an altitude of 2600 ft. The great strain produced in the uplift of this chain of mountains, occurring after the miocene was the cause, doubtless, of the outburst.

THE MESA FORMATION.

When we come to the study of the mesa formation a difficulty arises as to the stratigraphical relations of the various members of the tertiary which are represented by a great variety of fossil shells. There also arises the difficulty in drawing a line between the cretaceous rocks of Pt. Loma and La Jolla and the tertiary. It is possible that in these forma-

tions workable beds of coal may be found, but the probabilities are against it. The position of the strata also militates against the probability of finding artesian water.

When we try to trace the fluctuations of the height of the land during the tertiary and the quaternary times we become almost confused. Some of these changes of level have been accompanied by violent disturbances, as exemplified in the faults and crushings on the seaward face of Point Loma, and in the frequent folding of the strata: False bay occupying a synclinal basin; Pt. Loma and La Jolla lying at the summit of an anticlinal.

During the latter part of the tertiary this region was raised from one to two thousand feet, and the shore line then lay 50 or 60 miles to the westward. It was bordered by a range of mountains, whose tops are now represented by the scattered islands from Santa Barbara south. At the beginning of the modern period there was a great subsidence, and the open ocean washed the base of the granite mountains, eroding them to form the great stretches of mesa. This was followed by a gradual elevation, represented by the numerous terraces or beach lines. The last elevation, about 40 ft., has taken place so recently that the shells in the old beach line are still living in the adjoining ocean.

Such are some of the main points in the geology of San Diego county, which it is hoped will be more fully worked out in the future.

The county, from its great geological interest, certainly deserves more attention than it has yet received.—San Diego Sun, Apr. 16th, 1891.

CATALOG OF MINERALS, ROCKS
AND ORES IN THE ORCUTT
COLLECTIONS.

The first number is the catalog number, followed by the name, locality, donor or collector, number of specimens and cost (if obtained from a dealer). In cases where two or more specimens are noted we will exchange, or sell.

- | | |
|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1 Drusy quartz on native sandrock, Herkimer county, N. Y. 1 (cost) \$1 | 24 Ditto. 1 \$1 |
| 2 Quartz crystal, same locality, 1 \$2 | 25 Ditto. 1 \$1 |
| 3 Gold ore, Owen's mine, Julian, Cal. Received from S. N. Wilcox. 1 | 26 Ditto. 1 \$1½ |
| 4 Garnets, picked up by Indians at Ft. Defiance, New Mexico, in 1870. From Mrs. Annie E. Case, Ap. 1, 1889. 595 specimens. | 27 Ditto. 9 \$6 |
| 5 Peridot, same locality. 4 | 28 Ditto. 12 \$12 |
| 6 Rock crystal, same locality. 11 | 29 Ditto. 2 \$2 |
| 7 Pyroxine variety, same locality. 6 | 30 Zoisite, Pomfret, Vt., 1877. 1 |
| 8 Limestone, Washington county Ind. From Miss Adelaide Reid. 3 | 31 Flint, Chalk Cliffs, England. 1 50c. |
| 9 Opals, Queretero, Mexico. 2 \$1 | 32 Porphyry, near San Rafael, Baja Cal. 1 |
| 10 Iron nodules, abundant on the surface of the ground on the mesa at Del Mar, Cal., back of the town. 11 | 33 Selenite, N. S.; F. M. Goodwin. 1 |
| 11 Gold ore, Calmalli, Baja Cal. 2 | 34 Gold and silver ore, Calico, Cal. 1 C. C. Kent. |
| 12 Quartz ("gold and silver ore), Pacific mining district, Colorado desert. 12 | 35 Same, with molybdenite, Jacumba valley, Cal. "\$28 in silver." 1 |
| 13 Gold and silver ores, same district, Golden Rule mine. 20 | 36 Cassiterite, Temescal, Riverside county Cal., 10 mi. from Elsinore. 1 |
| 14 Precious opal, Queretaro, Mexico. 4 \$2 65 | 37 Tourmaline, Cantillas canon. Baja Cal. H. C. Orcutt. 1 |
| 15 Agate. 1 \$1 | 38 Geodes (fragments), Washington county Ind. Miss A. Reid. 8 |
| 16 Agate, Brazil. 1 75c. | 39 Amethyst, Thunder bay, Mich. R. P. Chandler, 2 \$2 |
| 17 Agate, Brazil. 1 \$1 | 40 Azurite, Laurian, Greece. 1 \$5 |
| 18 Amazon stone, Pikes Peak, Col. 1 \$1 | 41 Millerite, Antwerp, N. Y. 1 \$2 |
| 19 Obsidian, Mexico. H.N.Rust. 1 \$1½ | 42 Byssolite, French Creek Falls, Pa. 1 \$1 |
| 20 Quartz crystals in matrix of sandstone, Herkimer county, N.Y. 1 \$1 | 43 Gold ore, Sunnyside mine. 1 \$3 |
| 21 Quartz crystal, same locality 1 \$2 | 44 Ditto. 68 specimens |
| 22 Ditto. 1 \$1 75 | 45 Ditto. W. F. Hendsch. 1 |
| 23 Ditto. 1 \$3 | 46 Ditto, Red Cloud mine. 20 |
| | 47 Dendrite, same mine. 9 |
| | 48 Clay concretions, Colorado Desert, June 1888. 25 |
| | 49 Cyanite, Hartland Vt. H.C.Orcutt. 1 |
| | 50 Marble, Colton Cal. H.C.Orcutt. 2 |
| | 51 Gold ore, Descanso mine, Julian Cal. \$210 per ton. 1 |
| | 52 Silver ore, Garfield mine, Calico. Cal. I. J. Gray. 1 |
| | 53 Cuprite, from Benton Holcomb. 1 |
| | 54 Copper ore, Grauby, Conn., from Benton Holcomb. 1 |
| | 55 Feldspar, silver mine, Hartland Vt. 1 |

- 56 Borax crystals, from 18 miles of Barstow Cal. C. C. Kent. 3
 57 Pumice, Salton, Cal. 2
 58 Garnets in slate, Vt. H. N. Rust. 1
 59 Rose quartz, Black Hills. 1
 60 Chlorophane, " " 1
 61 Copper ore, Elsinore Cal. John D. Hoff. 1
 62 Marble, San Jacinto, Cal. 1
 63 Spar, Mo. H. N. Rust. 1
 64 Gold ore, Gypsy mine, Julian Cal. 1
 65 Same, Valentine mine, " 6
 64 and 65 from S. N. Wilcox.
 66 Gold ore, Julian Cal. S. N. Wilcox. 3
 67 Carnelian, Japa. Baja Cal. H. C. Orcutt, Sept. 1884. 2
 68 Dog-tooth spar, clustered on the roof of a cave on the east side of the Chiricahua mountains, Arizona; F. Stephens. 2
 69 Golden mica, from H. N. Rust. 2
 70 Selenite crystals, Ellsworth, Ohio. 2
 From R. P. Manning.
 71 Selenite, Nova Scotia. 2

(To be continued.)

GEMS AND PRECIOUS STONES.

ACHROITE (colorless tourmaline)—Of gem quality, has been discovered in San Diego county, California, associated with other lithia tourmalines.

AMBER—See succinite.

AGATE—Occurs in various forms in Southern California, but not in commercial quantity. The world's supply is principally received from Uruguay and Brazil, which are mainly cut and polished in Germany.

ALMANDITE—Red garnets are not rare in the California placer mines. Some few crystals of gem value have been produced in San Bernardino county; the finest having been valued as high as \$50 apiece. In the placer mines in Lower California the garnets were formerly saved, and sold for \$5 per pound—being popularly called rubies—like the garnets of Arizona and New Mexico, which are said to be much superior to the "Cape Rubies" by artificial light.

AMAZONSTONE—A beautiful semi-precious stone of the feldspar group; the finest specimens of which come from Pike's Peak, Colorado. Has been reported from Baja California, but I have seen no specimens in proof.

AMETHYST—Deep purple, bluish violet fading almost into pink, crystalline variety of quartz. Colorado yields many fine specimens. May be expected to occur in some of the mines of the Colorado desert.

BERYLS—Quite equal to those from the Ural mountains have been produced in Maine and North Carolina. Their occurrence in San Diego county has recently been predicted.

BRAZILIAN EMERALD—The emblem of the Brazilian clergy, is not an emerald proper, but a green colored tourmaline. A few green tourmalines have been found in San Diego county, in the lithia mine at Pala, and in several other localities, some of them of the finest gem quality. One beautiful specimen showing a perfectly flat termination, is banded green at the end, then a band of achroite shading into rubellite where fractured. Another specimen is green at the center, with a thin outer crust of black.

CARUELIAN—A variety of quartz, translucent like horn, yellow, brown or red. Has been found on the Colorado desert, and specimens collected in the Japa valley, Baja California, are in the writer's cabinet.

CASSITERITE—Tin stone from Cornwall, England, is composed of 78.6 per cent tin, and 21.4 per cent oxygen. It occurs in the Black Hills, South Dakota, at Temescal, Riverside county, California, and near San Diego. The two latter localities may yield specimens equal to that from Durango, Mexico, which is polished as a gem.

CHALCEDONY—An uncrystallized translucent or clouded variety of quartz, white, yellow, brown or blue (usually whitish), having a luster nearly like wax. When arranged in stripes or layers of different colors it constitutes agate; and if the stripes are all horizontal, it is called onyx. Chrysoprase is a green variety; caruelein a flesh-red; sard a grayish red. Portions of the Colorado desert in San Diego county are strewn with water-worn fragments of chalcedony of differ-

ent colors, across of the mesa-like formation, near the boundary line between the United States and Mexico, being covered with pebbles of every conceivable color and as smoothly laid as a piece of mosaic work.

CHRYSOPTASE—The locality near Visalia, Cal., yielded to the value of \$400 in 1896, more than half of it for cutting, the rest for specimens. Chrysoptase is a translucent, pale bluish-green or yellow-green chalcidony.

CYANITE—Large quantities of small crystals occur in the Cargo Muchacha district, on the Colorado desert. None of gem value have been yet discovered.

DIAMOND—A small stone was reported in 1898 as having been found in Baja California, about 50 miles south of Ensenada. Diamonds have not been found in such numbers and size in California as to render the search for them profitable, but no serious prospecting for them has yet been attempted. Itacolumnite or flexible sandstone, an alleged native of the diamond has been reported from San Diego county.

EPIDOTE—The United States produced \$250 worth of this semi-precious stone in 1895. Crystals in masses have been obtained by the writer near the Alamo, and associated with crystals of calcite from near the coast south of Santa Tomas, Baja California.

GARNET—See Almandite.

HYALITE, or Muller's glass—A variety of opal, is described by T. Beck as occurring in Beaver valley, Utah. A fine quality of this stone occurs near San Diego.

INDICOLITE—Blue tourmalines are reported as occurring in San Diego county.

ITACOLUMNITE—Flexible sandstone has been reported from the Jacumba valley, but has not been seen by the writer.

JASPER—Baja California.

JET—A fine black jet, evidently in some quantity, is reported from the vicinity of Santa Fe, New Mexico.

OPAL—Occurs on the Colorado desert, and also credited to the limits of the city of San Diego, but only the in-

ferior varieties are yet known in California. Banded opal has been described as occurring in Beaver valley, Utah, some three miles from Granite Peak. See hyalite.

PERIDOT—New Mexico.

QUARTZ—Fine crystals have been found in the lithia-mine at Pala, from which some beautiful stones have been cut.

A beautiful fragment was found on the Maneadero, south of Ensenada.

Rose quartz in magnificent masses has been found by the writer near Mesa Grande.

RUBELLITE—Beautiful radiations and masses of crystals of pink tourmaline occur in the lepidolite at Pala. A few crystals of gem quality, resembling those from the Isle of Elbe have been found in the county. The largest crystals measure two inches in diameter.

An interesting black tourmaline, beautifully banded with pink rubellite, was found in 1898, at Pala. Fine specimens of gem quality have been found at this locality, now famous with collectors.

RUBY:

The so-called rubies of the placers of Baja California are not true rubies but only garnets, and seldom of value as gems.

True rubies occur in N. C. and S. C.

SAPPHIRE:

Dr. J. Lawrence Smith published the first description of the occurrence of sapphires in Montana, in the American Jour. Sci. III. vi. 185, Sept 1873.

SCHORL—Black tourmalines, six inches in diameter, were found at Mesa Grande.

SILICIFIED WOOD:

Quantities of this occur on the Colorado Desert, where agate and chalcidony pebbles abound.

SUCCINITE—"Amber in small modules was found near Pendennis, Lane county, Texas, by L. W. Hastings. The

color is a rich brown, resembling burmite." Should be looked for on our coast.

Amber, so extensively employed as mouth-pieces for meerschaum pipes and segar holders, is believed to be a fossilized vegetable gum or rosin. Anciently a fabulous origin was attributed to it. As it was found on the sea shore after a storm, it was said to be solidified tears of the sisters of Phaeton, or of sea-nymphs. It is of a yellowish color, frequently streaked with milky white, the yellow color being semi-transparent. Those specimens which have a clouded milky appearance are the most highly valued, as the clear yellow can be imitated by recent and cheaper gums. It is singularly electrical, when rubbed, developing negative electricity to such a degree in manufacturing it into forms in which it is sold the workmen are sometimes affected with nervous tremors, and they are obliged frequently to change the pieces they handle. It is found on the Baltic coast of Prussia, either washed ashore after a gale, or entangled in masses of seaweed. Mines of it are also wrought in Prussia. It is found in this country at Amboy, N. J.; at Gay Head, Marthy's Vineyard, and at Cape Sable, in Maryland. Leaves of fossil plants and tropical insects are sometimes found imbedded in it, a fact that has given rise to some pretty poetical conceits. In the East it is highly valued, and has been used as a form of concentrated wealth, as are diamonds and other precious stones. When heated it exhales an agreeable odor, and for this, among other reasons, it is in great request as mouth-pieces for pipes—Selected.

TOPAZ—The specimens alleged to have been found at Santa Monica, Cal., were undoubtedly frauds.

TOURMALINE—See achrolite, Brazilian emerald, indicolite, rubellite and schorl.

A blue chalcedony is reported from a mine near Julian, as occurring in a thin vein at a depth of about one hundred feet. It may prove of some value as a gem, and specimens or further information are greatly desired by the writer.

TURQUOISE — Reported from the Colorado desert, but no specimens have as yet been seen by the writer. Certain copper ores are easily mistaken for this stone. Mines of this gem of great extent are being worked in the Mojave desert region northwest of Vanderbilt.

This beautiful stone has been more or less regularly mined in New Mexico for years; other localities have been found more recently in Texas, Arizona, Colorado, Nevada, and in California.

WARDITE:

A mineral that may possess some interest as a semi-precious stone, from Utah.

Many other gems and precious stones are likely to be detected in this region as rapidly as attention is directed to the subject.

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(Continued from page 18.)

Genus ARISTIDA Linnaeus.

A. DISPERSA Trin.

- 2561 Data as above, large fls., twisted awns.
- 2562 Same locality, March 11.
- 2563 Near Calmall, Feb. 24.
- 2564 Same locality, Mar. 5.
- 2565 Near Vulcan de las Tres Virgenes, Mar. 13.

Genus BOUTELOUA Lagasca.

B. ARISTIDOIDES Thurb.

- 2566 Near Calmall, not rare on dry plains. March 4.
- 2567 Near Mission Santa Gertrudis, Mar. 10.

Genus MUHLENBERGIA Trin.

M. DEBI-IS Trin.

- 2568 Data as above.
- 2569 Same vicinity, Mr. 1.
- 2570 Near Calmall, Mr. 1.
- 2571 Valle de las Tres Virgenes, Mr. 14.

Genus FESTUCA Linnaeus.

F. OUFLOFLORA Walt. var.

- 2572 Near Mission Santa Gertrudis, Mr. 10.
- CENCHOAUS PALMERI Vasey.
- 2573 Near Calmall, F. 24, not rare.
- PAPPAPHO-UM WRIGHTII Watson
- 2574 Near Calmall, common on rocky slope, Mr. 3.
- EKAGROSTIS MAJOR Host.
- 2575 Valle de las Tres Virgenes, Mr. 14.
- TRIODIA PULCHELLA HBK.
- 2576 Near Eureka mine, Calmall, Mr. 1.

CYPERACEÆ.

The Cyperaceæ were determined by Mr. Pollard, of the National Herbarium.

Genus ELEOCHARIS R. Brown

E. ABENICOLA Torrey.

- 2577 Vulcan de las Tres Virgenes Mr. 13.

Genus CYPERUS Linnaeus.

C. VIRENS Michx.

- 2578 Near Calmall, Mr. 10.

Established 1884.

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Mar., 1900.

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THE DESERT.

Read March 8th, 1900, before the San Diego Society of Natural History

(By courtesy San Diego Union.)

Sand is one of the chief constituents of the desert; when a desert is devoid of sand it may be termed rocky (no slang intended). Water is one of the chief elements composing the earth, but on the desert it is chiefly conspicuous from its absence. The lack of moisture accounts in a measure for the dearth of vegetation usually attributed to a desert. Absence of vegetation formerly meant lack of inhabitants—deserted, hence the name desert, and the usual definition thereof: "An uninhabited region, destitute of moisture and vegetation."

The desert in Nevada was the first experienced in nature by the writer. My recollection pictures a dreary plain, vast in extent, arid in aspect, composed of ashes, sand and lava. Specimens of the lava, some white, some black, some red, are still in my cabinet. Water, strongly impregnated with alkali and clay, and a few desolate looking station houses, are also remembrances of the region.

My next experience with a desert was in California, some years later, when I explored a portion of the Mohave desert. It was in May 1882, and abundant rains had changed the desert into a garden of loveliness. The sandy slopes from the Cajon Pass to the Mahave river were covered with a carpet of tender annuals decked with flowers of many brilliant colors. Like the rest of California, the different flowers were in separate beds, as if sown

by some experienced gardener who disliked mixing up the varieties. Here would be a strip of some flower in white; adjoining it, perhaps a zone occupied by a delicate blue Gilla, and then a lemon colored Gilla, and next a bed of brilliant orange.

The forest-like growth of *Yucca arborescens* (or "Yucca-Palm" as it is frequently called—though not a palm but a member of the lily family), was not in keeping with the dictionary, no more than the corner lot stakes and the irrigation ditches and the brick buildings, which, later in boom times, invaded the solitude of the coyote and the rattlesnake.

Dr. Asa Gray once said that he had great difficulty in making plants conform to their descriptions, and the dictionary maker no doubt experiences frequent difficulty of the same character. A desert is still a desert—though covered knee-deep with water, as was a large portion of the Colorado desert in 1891; it is still a desert though covered with a dense jungle of impenetrable vegetation, as are portions of the New River country; it is still a desert though occupied by thousands of human beings—as may be verified by a visit to sundry mining camps of the present day.

It is not my intention at present to dwell upon the wonders and beauties of the Colorado desert, which has been my camping ground for months at a time, but to give a hasty narrative of a trip taken a year ago across Baja California, from the Pacific to the gulf.

My route lay near the 28th degree, the steamer *St. Denis* landing me nearly opposite Cedros Island at a place called Santo Domingo, but more properly, and I believe better known as Lagoon

Head, a few miles north of Scammon's Lagoon, and a part of what forms the great bay of San Sebastian Viscanoa.

In the general aspect of the region and in the character of its vegetation, the country bordering the Pacific at this point eastward to the gulf shores, may be considered as typical of a desert, differing but little from portions of the Colorado desert, though some hundreds of miles farther to the south.

Ocean fogs render the region capable of supporting a rich lichen flora (almost totally absent from the Colorado desert), the scanty shrubs and abundant rocks being heavily laden with a great variety of this class of plants, including the *Roccella tinctoria*—so noted as a dye material, which I believe has Point Loma, near San Diego, as its most northern limit of natural growth.

The datile or "wild date" (*Yucca valida*), first seen at or near the Rosario mission, south of San Quintin bay, forms the most prominent of the characteristic shrubs of the region, and furnishes in its light porous trunks a goodly portion of the fuel used in the mines at Calmali.

The fruit is sweet and edible, I believe, like that of *Yucca mojavenensis*, but the plant more closely resembles the *Yucca arborescens*, so famous as a denizen of the Mohave desert, the short leaves, the panicles of lovely waxy white flowers, and the strong fibre of the trunks, being the strong points of resemblance.

A few days spent on the shores of the lagoon and of the ocean at Lagoon Head, revealed little in the molluscan fauna different from that yielded by San Diego bay. The scallop (*Pecten aequisulcatus*) and the hard shell clam (*Venus similima* and other species) were in the greatest abundance, as they were twenty years ago in San Diego bay, before the gatherers for the San Diego market had so nearly exterminated these species in this vicinity. Large areas of the sandy shores of the lagoon were so thickly strewn with the snapping shells of the scallops—each in a miniature lagoon of its own—as to render it impossible to walk without treading upon this luscious mollusk.

Dosinia ponderosa, which once lived in great numbers along our San Diego shores when Coronado was beneath the ocean wave, was found living in this lagoon, and to be counted among the edible species of clams of this region, as also *Laevicardium elatum*, now practically extinct in San Diego bay, and a heavy species of *Arca*, which I have not seen either living or fossil at San Diego. The beautiful pure white *Amiantis callosa*, so abundant at times at Ensenada, and occurring as far north as San Pedro or Redondo, was one of the most abundant among the shells cast up by the waves on the ocean beach. For the last twenty years this has been considered a rare shell at San Diego, but though not seen alive it must be counted as one of the commoner shells at Lagoon Heads, and classed among the edible mollusks.

Hundreds of the delicate lamp shells (*Anomia lampe*) were collected, attached to each other, or to other shells, bits of wreckage, etc. A little boat was anchored in the lagoon with a band of pearl fishers, who had found a bank of the lovely *Nacre* shell off the ocean beach, and who had reaped quite a harvest of the pearls of the ocean. The divers had also brought up a few shells of *Cypraea spadacea*, showy orange-yellow sea-fans, some strange star fish, and other objects of interest, and before I left the region they secured a big haul of some large fish—one of which added to my own meagre bill of fare.

On the shore I found several colonies of the minute *Pedipes unisulcata*, and occasionally, clambering over the lichen-festooned *Euphorbias*, after a heavy fog was seen the dark-skinned *Epiphragmophora laevis*, carrying its pale banded shell—scarcely distinguishable from the drifting sands. We used to call *Epiphragmophora* a plain *Helix*, but a generation of young scientists, finding nothing else to do perhaps in this small world, have seen fit to give us new names for the most of our plants and shells—and, not finding new names for old *Caesar* and *Cicero*, must devise a new pronunciation to fit the needs of these sad cases.

They say an American, when he travels abroad, devotes a great portion of his after descriptions of his experi-

ences to recounting a history of hotel accommodations enjoyed. To prove my right to American citizenship, I must therefore not omit to mention the bill of fare employed during my stay at this seaside resort. Here it is:

BREAKFAST:

Coffee (black, without sugar). Tortillas. Clams.

DINNER:

Ditto.

SUPPER:

Ditto.

Stewed fish formed a diversion for one or two days while I was waiting for the wagons to take me to Calmalli.

The road to that tented city was mostly a level, sandy plain, gradually rising from the beach to the foothills, the camp being situated among low hills some fifty miles from the landing. On entering the hills the vegetation increases in variety and interest, the giant cardon cactus (*Cereus Pringlei*) being met with in great abundance, the finest specimens being about forty feet high and two feet in diameter, the summit of the older stems being devoid of spines. The young plants of this giant cactus are slenderer than in the Arizona giant (*Cereus giganteus*), but the two seen growing together, as they may be found near Guaymas, in Sonora, are scarcely distinguishable at a distance.

The most remarkable and curious plant in all Mexico is probably found here also, growing with *Cereus Pringlei*, and known to the natives as the *clrio*. It was first described by Dr. Kellogg under the name of *Idria columnaria*, but was later recognized as a species of *Fouquieria*, and so appears in later works as *F. columnaria*. In the spring of 1886 I first found this strange tree growing near the Rosario mission, and described it in the West American Scientist as *Fouquieria gigantea*, in June, 1886, but Dr. Kellogg's name has priority. One of these growing near the San Juan mine, in Baja California, was said to have measured ninety-two feet in height. The usual height is from thirty to, say, fifty feet, I should judge, and is aptly described as resembling a huge inverted carrot, the thick fleshy trunk being perhaps two feet in diameter, usually without branches, but the top often bifurcated, and some-

times the top curves over like the trunk of an elephant—hence some people have called this the elephant tree. But it must not be confused with another plant found here, also called the elephant tree, mentioned by Veatch and others in reports upon their travels. Slender twigs several inches to a foot long cover the sides of the trunk from base to top, and on these twigs are borne the leaves and flowers in their season—and at all times they are well armed with thorns, which are formed out of the persistent petioles of the otherwise short-lived deciduous leaves.

The chollas and prickly pears, the bisnagres, the garambulo (*Cereus Sargentianus*), and several species of the *Mammillaria*, the *pittalla dulce* (*Cereus Thurberi*), the recently new *Cereus Brandegei*, etc., render the camp of Calmalli notably rich in its cactus flora. The chollas are rendered useful for fuel, the *pittalla dulce* for its delicious fruit, as well as the yet more luscious *pittalla agria* (*Cereus gummosus*) also abundant here, and the barrel cactus (*Echino-cactus peninsulæ*), is utilized in confections. The carden alone seemed to be useless among the members of the cactus family.

The mesquit was present—apparently an indispensable feature in the desert floras of both North and South America, along with the creosote bush (*Larrea Mexicana*), the *Artemisia*, and other plants that extend northward into the Rocky mountains. Many arborescent species of the *Leguminosae* were likewise present, and many of these were adorned with an abundance of air plants, which I found useful in packing up my collections of living cacti that I shipped home.

Podilanthus macrocarpus was one of the most curious plants observed, with slender, nearly leafless white stems, surmounted with dull red flowers of peculiar form, and noted for its poisonous milky juice. The natives called it the *candelaria*. *Viscainoa genculata* was another shrubby plant observed abundantly from Calmalli to the gulf shores.

But however rich the mines or great the variety of cacti, the time came round for me to continue my trip across the peninsula to the gulf. Trinidad Arias, I believe, was the name of the

dusky native whom I engaged for my servant and guide, on this, to me, ever memorable trip. The correct spelling of his name I cannot vouch for—neither, probably, can be. He wore a hat and a pair of shoes, also a shirt of approximately his own color, and a pair of blue overalls. A cirio tree—perhaps by chance—formed a corner post for his humble home; its tall, slender trunk, with countless branchlets, making his domicile plainly visible at a considerable distance. The rest of his house was largely composed of Yucca logs for sides and roof, fastened in place in part by baling wire, bits of rawhide, and broken-up boxes nailed on in places. A few rawhides and flattened out tin cans, and now and then a little brush, completed the material used in the construction of the primitive dwelling. Over all hung bright red and once-white bits of cloth, spread to dry in the sun, but adding variety to the coloring of the desert landscape.

A gentle burro stood tied to a post, on the morning of our departure from Calmalli, while a young calf on the opposite side awaited the return of a meek-eyed but long-horned red cow that supplied a part of the family living. A couple of raw hide sacks for packing the burro, decorated the walls of the house, together with a saddle, bits of rope and various utensils of diverse character. An old oil can stood outside on some stones, in which the family soup was no doubt boiling. Inside, was a rude bench, also a table, an empty box, and a sewing machine, and simple accommodations for sleeping. A comfortable looking old hen, a lean dog, and a grunting pig had equal entrance or exit with the sleek cat, a shrewd looking boy with one leg, and a black-eyed and black haired girl dressed in a faded whitish dress and red ribbons. A baby rather smaller than the cat, another boy and the mother of the children completed the family group, which we left around the table discussing their daily menu.

The trail from Calmalli was nearly due eastward, and the first night was spent amid the ruins of the mission Santa Gertrudis. Dates and figs still survive from the ancient planting, and I saw that our kegs and canteens were

filled with the delicious mountain water, that we there left behind us. The trail then became rougher and rocky, ever with an upward tendency. New varieties of cacti and other plants strange to me made their appearance among the clefts of the rocks. At noon the second day our light repast of tortillas and cheese was taken at the summit, where the abrupt peninsula mountains presented the steep descent to the sea noted for its fisheries of pearls.

The descent was slow and long, winding about the steep, precipitous canyon slopes, where the better part of prudence caused me to relieve the friendly mule of his burden. Just as the sun went down we reached the bottom of a sandy arroyo, leading to the gulf, where we cooked a little jerky, and drank from a little rocky pool which a stranger might have searched for in vain, but where my guide said there was siempre agua (always water).

The next day was a slow tramp over sandy arroyos and clayey hills until we reached the shores of the great gulf at Trinidad. A hasty half hour of rich collecting of shells along a rocky beach was here enjoyed; but prudential considerations cut our stay short, and a dry camp was made at the close of day near where we again left the beach. Many interesting observations could be made concerning the geology, the history and other aspects of this desolate region. The sandstone for miles and miles was seamed with cracks and laid out in little squares—no doubt the result of former earthquake action. Volcanic action was everywhere in evidence. High up on the mountain sides I found beds of sandstone and shells—lifted a thousand feet above the present waters of the gulf. Before we left the shores of the gulf we passed heaps of nacre and other shells—formed a century ago by the Indians—employed by the Spanish in fishing for pearls. What stories these stones could tell if they were imbued with the power to talk.

Another night was spent at La Palma, where springs of water form an oasis in the desert, and beautiful palms and wide-spreading wild fig trees (*Ficus Palmeri*) spread their foliage to an

erstwhile not gentle zephyr. At night here my guide examined well his long sharp knife and cautioned me to lay mine by my side too, saying mountain lions might visit the water in the night. His laconic warning did not prevent sleep on my part, and no sign of any wild beast was met with on the trip, excepting a solitary fox, climbing a steep hillside.

I attempted dabbling in mines a little on my way, with the usual result that follows such rashness, that I burnt my fingers a bit. But the experience was worth the cost, and the "three virgens" were not severe in their chastisement, when I put my fingers too near the glow-holes of this now nearly extinct volcano. Beautiful crystals of pure yellow sulphur are formed around these air-holes, and when removed incautiously I found it literally too hot for me. Some interesting minerals may here be observed but my transit was altogether too hurried to permit of satisfactory investigations, and I did not knowingly find the leucite reported from this vicinity, about which I published a brief account in one issue of the West American Scientist.

Leaving the volcano and its hot and cold springs behind, the trail led over rough, precipitous mountain slopes and canyons or barrancas, to the bay of Santa Rosalia and the vast copper mines, which at the time of my visit employed three thousand laborers and supported entirely the town of seven thousand inhabitants. The property is owned by a French company, and comprises 50,000 acres on which about one hundred copper mines have been developed and are in operation. A mile and a half of new tunnels in the compact volcanic mud are run on the average daily, and 750 to 800, or even 900, tons of ore handled. Six large ships and a small steamer were in the bay at the time of my arrival—all on the business of the company. The best ore in the mines yields 35 per cent copper, but they were working at that time on 5 per cent ore. Labor receives \$1.25 a day in Mexican money. But the laborers have to pay the company rent for their houses and buy all their supplies at its store, which re-

duces the actual wages paid very materially. The company's store alone is said to pay a profit of half a million a year. Water is piped to the town a distance of about ten miles. Vegetables are all raised at a distance. It is still a desert—if not an uninhabited country, and I hailed with pleasure the monthly visit of the San Francisco steamer, the Curacoa on a holiday Sunday, which landed me Monday morning in Guaymas harbor, where I was once more—in touch by wire and rail with the rest of the world.

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SHELLS.

CALIFORNIA PEARL SHELLS.

Haliotis Cracherodii, Leach, is one of the most beautiful shells, and is the common trade species so well known on the Pacific coast as the abalone. Its more poetic name is the California pearl shell, from its clear white color, delicately tinged with rose purple, more rarely showing lustrous green or blue colors. The epidermis is smooth dark olive, hence this variety is commonly called the black abalone in distinction from its larger congener, *H. splendens*, known as the blue abalone. Monterey, Cal., was the original locality of the type. The shell may be described as 110-125 mm. long, 90-100 wide, about 40 high; usually 5-7 holes 5-12 mm. apart and 3-5 in diameter; interior pearly white with rose iridescence; scars of the closed holes showing nearly to the apex of the shell in perfect specimens, and especially plain in polished specimens.

Tons of these shells along with *H. splendens*, are annually collected by Chinese and other fishermen, especially on the rocks at low tide off the west coast of Lower (or Baja) California. The shells are mostly shipped to Germany and there manufactured into buttons and toilet articles. The snail is taken from the shells and dried, the meat usually shipped to China for food, where it is esteemed a great delicacy. The meat when fresh and properly cooked is certainly delicious, and is best when pounded to a pulpy mass and fried in butter.

Some consider that there is great danger of these shells becoming practically extinct in the California waters, and legislation for their protection (so far ineffective) has been passed in several of the coast counties. This species sometimes yields very beautiful pearls, but very rarely symmetrical in form, usually irregular, at times assuming a triangular or tusk-like shape that is very remarkable. These pearls are valuable as specimens, and the writer has often paid \$1 to \$5 apiece for unusually beautiful specimens, and even as high as \$20 for a very perfect specimen half an inch in diameter. But very pretty ones can be purchased

in our stores for 25 cents to 50 cents each, that will be valued in any collection.

Var. *splendidula*, Williamson, is a form of *H. Cracherodii*, with some of the coloring of *H. splendens*.

H. Californiensis, Swainson, is a very rare form, usually small, shorter and deeper than the type, with 9-16 smaller nearly round holes; a specimen 100 mm. long, 75 wide and 33 deep, is probably typical. This is generally from more southern waters, being described from Guadalupe Island and southward. A specimen collected by the writer at San Diego, Cal., is 165 mm. long, 126 broad, 60 high, with 10 holes 3-5 mm. in diameter, and showing 23 closed holes—the smallest 1 mm. in diameter. This is commonly considered as a variety only of *H. Cracherodii*, but is as well worthy of specific rank as many of the new species being described.

H. Bonita, Orcutt, is a new form recently discovered by the writer, from "near Santa Barbara, Cal.," 105 mm. long, 85 wide, 35 deep, with 13 long narrow holes close together, without showing scars of any of the closed holes and characterized further by the very large, rough muscular impression (50 mm. in greatest diameter), forming a most beautiful "pearl" and showing equally well from the inside or outside in the polished type specimen before me. It is evidently rare, and may be from Mexican waters.

H. Rosea, Orcutt, is another rare form apparently unnoticed by conchological writers, the specimen before me, 125 mm. long, 90 wide and 40 deep; 7 holes and another half enclosed, showing scars of 23 closed holes; not as heavy as the typical *H. Cracherodii*, it is further distinguished by the rich and extremely beautiful reddish epidermis.

H. splendens, Reeve (now called *H. fulgens* by most conchologists, as being the older name), is the famous blue abalone, flatter grooves, brilliant with lustrous blue and green iridescence Holes 4-7. Not rare on rocks below tide from Catalina Island to Cedros Island, and probably further south. One a foot in length is reported.

H. rufescens, Swains, is the famous red abalone of Monterey, Cal., large

flatter, waved, 3-5 holes, with rich orange-red epidermis. It adds brilliancy of color to any collection. One specimen has been reported from San Diego and I have found a few between Todos Santos and San Quintin bay, Lower California, but apparently rare outside of Monterey bay. A specimen $7\frac{1}{2}$ by 10 inches is one of the largest specimens I have seen.

H. corrugata, Gray, is a large arched very rough shell, with 3-5 holes around which the shell forms prominent tubercles with acute edges. Occurs from Santa Barbara to Cedros Island. Margin of shell crenulated. Not common.

Var. *diegoensis*, Orcutt, is a peculiar form of this shell, margin not crenulated, and shell comparatively smooth and not elevated around the holes as in the type, or less prominently so. A specimen before me is 150 mm. long 130 wide, 65 deep, greatest diameter of the interior muscular impression or "pearl," 100 mm., rough; interior dull mottled greenish brown and bluish iridescence. This was taken near La Jolla and evidently enjoyed a long but stormy life. This variety I believe has never before been described.

H. assimilis, Dall, is a small species found only in deep water off San Diego near the Mexican boundary. It is the smallest of our species, more elevated than *H. splendens* and thin but otherwise resembling that shell.

H. kamtschatkana, Jones, is slightly larger than *H. assimilis*, thin, arched waved, 4-5 holes, found in Japan and from Straits of Fuca to Monterey.

H. aquatilis, Reeve, is yet another species occurring at Sitka and in Japan, but not reaching southern waters.

The trade in these shells is very considerable, but only the two species, *H. cracherodii* and *H. splendens*, are sufficiently abundant to be of great economic value.

They are not exclusively peculiar to Californian waters, some species being found in far remote seas, and several handsome species occurring in Japanese and Chinese waters. They are often called ear shells in other lands because of their shape resembling a human ear. Though they are abundant on the west coast of Lower Cali-

fornia, strangely enough they seem to be absent from the waters of the Gulf of California, where thrives the pearl oyster shell.
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Maclara aurantiaca Nutt. Gen. Am. 2:234

The osage orange or Bois d' arc (bow wood), so called because much used by the North American Indians for making bows, is a tree varying from 20 to 60 feet in height, according to soil and situation. Its wood is bright yellow, close grained, very elastic, strong and hard. G. W. Dunn in the Union, Jan. 15, 1900, in answer to an inquiry, says:—"The wood wastes away by the action of the weather, a rotten or decayed stick is never seen. The wood changes but little with alternate wetting and drying, and is regarded as especially valuable for wheels. Takes a fine polish."

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West American Scientist



Volume XI. No. 3.

April, 1900.

Whole No. 87.

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 Engelm., 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 Engelm.

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.

Engelm., 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. III] fide Engelm. l. c. 74.

M. PHELLOSPERMA Engelm.

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 homogenous."—Engelm., 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 recurvatim 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. 111. 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 recurvospina]:—"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. recurvospina 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 tomentosis; aculeis radialibus 12-15 robustis inferioribus robustioribus sæpe 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. 25. 1856.

- Engelm. Cact. Mex. B. II. 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 periiit 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 tomentosis tandem nudis, mamillis magnis crassis supra sulco profunde exaratis, junioribus hemisphaericis senioribus rhomboideo-depressis latissimis, pulvillis mox nudis; aculeis exterioribus subæqualibus 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, magnimamma, 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-sphacclatis; 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, Seem. 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, ascendentibus 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, concis, applanatis, sulcatis; aculeis rectis radialibus, sub-10 albidis, centralibus 3 fusco-atris, 2 minoribus sursu inversis, 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 Eng. = *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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CONTENTS:

Little wild neighbors.	25
West American Mollusca.	27
Catalog of fossils.	36
Publications received.	35
Editorial.	
Notes and news.	
Ex changes.	
Wants.	
Queries and answers.	

Contents of some late issues:
California Pearl Shells.
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THE BLUE COPPER GROUP OF CLAIMS.

This group is situated in the base of the north slope of the San Bern rd no range of mountains near the edge of the Mohave desert, and lies 21 miles a little south of east of Victor station on the Southern California Railway. A wagon road is within 60 y rds of the claims, and an expenditure of \$ 0 would complete a good road to a poin in the canyon, a few rods below where the tunnel should be run into the "Wahkee."

The group comprises the "Blue Copper," "San Diego," "Wahkee" and "Ventura" claims, with mill site and water right.

The Wahkee lode crops out boldly, in the right hand wall, looking up stream, of a deep gorge or canyon that intersects it. This is the point of discovery, and the claim extends 1500 ft., across an intervening high point to a parallel deep canyon. The lode is in the contact between granite and lime. It is proposed to develop this claim by a tunnel from the canyon at the point of discovery, running lengthwise into the lode. At a distance of 150 ft. from the mouth of the tunnel, the tunnel would be 100 ft. vertically underneath the surface. At this point the cropping indicates a probable width of 50-60 ft.

The "Blue Copper" claim parallels the Wahkee, about 400 ft. further up the mountain, and while in places it crops through the lime, it generally follows the upper contact,—the upper edge of the lime cap, that rests upon the granite. At a point midway on the claim, and at a point higher up the steep right hand wall of the canyon some development work has been done. The dip of the vein is toward the Wahkee lode, as is the dip of the upper line of contact, which this vein follows.

The Ventura is the easterly extension of the Wahkee, the San Diego the westerly; the lode has been traced for 4 or 5 miles on the surface.

There are now from 10 to 15 tons of ore on the dump and down the steep slope of the canyon. A general assay of surface ores from the outcroppings of the ledge yielded 17 per cent. copper, considerable silver and some gold. An assay of average ores taken from the mines, returned 33 1/2 per cent. copper, 60 oz. silver, and 3/4 oz. g. dd. Malcolm Matheson.

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LITTLE WILD NEIGHBORS.

Let a human being go into the wood as Henry D. Thoreau did at Walden Pond, and camp down among the birds and animals, with a heart as innocent of harm, as simple and loving as their own, and quickly the little creatures of the forest will adopt him into their common family. It seems unnecessary even that he should attract their attention or provoke their gratitude by making them offerings of food. If his heart is full of friendliness and companionship, they find it out very soon, and come to live beside him for pure sympathy's sake. If he chooses to feed them, they will accept the gift gratefully, as would any friend; but their affection is not purchased. They give it freely, and would continue to give, if their new friend and companion had never a crumb to fling them.

My observation teaches me that birds, especially, are perpetually hungering for and seeking the love and companionship of man. Even in spite of the general destructiveness of mankind, how the little tribes of the air flock to settled parts of the country and hover about human dwellings, deserting the safe depths of swamps and remote forests, to nest in the orchard, the grove, and the 'deep tangled wildwood' that borders the edge of the farm. And all this out of pure longing for human companionship. I cannot help thinking, sometimes, when I hear a full-throated bird singing as if his heart would burst, in the grove back of my house, that he is really thanking me and mine for the cheaply-accorded privilege of living near us and being thrilled by the sweet sense of human companionship. He is so thankful we do not kill him and put him in a pie, and mount his skin upon our hat, that he pours out freely for us, all day long, a song that is sweeter and more soulful than many we have purchased the privilege of listening to. Last fall, there was a sparrow that came two or three times a day and perched on the sill of the open pantry window, just to be chirped to by my wife. He was not physically hungry, for he seldom touched the crumbs we threw him—it was his little heart that was hungry, I think. He would always come at such times as my wife was accustomed to be in the pantry and, lighting on the sill, would give a little shrill, interrogatory chirp, as much as to say: 'Good morning. How are you today?'

Then my wife would chirp back to him, and he would flutter his little wings with delight, hopping back and forth and answering her talk with language as full of gratitude and affection as any

I ever heard. It was a conversation well worth listening to, and often the whole household has stood, a pleased and smiling audience, just outside the pantry door.

It is said that a dog is a better intuitive judge of character than any human being, but I am sure that the little wild creatures of the woods and fields are equally good intuitive judges of disposition. There are some persons who constantly attract birds and animals to themselves by what we might, literally, call the magnetism of love.

A friend of mine, while tramping along a mountain road, last summer, sat down to rest on a log by the wayside. Presently, a bright-eyed red squirrel came 'hitching' down the trunk of a tree near by, stopping to look questioningly every few feet. My friend simply sat still and watched the little fellow. Growing bolder, or rather, as I explain it, more assured of the disposition of the man on the log, the squirrel presently made a dash from the tree, skurried up on my friend's shoulder, bounded to the earth again, and ran off 'laughing,' my friend says, 'as distinctly and merrily as ever I heard any human being laugh.' In two or three minutes he was back again, frisking about my friend's feet, and ended up by perching on the toe of his boot and chattering amiably at him.

Here was an instance of unerring perception of disposition on the part of one of the shyest of wood creatures, and an evidence of the naturally friendly and loving characters of the little wild-folk about us. My friend is one of the gentlest and sweetest of men, and that squirrel divined the love in his heart and knew it would be both safe and sweet to make his pretty appeal to it.

It is not difficult to disarm the suspicion and distrust of any wild creature, if one be sincere and genuine in his friendly advances. A bird or animal quickly grows accustomed to the human presence, and, as soon as it sees that no harm is intended, learns to welcome it. Even a pair of nesting birds, at a time when distrust and fear are, naturally, uppermost in their hearts, will come to greet a really sympathetic visitor with chirps of joy instead of cries of fear. I remember a pair of thrushes whose hearts were well-nigh broken with distress when I first discovered their nest in the woods; but afterwards, the oftener I came and sat upon a knoll near by the gladder they seemed to be; and I really think they felt a comforting sense of security when they flew away for a time and left their babies to my protection.

If we are right minded toward them, the out door world is full of little creatures who will share with us the purest and sincerest and most delightful friendships. There is no treachery, no selfishness, no ulterior motive in their love. It is more like the affectionate and utter devotion of a child than the deliberating, reserved and cautious friendship of an older person. Thoreau

found it an all-sufficient recompense for the absence of human society. But better still, if, without renouncing the attachments and companionships of our kind, we can add to them some charming friendships with the little wild-folk of wood and field.—James Bucham, in *N. Y. Observer*.

WEST AMERICAN MOLLUSCA.

The last twelve or fifteen years have been prolific in changes in the nomenclature of our shells and in discoveries of new varieties and species. The following descriptions are in many cases compiled from the original publications cited.

PUPA CALAMITOSA Pilsbry, *Phila ac pr* 1889 411, t 12, f 16-17.

Shell cylindrical, very blunt at apex, chestnut colored; whorls $4\frac{1}{2}$, the first $1\frac{1}{2}$ smooth, the following regularly costulate striate, the costulae separated by spaces wider than themselves; last whorl abruptly turning forward, rounded beneath, encircled by a slight central constriction or furrow; aperture about $\frac{1}{4}$ the total length of shell, rounded, truncated above, contracted within; peristome thin, expanded, without crest or callous thickening behind; columellar margin rather dilated; parietal wall bearing 2 entering lamellae, 1 arising near the termination of the outer lip, the other more deeply seated, elevated, entering less obliquely; columella with a strong white deep-seated obliquely entering fold; outer lip with 2 short white lamellae. Altitude 1.7, diameter .8 mm. Near the mouth of the Santo Tomas river, Lower California, collected by Heury Hemphill; and near San Diego, Cal. by Orcutt.

MYOFORCEPS ARISTATUS Dillwyn.

'My friend, F. W. Kelsey, of San Diego, Cal., recently sent me a peculiar Lithophagus, taken near that city, which I at once recognized as a *Myoforceps*, and Dr. Dall afterwards kindly determined the species as *M. aristatus* Dillwyn. The finding of this interesting species, with its elongate, crossed ends, in shell ground which has been well worked for so many years, is worthy of note and to the credit of the enthusiastic collector named. The fact that mature specimens are found imbedded in hard rock is proof that it is not of very recent introduction.'—Fred. L. Button, *Nautilus* 13:131. March 1900.

FUSUS ROPERI Dall.

'Shell small, rather short and wide, with a short, subacute spire and almost 6 whorls; color ferruginous brown, faintly spirally zoned and lighter on the siphonal fasciole, pillar and throat whitish, outer lip between the white of the throat and the margin showing narrow spiral brown lines on a yellowish ground, whorls with a tendency to a white, narrow peripheral line most evident on

the summits of the ribs; whorls excavated behind, somewhat rounded before the periphery, the margin at the suture strongly appressed with the whorl in front of it somewhat constricted; suture distinct, hardly undulated, the spiral thread in front of it slightly minutely imbricated; axially directed sculpture of finely wrinkled silky incremental lines and (on the last whorl) 9 rounded ribs with rather wider interspaces, the ribs are obsolete near the suture, on the early whorls, and on the base; spiral sculpture of numerous flat strap-like threads with the interspaces much narrower and sharply reticulated by the incremental sculpture which rises in the interspaces nearly to the level of the tops of the threads; the nucleus (lost) is small, the first 2 or 3 whorls are more coarsely reticulate than the later ones; aperture elongated and insensibly passing into a rather wide and short canal; siphonal fasciole rather marked, though the siphon is not recurved; pillar smooth, nearly straight with little callus; the body with no subsutural callus; the outer lip slightly flaring, hardly thickened; lon. of shell 26, of aperture 15.5, lat. 13 mm. San Pedro, Cal., in rather deep water, E. W. Roper; in whose honor the shell is named. This is a singular species, recalling *Ocenebra* or *Muricidia* by its surface sculpture and the constricted and appressed sutural region of the whorls. I have not been able to find any species with similar characters in the monographs or in the national collection. It is probable that it should be separated sectionally from the group typified by *F. colus*, and it cannot be associated with *Sipho* or *Chrysodomus*, so it may be regarded as typifying a new section, *Roperia*.—Dall, *Nautilus*, 12:4-5, May 1898.

VITRINELLA WILLIAMSONI Dall.

Shell small, white, with $2\frac{1}{2}$ whorls; spire flattened; suture appressed with a shallow channel or excavation outside of the appressed margin of the whorl, outside of which the convexity of the whorl rises higher than the suture. Base slightly more rounded than the upper side, with a wide and flaring umbilicus; periphery rounded; aperture rounded, oblique; surface polished, finely striate here and there by the incremental lines which are most prominent above. Maximum diameter of shell, 5.5; minimum diameter, 4.5; altitude 1.25 mm. Beach at San Pedro, Cal.; U. S. National Museum, registered number 106,855. This species, which is rather large for a *Vitrinella*, is respectfully dedicated to

Mrs. M. Burton Williamson, to whose researches this paper is due. The name being inherently masculine, the usual genitive ending is preserved.'—Dall, U S Nt Mu, pr, 15: 202, t 21, f 2-3. 2 Ag 1892.

DORIS SANDIEGENSIS J. G. Cooper, Cal ac pr 2: 204.

Pale brownish yellow, with large annular brown spots irregularly scattered, varying from 10-20, or entirely brown. Surface slightly rough, sometimes a little tuberculate. Dorsal tentacles conical, retractile; branchiæ large, rising in 5 parts which become tripinnately divided, expanding so as to cover the posterior $\frac{1}{2}$ of the body like an umbrella. Mouth proboscoidiform, with 2 short lateral tentacles. Length $3\frac{1}{2}$, breadth $2\frac{1}{2}$, height $\frac{1}{2}$ inch. Numerous among sea-grass on mud flats in San Diego bay, Cal., from November to May.

Among my notes I find:—'animal dirty white, $\frac{3}{4}$ inch long; mantle with 5-10 or more circles of dark brown irregularly placed along the edge of the thick mantle.'—Orcutt, number 23, from San Diego, identified by Dall as this species.

Cooper doubtfully placed in the section *Actinocyclus*, and has reported 2 specimens from Santa Barbara, with tentacles conical, acute, and states that the branchial orifice does not agree with the 'peculiar characters of *Actironotus*.' Bolinas bay.

AMPHISSA RICOLOR Dall.

'Shell small, solid, pale with brownish bands and 6 convex whorls; nucleus eroded in the specimens; suture distinct, not appressed, whorls full, with 11-13 narrow rounded ribs extending nearly from suture to suture; spiral sculpture of numerous flattened strap-like cinguli separated by subequal channeled shallow interspaces; epidermis thin and yellowish; color of shell pale straw color with a brownish base and a brown band extending from the periphery half-way back to the suture; aperature about equal to the spire, the penultimate rib behind it a little swollen; pillar slender, polished white with little callus; canal wide, short, recurved; outer lip simple, slightly reflected; not lirate inside. Longitude of shell, 14; of aperature, 7.7; maximum diameter of shell, 8 mm. Habitat: Dredged by the U. S. Fish Commission at various places off the coast from Point Sur to San Diego, and in the Santa Barbara channel in depths varying from 124 fathoms at the south to 298 fathoms at the north, over a sandy or muddy bottom. The operculum is brownish and resembles that of *A. versicolor* Dall.

The brown coloration, though generally disposed in bands as described, is variable, and occasionally appears in a zigzag pattern on the pale ground, or generally suffused over the surface, or even maculated, as in *Nitidella*. The apex when perfect is probably moderately acute, but is more or less eroded on all the specimens.' —Dall, U S Nat Mus pr 15: 213, t 20, f 4. 2 Ag 1892.

PUPA STERKIANA Pilsbry, Phila ac pr 1889, 412, t 12, f 2-3.

Shell rimate, perforate when young, cylindrical, blunt at both ends, chestnut-brown; surface obliquely sculptured with strong, rather irregular costulae, which often split or branch, suture very deeply impressed; whorls 7, the first one smooth, the last 5 of about equal diameter, very convex; last whorl a little ascending to the aperture, without crest or scrobiculation behind the peristome; aperture a trifle oblique, rounded, truncate above; lip expanded, continuous, thin, white, without teeth or folds; umbilicus deeply impressed, appearing very narrowly perforated. Alt. 4, diam. 1.5 mm. On *Rocella leucophœa* both north and south of San Quintin bay, Lower California (C. R. Orcutt No. 1322), and first distributed as *P. chordata* Pfeiffer. Named in honor of Dr. V. Sterki, whose special studies of these minute species has added much to our present knowledge.

EPIPHRAGMOPHORA HARPERI Bryant.

Shell umbilicate, translucent, white; suture well defined; spire a depressed cone composed of 5 regularly increasing convex whorls, the first 3 smooth, the remainder marked by obscure, closely crowded, oblique lines of growth; base convex; aperture nearly circular, oblique; peristome thin, broadly expanded, and reflexed at lower third of baso-columellar portion, its extremities joined by an elevated ridge, bordering which is a somewhat triangular callus bounded on the inner side by a ridge extending from the middle of the base of the reflected portion of the peristome obliquely to the upper part of the basal whorl; width of umbilicus about one-fifth greater diameter of shell. Numerous dark microscopic lines extend from the peristome over the body whorl nearly perpendicular to the lines of growth. (Greatest diam. 17, least diam. 14, alt. 9 mm. San Jacinto mountains, California.' —F. W. Bryant, *Nautilus*, 13: 143. Ap 1900.

EPIPHRAGMOPHOBA BOWERSI Bryant.

'Shell umbilicated, convex; epidermis olivaceous; spire slightly elevated; whorls between 4 and 5, convex, gradually increasing; suture well defined; aperture transverse, nearly circular; peristome whitish, thin, very slightly expanded at the basal portion, at the columella broadly reflected, yet leaving the umbilicus entirely open, showing within the whorls to the apex; base convex. A well defined, moderately broad, light-chestnut band revolves above the center of the body whorl, and is visible above the suture on the whorl preceding the last; lines of growth close and distinctly marked. Greater diameter 13, lesser 10, height 6 mm. San Jacinto mountains, Riverside county, California.'—F. W. Bryant, *Nautilus*, 13:143. Mr 1900.

CHRYSODOMUS ITHIUS Dall.

'Shell slender, acute with 7 rounded whorls, distinct suture, surface sculptured only with lines of growth and of a pale purple brownish tint. Aperture moderate not flaring, canal short. Length 70, of aperture 32, breadth of shell 30 mm. U. S. Steamer Albatross, station 3202, off the coast of California in 382 fathoms. Extremely perfect young specimens show a few faint spirals occasionally.'—Dall, *U S Na Mu* pr 14:187. 24 J1 1891.

SIGARETUS OLDROYDII Dall.

'Shell large, thin, naticoid, with a short spire and 3-4 inflated whorls; color pale brown, livid on the spire, fading to waxen on the base; surface sculptured with extremely fine wavy spiral striae; aperture ample, oblique, the outer lip thin, a little patulous, the body covered with a thin callus, the pillar lip obliquely cut away, wide near the junction with the body, the basal part of the margin receding; umbilicus large, pervious, its walls covered with a thin, silky, brown wrinkled epidermis. Alt. 3.5, diam. 37 mm. A single specimen in deep water off Catalina Island, California, collected by Mr. and Mrs. T. S. Oldroyd. This species is easily distinguished from any other recorded, by its very thin shell, naticoid form and wide pervious umbilicus.'—Dall, *Nautilus*, 11: 86. D '97.

PUNCTUM CALIFORNICUM Pilsbry.

'Similar to *P. conspectum* in the small, deep umbilicus and color. Spire somewhat more elevated; whorls fully 4, closely revolving, the last decidedly narrower than in *conspectum* (viewed from above). Surface lusterless, with fine, even, hair-like stria-

tion, and in places showing faint traces of spiral striæ. Umbilicus narrow and deep, its width contained $4\frac{1}{2}$ times in greatest diameter of the shell. Aperture wider than high, shaped much as in *P. conspectum*. Alt. 1.14. greatest diam. 1.85 mm. Fish Camp, Fresno county, California.—Pilsbry, *Nautilus*, 11: 134. Ap 1898.

CÆCUM ORCUTTI Dall.

'Shell small, stout, smooth but not polished, light warm brown in color and without sculpture, excepting slight lines of growth. Shell slightly curved, the anterior aperture very oblique, about at right angles to the plane of the diameter of the plug, the superior margin being the anterior; plug glandiform, smooth, rounded without mucro; operculum brown, thin, smooth. Lon. of shell 2; diameter .75 mm. San Diego, California, abundant under stones (C. R. Orcutt). This is the smallest and the only smooth Californian species of the genus.'—Dall, *U S na mu pr* 8: 541.

DORIS MONTEREYENSIS Cooper *Ca ac pr* 2: 204.

Pale yellowish with scattered black spots (or entirely brown?), mantle rough tuberculate, or nearly smooth, dorsal tentacles knob-shaped, branchial rays bipinnate, short, in 8 divisions, forming a crown-shaped expansion on the posterior third of the dorsum. Foot expanded into a broad, thin margin, as wide as the mantle. Length 3, breadth 1, height $\frac{3}{4}$ inch; form elongated oval. Dredged in 6-10 fathoms, in Monterey bay, California, adhering to fragments of sandstone. Dr. Frick found small specimens, apparently the same, in San Francisco bay, California.

Santa Barbara: at low water, larger in size and deeper color; tentacles club-shaped, the branchial 7-8-parted, bipinnate and from one opening.

Orcutt, No. 19 (young? fide Dall), from San Diego, appears described among my notes as follows:—animal translucent white, an inch or less long, the back of mantle liberally sprinkled with irregular dots and blotches of brownish black which are most conspicuous just behind the tentacles, near the center of the back, and just forward of the branchiæ.

DORIS ALABASTRINA Cooper, *Ca ac pr* 2: 204.

§*Asteronotus*? 'Alabaster white, opaque, form depressed-oval; dorsal tentacles short, acute, branchiæ of 12 simple rays expanding in the posterior fifth of the body. Length 4-tenths, breadth 3-tenths inch. Under stones, San Diego bay, only one found.'

DORIS SANGUINEA Cooper Ca ac pr 2: 204.

§*Asteronotus*. Brilliant red, with few large black spots irregularly distributed, surface smooth; dorsal tentacles short; branchiæ composed of 8 simply pinnate rays, expanding close to the posterior end of the body. Length $\frac{1}{2}$, breadth $\frac{1}{4}$ inch, height about the same. Under stones in San Diego bay, rare.

Orcutt No. 22, among sea-grass and under stones on rocky beaches. Cooper, Ca ac pr 3: 58, reports:—'4 specimens from Santa Barbara with *D. montereyensis*. Differ from original in having the black spots very small. Tentacles acute, cylindrical-conic, retractile into a cavity bordered by a toothed membrane. I cannot discover the stellate valvular structure of the branchial opening which characterizes the genus *Asteronotus*, in these specimens.'

DORIS ALBOPUNCTATA Cooper Ca ac pr 3: 58 (1863).

'Form ovate, pointed behind, flattened, surface shining, minutely rugose. Tentacles club-shaped, retractile, branchial plume 6-8-parted, bipinnately divided, situated near the posterior extremity. Color yellow or orange brown, dorsal surface thinly speckled with small white dots, each forming a slightly raised papilla. Beneath paler. Length about 1, breadth $\frac{1}{2}$ inch. Dredged from a rocky bottom in 20 fathoms a mile from the shore at Santa Barbara. Also found on rocks at low water mark near the N. W. end of Catalina Island. Bolinas bay.

Orcutt No. 25, San Diego.

NAVARCHUS INERMIS Cooper.

'One small specimen dredged among seaweeds in 10 fathoms, near the eastern shore of the 'Isthmus' of Catalina Island shows no variation from San Diego specimens.'—Cp Ca ac pr 3: 58.

Under *Strategus inermis*:—'Vinous purple, ornamented with numerous rounded or oblong yellow spots: inner surface of enveloping folds, flesh-color. Edge of mantle and tail orange, with a narrow band of rich blue, forming a scalloped edging alternately blue and gold; a row of alternating spots of the same along the center of the ear-like processes. Under surface of tail deep purplish-blue. Whole surface perfectly smooth and shining. Eyes white with a black pupil. Length $3\frac{1}{2}$, breadth $\frac{3}{4}$ inch. This beautiful animal inhabits muddy parts of San Diego bay, where I found it not uncommon in spring. It creeps among the grasses slowly and looks like a large caterpillar. Though without any

apparent means of escape or defense, it seems little molested by other animals. As an object for study in an aquarium for the investigation of the metamorphoses it doubtless undergoes, from the egg to its perfect state, it would be highly interesting. It is more highly organized than any other genus of Opistho-branchiata, resembling *Aplysia* more nearly than any other, and probably carnivorous or a carrion cater.—Cp Ca ac pr 2: 202.

APLYSIA CALIFORNICA Cooper Ca ac pr 3: 57.

Form and external appearance as usual in the genus. Length 15, breadth 5 inches, height about the same. Color pale gray or greenish, becoming purplish on the side, folds of mantle with scattered white specks, from which an irregular network of brown lines extends over the rest of the body, interspersed with large brown blotches. Inner surface of mantle varied with alternating painted bars of white and dark brown interlocking together. Sole of foot black. Eyes very minute. Shell contained in the substance of the mantle cartilaginous, translucent, trapezoidal or hatchet-shaped, margins rounded, slightly convex above, the nucleus or center in the old specimens distant from the posterior end or apex. Faint radiating lines diverging from the nucleus, crossed by an irregular network of darker lines, all ending abruptly at some distance from the margin, which has thus a wide, nearly transparent border. An accessory plate arises on the inner surface from the nucleus, spatulate in form and slightly raised. The 2 younger specimens have the clear border and accessory plate less developed, and very young ones do not probably show these characters at all, but resemble the typical *Aplysia* in the form of the shell. On this account I am unwilling to constitute it a new genus, but propose to call it a sub-genus under the name of *Neaplysia*. San Pedro, Cal., July 25, 1893, on beach after a heavy blow; 3 specimens. Stomach was full of large fragments of *algæ*. Kept in water for some time, they were very slow and uninteresting in movements, showing no evidence of any means of defense, except the exudation of a beautiful purple fluid from the mantle when handled.—Cp. Monterey, to Lower California.

PUBLICATIONS RECEIVED.

Alberg, Albert: Frost flowers on the windows the result of the vital energy of plants. Chicago, 1899, 25 p. *50c.

Whether fact or fancy this brochure will be read with some interest by a large class who desire to know the unknowable.

Bioletti, F. T. et A. M. dal Piaz: Bench-grafting resistant vines. Ca aes b 127, 38 p 9 f, 1900. 20c.

Patterson, H. J.: Experiments in feeding pigs for the production of pork. Md aes b 63, D 1899, 41p 10 pl. 30c.

Stinson, John T.: Second r on Ark seedling apples. Ark aes b 60, 12 p 4 f, 10c.

Newman, C. L.: The comparative yield of corn from seed of the same variety grown in different latitudes. Ark aes b 59. 10c.

Connell, J. H. et H. C. Kyle: Feeding steers. Texas aes b 55. 50c.

Aiken, Arthur: A manual of mineralogy. Am ed 1, 1815, 275 p, \$4

Mawe, John: Familiar lessons on mineralogy and geology. ed 10, 1828, 116 p, 5 pl (4 colored). \$2

—A new descriptive catalogue of minerals. ed 3 96 p 1 pl 1881 \$1

Phillips, William: An elementary introduction to the knowledge of mineralogy. ed 2, 1819, 417 p, \$5

Farm and fireside, Springfield, Ohio.

An econom'st, 135 W 23d st, N Y.

Mechans' monthly, Germantown, Phila.

Nautilus, 19th and Race sts, Phila.

Success with flowers, West Grove, Pa.

L. Habana medica, Muralla 89, Havana, Cuba.

Therapeutic Gazette, Detroit, Mich.

Strawberry culturist, Salisbury, Md.

Farmers' magazine, Madison, Wis.

Sanitarian, 337 Clinton st, Brooklyn, N Y.

Heller, A. Arthur: Catalogue of No Am plants north of Mexico, exclusive of the lower cryptogams. 160 p, \$60c.

Enumerates 14,534 species and varieties.

—*As a possible convenience for our subscribers we propose loaning any work in our library on receiving a cash deposit of the estimated value of the books loaned; a minimum fee of 5c on each note will also be charged, or 1 per cent. a month on total value. Suggestions will be welcomed on this subject.

—†Publishers' prices are thus indicated when known, and orders received at this office will be promptly forwarded with remittance.

- Botanical explorations in southern Texas during the season of 1894. 116 p, 9 pl, f#1.
- New plants from western No Am. Torr bot cl b 25: 193-201, 265-271.
- New and interesting plants from western No Am (continuation of above), pts 3-8.
- —Notes on plants of New Mexico. 30c.
- Notes on Kuhnistera. 40c.
- Preliminary enumeration of the lichens of Lancaster Co., Pa. Millsbaugh, Charles Frederick: *Plantæ Utowanæ*.—I. Catalogue of the species. fcm 43.
- Farrington, Oliver Cummings: I—New mineral occurrences. II—Crystal forms of calcite from Joplin, Mo. fcm 44.
- Chipman, M. M.: Preventive medicine. 24p, 25c.
- Rochester academy of science, proceedings iii pt 2.
- Société d'horticulture du Japon; Journal no. 92-94.
- Academy of natural sciences of Phila. proceedings 1899 pt 3.
- Hilgard, E. W.: Nature, value, and utilization of alkali lands. Caes b 128. 46 p, 50c.
- Hicks, Gilbert H.: The germination of seeds as affected by certain chemical fertilizers. D-A bot b 24.
- Colorado college studies, viii.
- Crandall, C. S. et C. H. Potter: Strawberries. Col aes b 53. 30c.

CATALOG OF FOSSILS IN THE ORCUTT COLLECTION.

- 43 *Inoceramus convexus*. Bad Lands, Dakota, L.W. Stilwell.
- 44 ———? From well near San Diego (Chollas valley?), Cal. H. C. Orcutt, Oct. 1887.
- 45 *Amiantis callosa* Conr. Spanish Bight, San Diego, Cal. 3 C. R. Orcutt, Jan. 2, 1888.
- 46 *Chione succincta* Val. From cistern dug at southeast corner 21st and J sts., San Diego, Cal., Sept. 13, 1882, 10 feet below the surface. H. C. Orcutt. 2
- 47 *Jauria* ———? East side of Chollas valley, d* J. H. Orcutt. 1 upper valve. Sept. 23, 1888.

d* indicates "San Diego, California."

Or† indicates "C. R. Orcutt collector."

- 48 Same, west side of valley, at residence. Jan. 39, 1886.
- 49 *Janira dentata*? With No. 46.
- 50 *Amiantis callosa* Conr. This and Nos. 51-54 with No. 45.
- 51 *Olivella bicipitata*.
- 52 " *boetica*
- 53 *Saxidomus nuttallii*
- 54 *Crepidula adunca*
- 55 *Ranella californica*. Nos. 55-60 collected by C. R. Orcutt in 1887, at San Quintin, Baja Cal.
- 56 *Sureula carpenteriana* 3
- 57 *Macron kelletii* 4
- 58 *Nassa californica* 27
- 59 *Lucina nuttallii* 10
- 60 Same 50
- 61 *Turritella cooperi* San Pedro Hemphill 2
- 62 Same with No. 55 85
- 63 Same? from 15 feet below the surface corner 8th and H, d—
Or† 1888. 5
- 64 *Arca*? Rose hill near Chicago—H. N. Rust.
- 65 *Anomalocardia diluvii* Sch. Siena, Italy—S. Brogi. 4
- 66 *Chione simillima* d
- 67 *Anomia lampe* d
- 68 *Lucicola alta* Nos. 68-72 with No. 45.
- 69 *Echinarachnius excentricus*
- 70 Same as No. 68.
- 71 *Tivela crassatelloides* Conr.
- 72 *Macoma secta* Conr.
- 73 *Pecten equisulcatus* Conr. d from Daniel Cleveland. 3
- 74 — Nos. 74-78 from Chollas valley, d
- 75 *Echinarachnius excentricus*? 4
- 76 *Neverita reclusiana* Petit. 2
- 77 *Cerithidea sacrata* Gid. 2
- 78 *Solecurtus californianus* Conr.
- 79 *Favos tes hamiltonensis*? Iowa City, Iowa, collected by J. W. Preston; a beautiful fossil coral (polished).
- 80 *Chione simillima* Sby. 13th and H sts., d Or 2
- 81 — *succineta* Val. With No. 80.
- 82 *Anomia lampe* Gray. Same data.
- 83 *Ostrea lurida* Cpr.

- 84 Petrified moss, Black Hills, Dakota, from L. W. Stilwell.
- 85 *Dosinia ponderosa*. Railroad lands, d Or 1881
- 86 *Vermetus arenarius* L. Pliocene, Sienna, Italy. S. Brogi.
- 87 *Balanus estrellanus* Conr, 16th and E sts., d Or, 60 ft. down.
- 88 'Fossil flowers,' Morris Ill. from H. N. Rust.
- 89 Coquina, St Augustine Fla. Mrs. R. W. Phillips, 22 My '83.
- 90 Bone, mesa d Mrs. Z. R. Cronyn.
- 91 *Lepidodendron*—? Youngstown, O. R. P. Manning.
- 92 Ferns, southern Ill. Miss L. P. Gray.
- 93 Calamite—? with 91
- 94 Ferns, coal measures, with 92
- 95 Algae. Ill
- 96 Pebble, containing fossils, Lake Michigan, Miss L. P. Gray.
- 97 *Lithostrotion proliferum* Ill.
- 98 Coral, Washington county, Ind. Miss Adelaide Reid.
- 99 Petrified moss, Spring Arbor, Mich. Miss Lydia P. Gray.
- 100 Trilobite, Jersey county, Ill. "
- 101 *Dentidium apuroum* Gmel. Pliocene, Jenese. S. Brogi.
- 102 *Turritella subangulata* Brac. " " "
- 103 *Natica millepuncta* L. " Siena Italy "
- 104 *Fusulina*—? Ill.
- 105 Ophiuran incrusted with algae, Pt. Loma, d Or 1879.
- 107 *Echinarachnius excentricus* in mass, Chollas valley d Or '85.
- 106 *Janira dentata?* d Or
- 108 *Lucina nuttallii*, Orcutt's addition, d Or 27 Ag 1888. 5
- 109 " —? do 3
- 110 *Pecten aquifulcatus?* do 24
- 111 *Balanus estrellanus*—opercula, with 87. 24
- 112 With 108.
- 113 *Cardium*—? with 45. 4
- 114 *Chione succincta* Val. NE cor J & 18th sts., d Or, 1 Ap 1888
- 115 *Dosinia ponderosa* d Or 3 1
- 116 *Solecurtus californianus* d Or 5
- 117 *Neverita reclusiana* d Or
- 118 *Echinarachnius excentricus* d W. R. Lighton.
- 119 *Cardium quadragenarium* d "
- 120 —procerum d Or
- 121 *Crucibulum spinosum* d W. R. Lighton. 45
- 122 *Ostrea lurida* d "

QUERIES AND ANSWERS.

Questions of general interest will be answered under this department as far as possible; when a personal answer is desired enclose stamp please; if a question is not of general interest, or necessitates special research, or copying is to be done, compensation by the hour will be required.

Q—Have you for sale copies of the California botany of Brewer and Watson, either or both volumes, new or 2nd hand? H M H

A—No, but can obtain a copy, 2 volumes, new, for \$12.

EDITORIAL.

'Little Wild Neighbors,' by James Buchan, is an ideal sketch which we believe many of our friends will be glad to read; but it seems as if the author had missed the essence of his observations. The egotism of man is proverbial, but it is not man that causes bird or animal to look up to him—it is the natural instinct, inherent in man and beast alike, to seek a higher intelligence than their own. Just as the power of gravitation is the attraction that a large body has for a smaller, so love may be called the attraction of a superior mind for the weak. Man attracts until he teaches fear of injustice at his hands to the lower orders—even then the attraction and silent admiration remains a powerful force. The natural desire for approbation creates a bond of sympathy—gives the weak power over the strong. The paucity of the English language does not permit us a different word—nor do we need it—love is all sufficient.

'The West American Scientist is the best journal of information for the young botanist and scientist,' remarks one of our correspondents. We intend to make this true,—if not true already for strange to say we know of no rival for the honor! It is not our wish to encourage boys in robbing birds' nests under the plea of science; nor to incite them to collect 'specimens' with a view of ultimately selling at fabulous prices; such hopes only lead to disappointment. Observers are needed everywhere, but we would emphasize one point—the best work in nature studies is not done for pay! It is well to bear the practical side in view, but not to the exclusion of truth. As means of possible assistance to naturalists young and old we open free our exchange, want, and query departments, and would ask for the reader's co-operation.

NOTES AND NEWS.

Lazulite or lapis lazuli is a recent addition to the minerals of the United States, a specimen of this rare and beautiful mineral having just been sent to the editor by a subscriber, who obtained it from the mountains north of Ontario, in Los Angeles county. Its chief use is said to be in the manufacture of ultramarine paint.

Zoe, it is said, is soon to take a new lease of life; it is hoped that San Diego climate may agree with it better than S. F.

Our old contributor, Dr. Frank A. Blaisdell, is removing to Cape Nome, where we trust he may find beetles to his heart's content, and incidentally fill his pockets with rocks.

Prof. Josiah Keep is engaged upon a new edition of his book, 'West Coast Shells.'

An apparently new species of *Nolina* was recently found in flower near Temecula, along with *Tetracoccus dioicus*.

A train of 59 cars recently left California for the east, containing 21,712 boxes of oranges.

Joseph Henry said:—"My ambition is to add to the sum of human knowledge by the discovery of new truths, which may be of some use to the world. The practical application of these I leave to others."

Frank Stephens is engaged on a work descriptive of the birds and mammals of California.

C. R. Orcutt expects to soon issue a new edition of his Southern and Lower California Flora, with some descriptive matter added; the work will be materially enhanced in value.

Echinocactus Johnsoni is bearing green flowers with us now—instead of purple; will some one tell us how to make it follow its description?—or shall we give it a new name!

WANTS.

Rev. Edward C. Mitchell, 534 Summit ave., St. Paul, Minn., will buy any genuine ancient American copper relics; any extra large ancient stone spears; any pre-historic relics originally found in Minnesota.

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Volume XI. Number 5. June, 1900. Whole Number 90.

THE
West American Scientist.

CONTENTS.

WEST AMERICAN MOLLUSCA.

INSECTS OF THE WEST.

D. W. Coquillett and C. R. Orcutt.

EDITORIAL.

QUERIES AND ANSWERS.

ABBREVIATIONS.

NOTES AND NEWS.

WEST AMERICAN SCIENTIST: 365 Twenty-first St.,
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THE
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Volume XI. Number 5. June, 1900. Whole Number 90.

WEST AMERICAN MOLLUSCA,

OCINEBRA GRACILIMA.

"Shell small, solid, fusiform, slender; spire subacute; whorls 6-7; body whorl about two-thirds the whole length. Upper part of whorls subangulate, aperture about as long as the spire. Outer lip thickened internally; white, with 4 prominent denticles. Columellar lip excavated, callous, with a purplish stain showing through the enamel. Canal moderate, closed. Surface smooth, with numerous fine whitish revolving costae, dotted with brown, the interspaces near the outer lip with brown linear markings. Upper whorls longitudinally nodosely ribbed. General color olivaceous, with patches of yellow. Lon. .5; Lat. .25 in. Habitat.—San Diego, California, 10 fms.: Hemphill."—Robert E. C. Stearns, Conchological memoranda, No. 6 (May 18, 1871); "Am J Conch 7:— (1871) with f."

Under stones. San Diego.—Or U S Na mu pr 1885, 535.

"A few at Point Fermin," near San Pedro, California, fide Mrs. Williamson (U S Na mu pr 15: 215).

PHOLAS PACIFICA.

"Shell, oblong, beaks two-fifths of length of shell from anterior end; anterior end of valves triangular, pointed; anterior dorsal edge of valves reflected and folded down on the umbos; lower anterior margin curved, forming a large elliptic-oval gape; posterior end of valves squarely rounded; shell dull chalky white, sculptured in concentric lines, which anteriorly are lami-

nated and posteriorly become extinct; valves radiantly ribbed, which also become obsolete at the posterior end; at the intersection of the radiating and concentric lines the sculpture is pectinated; an area below the umbos, nearly or quite destitute of sculpture, which varies much in prominence in different specimens; accessory plate sub-lanceolate and bent down on the beaks, anteriorly prolonged over but not covering the ante-umbonal gape; interior of valves white enamelled; internal rib short, curved and flattened. Largest specimen, two and six-tenths inches in length, and one and five-tenths inches in height. Habitat—Alameda, San Francisco bay, California, where in some places it is common in sandy mud between tide marks. Numerous specimens collected by Messrs. Harford, Hemphill, Drs. Kellogg and W. P. Gibbons.”—Robert E. C. Stearns, Conchological memoranda No. 7 (28 Ag 1871) Ca ac pr 5:—t 1. i6, 6a, 6b, 6c, (7 Ap 1873).

Mrs. Williamson (U S Na mu pr 15: 183), reports “three or four washed ashore with the tide” at San Pedro bay, California, and adds “single valves not plentiful.”

PTYCHATRACTUS OCCIDENTALIS.

“Shell elongated, fusiform, rather slender, whitish, traversed by narrow (revolving, brownish threads and much wider intervening spaces; suture distinct, spire tapering; aperture oblong oval, about half the length of the shell; within white, polished; canal short, nearly straight; columellar obliquely, not strongly plicated; length about three-fourths of an inch. Habitat—near the Island of Attou, at the west end of the Aleutian Archipelago.”—Robert E. C. Stearns, Conchological memoranda No. 7 (28 Ag 1871); Ca ac pr 5:—(7 Ap 1873):—“Habitat—near the Island of Nagai, one of the Shumagin Islands, where it was hooked up attached to a rock from a depth of 40 fathoms, by Captain Prime of the California Fishing Fleet; through the kin-

ness of Mr. Harford to whom it was given, it is now in my cabinet."

OCINEBRA CIRCUMTEXTA.

"Shell ovate, solid, sub-turreted, of 5 convex whorls. Upper whorls cancellated; body whorl traversed by about 14 roughly-rounded revolving costae, more or less tuberculated at the intersection of the longitudinal ribs, and marked with fine incremental striae. Last whorl $\frac{3}{4}$ the length of the shell; outer lip thickened internally denticulate, external edge crenulated. Columella excavated, light purple or purplish brown; canal short, open or closed in specimens of equal size. Umbilicus obsolete; surface of whorls with faint irregular longitudinal costae. Color dingy white, with 2 interrupted black or dark brown bands. Lon. .85; Lat. .5 in. Habitat—Monterey, California; Hemphill, Harford, Gordon, and Stearns, 16 specimens, mostly immature."—Robert E. C. Stearns, Conchological memoranda No. 6 (May 18, 1871); "Am J Conch 7:—(1871), with f."

"Not rare under stones at Portuguese Bend," near San Pedro, California, fide Mrs. Williamson (U S Na mu pr 15: 215).

EPIPHRAGMOPHORA CIRCUMCARINATA.

"Helix, variety circumcarinata. Shell widely umbilicated, discoidal, flattened, angulated, with a peripheral keel; whorls 6-6½, slightly tabulated near the sutures, which latter are deeply impressed; surface finely granulated, varying in different specimens; and otherwise sculptured by conspicuous sub-acute ribs parallel with the lines of growth both above and below, which meet, and sometimes cross, the peripheral keel; these ribs are more or less irregular and uneven, of varying prominence, and are also unequally spaced, being closely crowded in some places and farther apart in others. Aperture obliquely subangulate, semilunate; peristome moderately thickened, re-

flected somewhat, covering the open umbilicus, and made continuous by a connecting thin deposit of callus on the labium. Color, in some specimens, dingy white to white, in others a dingy reddish white, ornamented with a double revolving band,—the upper stripe being whitish, the lower reddish or light chestnut just above, and contiguous to the peripheral keel; the pinch or fold of the keel taking up what in *Helix Mormonum* is the third or lower stripe of white. Number of specimens 4, 2 adult and 2 immature, but nearly full grown. Dimensions—Greater diameter .92-1.01; lesser diameter .75-.86; height .36-.37 inch. Animal not observed. Habitat, Stanislaus county, near Turloch, California. For the specimens from which the above is written, I am indebted to Mr. A. W. Crawford, of Oakland, who has examples in his collection; specimens are also contained in the typical collection of my friends Binney and Bland, and in my own museum. Most authors would regard the above as a distinct and well marked species; I regard it (as well as *H. Hillebrandi*, of Newcomb) as a varietal form of *Helix Mormonum*, to which it is a near neighbor, inhabiting the same region.”—Robert E. C. Stearns, *Annals N Y Acad Sci* (N 1879), 3 f.

MONOCEROS PAUCILIRATA.

“Shell moderately elevated, whorls 4-6; body whorl four-fifths the total length, angulated above and excavated between the angle and the suture; a sharp groove behind the tooth. Upper whorls cancellated, nucleus smooth. Aperture elongate, purple brown in the throat; outer lip sharp, yellowish, internally denticulated, with a prominent tooth at its outer edge. Columella purple, canal short, umbilicus nearly covered by the columellar callus. Siphonal fasciole strong. Externally painted with longitudinal broad black and narrow whitish streaks, interrupted by the white dental groove and 3 or 4 narrow yellowish revolving carinae, which, except the keel, are inconspicuously

elevated. Lon. .55; Lat. .33 in. Habitat—Coronado Islands, off San Diego, California. Hemphill, 3 specimens.”—Robert E. C. Stearns, Conchological memoranda No. 6 (May 18, 1871); Am J Conch 7: -(1871), with f.

PLEUROTOMA HEMPHILLII.

“(Drillia) Shell small, smooth, slender, polished; spire long, subacute, rounded at apex; longitudinally marked with inconspicuous, oblique ribs, which are nearly obsolete on the body whorl; number of whorls 7, with well defined sutural line, and just below it a parallel impressed thread-like line; shell of an opaque dingy horn color; incremental lines fine, marked in some specimens with dingy white; mouth obliquely ovate, about one-third the length of the shell; labrum produced, anteriorly somewhat thickened; sinus sutural, deep, calloused; columella thickened at base; canal very short, somewhat produced and twisted; one specimen shows obscure, revolving, impressed lines below the swell of the body whorl; size quite uniform. Lon. .26; Lat. .09 in. Habitat—Los Todos Santos bay, Lower California, where several specimens were obtained by Mr. Hemphill, for whom I have named this well marked species.”—Robert E. C. Stearns, Conchological memoranda No. 7 (28 Ag 1871); Ca ac pr 5—11, f3 (7 Ap 1873).

MURICIDEA SUBANGULATA.

“Shell small, abbreviated fusiform, dingy white and marked spirally by an inconspicuous band formed of 3 reddish-brown lines more or less interrupted on the basal and the preceding volution; whorls 5, angulated above and on the basal whorl rounded below the angle, with a shallow sulcation beneath; surface covered with rounded and irregular costae, which are inconspicuous or obsolete on the upper whorls; longitudinally marked with from 7-9 irregular rounded ribs, which at the edge of the angle, (which is somewhat carinated) are broken into angular or pointed knobs or blunt spines; aperture ovate, angu-

lated above and white within; the outer lip with 5 or 6 tubercles internally; canal moderately prolonged, slightly curved and open in the two specimens before me. Dimensions of largest: Long. .89; lat. .41 inch. Habitat—San Miguel Island, off the southern coast of California, where the specimens from which this description is made were obtained by Mr. W. G. W. Harford."—Robert E. C. Stearns, *Ca ac pr 5*:—t 1, f 4 (7 Ap 1873).

PLEUROTOMA MONTEREYENSIS.

"(Drillia) Shell small, rather solid, elongate, slender; spire elevated, subacute; whorls 7-8 moderately rounded; upper portion of larger volutions somewhat concavely angulated; suture distinct; color, dark purplish brown or black, surface covered with rather coarse, inconspicuous, revolving costae, interrupted on the body whorl by rude incremental lines; middle of upper whorls and upper part of body whorl displaying 14-15 equidistant, longitudinal, nodose, slightly oblique ribs, which are whitish in the specimen before me (being somewhat rubbed on the larger whorls); on the smaller volutions of the spire a puckering at and following the suture suggests a second indistinct series of nodules; aperture less than half the length of the shell; canal short; terminal portion of columella whitish, slightly twisted; posterior sinus, rather broad rounded, and of moderate depth. Mean divergence about 26 degrees, Long. .67 in.; Lat. .24 in. Habitat—Monterey, California, where the single specimen in my cabinet was collected by Mr. Harford and myself in March, 1868. This shell, in its general aspect, resembles the sombre colored specimens of the Gulf of California and Panama."—Robert E. C. Stearns, *Conchological memoranda No. 7* (28 Ag 1871); *Ca ac pr 5*:—t 1 f 2 (7 Ap 1873).

ANCYLUS —————?

Many things in this world are unseen because unsought. While recently camped, one April day, beside the banks of the

San Luis Rey river, remembrances of earlier days beside the waters of a New England river caused the editor to look, rather without hope it is true, for some of his former acquaintances—*Ancylus*—and lo!—a solitary specimen of an apparently undescribed species was the reward. It was a healthy individual attached to a piece of dead wood lodged in the stream and an interesting addition to the fauna of San Diego county and to Southern California. Further search was in vain—possibly it had drifted down from its natural environment nearer the source of the stream. *Succinea oregonensis*, Pupa Hemphilli and *Helix tuliculata* were observed near by.

FUSUS HARFORDII.

“(Chrysodomus?) Shell solid, elongate, regularly fusiform; spire elevated, whorls 6 or 7, moderately convex, slightly flattened (in outline) above, with a groove or channel following the suture; color, chocolate brown; surface marked by numerous narrow revolving costae, which alternate in prominence on the body whorl, and longitudinally by fine incremental striae, and on the upper whorls by obtusely rounded ribs of more or less prominence; aperture ovate, about one-half the length of the shell, polished, white and finely ribbed within; (the outer lip in perfect specimens is probably finely crenulated); canal short, nearly straight. Lon. 2.1; Lat. .94 in. Number of specimens, 3; 2 mature, dead. 1 junior, fresh. Habitat—coast of Mendocino county, near Big Spanish Flat, California, where it was detected by Mr. Harford.”—Robert E. C. Stearns, *Conchological memoranda* No. 7 (28 Ag 1871); *Ca ac pr* 5: 79 (7 Ap 1873). Dall, “*extr Ca ac pr* 19 Mr 1877;” *U S Na mu pr* 14: 178, t 6,

Dall cites the Farallones Islands (Watkins), and says he has “little doubt that this is the shell called by Middendorf *Tritonium Sabini*, from Kenai; at least, there is no other shell of the coast resembling Gray’s *Fusus Sabini*.”

CHLAMYDOCONCHA ORCUTTI.

Dall, Science. 4: 50 (18 J1 1884). U S na mu pr 1885, 549. Or U S na mu pr 1885, 549:—False bay, near San Diego, California, under stones.

Animal somewhat of the shape of a small globose *Cypraea*, of inflated, ovoid form, translucent, jelly-like, dotted above with small, rounded papillae, which appear of an opaque white on the general translucent ground. Over an inch in length when living, contracting in alcohol to less than half. Mantle covering the dome of the body tough and thick; sides smooth, nearly free of the papillae, superior median line a little depressed; basal part of the anterior line in life prolonged beyond the general mass in a trough with the convexity upward, and somewhat expanded at its anterior extremity; about one-third from anterior end the mantle is perforated by an orifice, which pierces it in the vicinity of the mouth. The edges of this orifice project from the general surface, lined with close-set small papillae. At about the same distance from the posterior end is another tubular perforation, holding a similar relation to the anus; which has, however, plain edges, and is not internally papillose. Beneath the anterior surface, lined with close-set small papillae. At about the same distance from the posterior end is another tubular perforation, holding a similar relation to the anus; which has, however, plain edges, and is not internally papillose. Beneath the anterior trough of the mantle prolonged backward, like a slit with plain edges, to about the posterior third; from this projects a narrow, hatchet-shaped foot, with a strongly marked byssus-gland at its posterior angle; from this a bunch of white byssus extends to the stone or object to which this mollusk attaches itself. The cavity of the mantle extends some distance behind the commissure of the pedal opening. The anterior point of the foot is roofed by the trough-like expansion above mentioned. The mouth is provided with 2 pairs of small palpi. Two gills very finely micros-

copically laminate, extend backward from near the mouth, on each side, to the posterior end of the body, the wider one being the inner; between their posterior ends a thin reticularly perforate veil connects the two pairs, and shuts off the anal area from the rest of the mantle cavity. The intestine contains a hyaline stylet, and is considerably convoluted; but the viscera offer no marked peculiarities when compared with ordinary pelecypods. The shells are enclosed in two little sacs in the substance of the mantle. The umbones are near together, apparently connected by a brown gristle resembling an abortive ligament, and are nearly over the heart. The valves are about 10 mm long, 1 wide, destitute of epidermis, prismatic, or pearly layers. There are no muscular or pallial impressions, no adductors, hinge, or teeth. They resemble in form the exterior of *Gervillia*, as figured by Woodward, and are pure white. As they lie in the body, they diverge at a rather wide angle from the beaks forward. The embryonic valves are retained like 2 tiny bubbles on the umbones. The animal forms the type of a new family, *Chlamydoconchae*, and under the classification in the new edition of the *Encyclopaedia Britannica*, would form a new order, *Amyaria*, fide Dall, from whom the above is mainly compiled.



INSECTS OF THE WEST.

The following species have been collected in Riverside and San Diego counties, California, principally on the Colorado desert, and identified by D. W. Coquillett, with the aid of Eastern specialists. Those collected by Dr. Frank E. Blaisdel are indicated by Bl.; by D. W. Coquillett, by Cq.; by Professor Edward Hyatt, by Hy.; all the others by C. R. Orcutt:

HYMENOPTERA.

Sphaerophthalma——. Two species unidentified.
Elias plumipes Drury.

Pepsis formosa Say.

HEMIPTERA.

Tibicen striatipes Haldeman.
Corimelaena extensa Uhler.
Lioderma ligata Stal.
Murgantia histrionica Hahn. Cq.
Eicana apicalis Dallas.
Melanocoryphus bicrucis Say.
Oncopeltus fasciatus Dallas.
Lopidia nigridia Uhler.
Sinea spinipes Herrick Schaefer..
Zaita micantula Stal.
Serphus dilatatus Say.

ORTHOPTERA.

Anisolabia maritima Brn. Cq.
Melanoplus cinereus Scudder.
Melanoplus devastator Scudder.
Trimerotropis vinculata Scudder.
Microcentrum laurifolium L.
Tridactylus apicalis Say. Cq.
Stenopelmaus fasciatus Thomas.

COLEOPTERA.

Cicindela vulgaris Say. Cq.
Cicindela hirticollis Say. Cq.
Cicindela tortuosa Dejean. Cq.
Cyclrus interruptus Menetries. Cq.
Scarites subterraneus Fabricus. Cq.
Brachynus fidelis Leconte.
Galerita lecontei Dejean. Cq.
Enicoderma punctigera Leconte.
Calathus ruficollis Dejean.
Tetragonoderus pallidus Horn.

- Platynus maculicollis* Dejean.
Platynus fossiger Dejean.
Pterostichus protractus Leconte.
Pterostichus vicinus Mannerheim.
Pterostichus isabellae Leconte.
Pterostichus congestus Menetries.
Amara Californica Dejean.
Chlaenius reficauda Chaudoir.
Chlaenius sericeus Foster.
Chlaenius tricolor. Dejean.
Anisodactylus piceus Menetries.
Anisodactylus semipunctatus Leconte.
Anisodactylus californicus Dejean.
Harpalus fallax Leconte.
Bombidium grandicolle Leconte.
Eretes sticticus L.
Deronectes striatellus Leconte.
Cybister explanatus Leconte. Bl.
Thermonectes marmoratus Hope. Bl.
Dytiscus marginicollis Leconte. Bl.
Agabus obliteratus Leconte.
Agabus lugens Leconte.
Ochthebius rectus Leconte. Bl.
Tropisternus limbalis Leconte.
Hydrocombus imbellis Leconte.
Quedius explanatus Leconte.
Nectrophorus pustulata Hersch.
Dermestes marmoratus Say.
Anthrenus scrophulariae L.
Carpophilus pallipennis Say.
Meligethes brassica Scopoli. Cq.
Pha'acrus penicillatus Say.
Hippodamia convergens Guerin.

- Anisosticta seriata* Melsheimer. Bl.
Chilocorus cacti L. Bl.
Dryops productus Leconte.
Dryops suturalis Leconte.
Saprinus pacininosus Leconte.
Saprinus lubricus Leconte.
Diplotaxis subangulata Leconte.
Phobetus comatus Leconte. Hy.
Ligyris gibbosus De Geer.
Buprestis aurulenta L.
Acmacodera decipiens Leconte.
Drasteria livens Leconte.
Podabrus comes Leconte
Telephorus consors Leconte.
Pristoscelis sordidus Leconte.
Pristoscelis quadricollis Leconte.
Amphicerus punctipennis Leconte.
Ergates spiculatus Leconte.
Bruchus limbatus Horn.
Bruchus nigrinus Horn.
Bruchus amicus Horn.
Chrysochus cobaltinus Leconte.
Gastroidea dissimilis Say.
Gastroidea cyanea Melsheimer.
Plagiodera prasinella Leconte.
Luperus maculicollis Leconte.
Disonycha maritima Mannerheim.
Haltica bimarginata Say.
Haltica carinata Germar.
Haltica obolina Leconte.
Edrotes ventricosus Leconte.
Craniotus pubescens Leconte.

Triorophus laevis Leconte.

Stibia ovipennis Horn.

Eurymetopon rufipes Eschscholtz.

Also another, probably new species, of this genus.

Phloeodes diabolicus Leconte.

Centrioptera muricata Leconte.

Nyctoporis carinata Leconte. Cq.

Cryptoglossa verrucosa Leconte.

Asida actiosa Horn.

Asida carinata Leconte.

Asida obsoleta Leconte.

Asida angulata Leconte.

Also another, probably new, species of this genus.

Unsattus difficilis Leconte.

Also another, probably new, species of this genus.

Coniontis subpubescens Leconte.

Eleodes quadricollis Eschscholtz.

Eleodes militaris Horn.

Eleodes armata Leconte.

Eleodes grandicollis Mannerheim.

Eleodes gigantea Mannerheim.

Eleodes consobrina Leconte.

Eulabris pubescens Leconte.

Argoporis bicolor Leconte.

Also another, probably new, species of this genus.

Cerenopus concolor Leconte.

Blapstinus dilatatus Leconte.

Blapstinus pulverulentus Mannerheim.

Notibius puberulus Leconte.

Notibius granulatus Leconte.

Tribolium ferrugineum Fabricius.

Cynaetus depressus Horn. Bl.

Hymenorus confertus Leconte.

Also another, probably new, species of this genus.

Lacconotus pinicola Horn.
Mordella scutellaris Fabricius.
Megetra opaca Horn.
Epicauta puncticollis Mannerheim.
Epicauta strabe Horn.
Cantharis childii Leconte. Cq.
Phodaga alticeps Leconte. Hy.
Eupagoderes decipiens Leconte.
Rhigopsis effracta Leconte.
Sitones sordidus Leconte.
Centrocleonus molitor Leconte. (?)
Dorytomus mucidus Say. Cq.
Phycocactes testaceus Leconte. Cq.
Scyphophorus yuccae Horn.

D. W. Coquillett and C. R. Orcutt.

ABBREVIATIONS.

The editor has adopted the following abbreviations for use in his publications. In citations the number of volume precedes the paging and is separated therefrom by a colon (:); periods are used only at the end of a citation, which is usually composed of a series of abbreviations:

A—America; ac—academy; aes—agricultural experiment station; Am—American; Ap—April; b—bulletin; Ca—California; D—December; F—February; f—figure; J—journal; Ja—January; Je—June; Jl—July; L—Carl von Linnaeus; Mr—March; My—May; mu—museum; N—November; na—national; O—October; Or—Charles Russell Orcutt; pr—proceedings; r—report; S—September; sr—series; tr—transactions; t—plate; Un—university; W—West American Scientist; Z—Zoe.

QUERIES AND ANSWERS.

Questions of general interest will be answered under this department as far as possible; kindly inclose stamped and addressed envelope, when a personal answer is desired. In sending specimens for names subscribers are requested to send at least three specimens of each species, when possible, to number each specimen so that we may report names by number (no specimens will be returned as a rule), and to pay all expenses of transportation. Specimens sent will become the property of the West American Museum.

Q—Have you for sa'e copies of the California botany of Brewer and Watson? H. M. H.

A—No, but can obtain the two volumes, new, for \$12.00.

EDITORIAL.

West America has existed for many years, but prior to the christening of the West American Scientist, we are not aware of its having been so called—western America, west coast, or Pacific slope, being the familiar ways of designation. Perhaps some of our older readers may remember an earlier use of the combination, which we have failed to find—a term now universally adopted. Sixteen years before the public the West American Scientist still continues alone in its field, the only journal of general science published west of the Atlantic sea-board states!

The power of God is unlimited. This is our simple belief. God is Love. Christianity is the embodiment of Love. We believe God will answer prayer, will give us what we ask in faith—but that it is not our place to demand. We need to learn to say: "Thy will be done"—not insist on our own way, regardless of what He deems best. But "Christian Science" is neither science nor Christianity, and the West American Scientist is not one of its organs. Our pages are not open to vain argument

or partisan discussion of either politics or religion; while not closed to any branch of human thought or study, it deems other fields of inquiry pleasanter and more profitable. "Happy is the Man with a hobby," to whom the world owes much of its material progress and pleasure.

NOTES AND NEWS.

KEEP, JOSIAH: Mills College, Alameda County, Cal.

Is engaged on a new edition of his charming book entitled: "West Coast Shells."

AUTHOR'S CATALOG.

COCKERELL, THEODORE DRU ALISON: Mesilla Park, N. M.

—Catalogo de las Abejas de Mexico. 1899, 20 p. 40c

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STEARNS, ROBERT EDWARDS CARTER:

—Verification of the habitat of Conrad's Mytilus bifurcatus, Phila ac pr 1882, 241-2. 10c.

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(6 colored). 1885 \$3.

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VOLUME XI.

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NUMBER 91.

THE

❖ West ❖ American ❖ Scientist ❖

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CONTENTS:

Review of the Cactaceæ of the United States.—V.	57
Queries and Answers.	72
Author's Catalog.	71
West American Mollusca.—III.	63
Editorial.	70
Notes and News.	70

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THE West American Scientist

Volume XI. No. 6.

July, 1900.

Whole No. 91.

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, $1\frac{1}{2}$ 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 $1\frac{1}{4}$ 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 satisformes cauducos gerentibus; floris purpurei ovario obovato pulvillis plurimis instructo; stigmatibus 8 in capitulum congestis; bacca obovata late umbilicus (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 $2\frac{1}{2}$ 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 $1\frac{1}{2}$ -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 $1\frac{1}{2}$ 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 $\frac{1}{4}$ - $\frac{3}{8}$ 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 flavis 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 $\frac{1}{4}$ 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.

"Caule dense lignoso ramosissimo divaricato; articulis junioribus erectis elongatis basi attenuatis; tuberculis oblongo-linearibus; aculeis inferioribus 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.

"Glaucis; radicibus no. loto-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 1½-3 inches long, 1-2 wide; pulvilli 4-6 lines apart; lower spines 1-2 inches long. Flower 2½ 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, 1-1½ inches in diameter; tubercles 1-1½ inches long; longest spines 1½-2½ inches long, ¼-1 line wide; the exterior spines gradually smaller, and less angular. Fruit 2-2½ inches long, partly armed with spines 4-8 lines long. Seeds from 2¼-3¼ 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, ½ 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.

WEST AMERICAN MOLLUSCA.—III.

The first part of the proceedings of the academy of natural sciences of Philadelphia for 1900 contains the following articles pertaining to our subject:—

Dall, William Healey: Additions to the insular land-shell faunas of the Pacific coast, especially of the Galapagos and Cocos Islands. 88-106, t 8.

Pilsbry, Henry A.: Addendum to Dr. Dall's paper: note on the anatomy of *Guppya hopkinsi* Dall. 105.

—Note on the anatomy of the helicoid genus *Ashmunella*. 107-109, 3f.

—Mollusca of the Great Smoky mountains. 110-150.

The following descriptions are of new species, taken from Dr. Dall's paper:—

EPIPIRAGMOPHORA LEUCANTHEA.

“Shell with $5\frac{1}{2}$ rather convex whorls; pale lavender, nearly white below, with an obsolete white peripheral band, above which the whorl is more or less tinged with pale bluish gray, a translucent band above the peripheral one through which the dark brown with which the interior of the whorls is lined may show through more or less distinctly; nuclear whorls with wavy radial striæ, visible under a lens, for a whorl and a half, translucent; succeeding whorls opaque, except as stated, polished, with rather distinct incremental lines and obsolete vermiculations or malleations; base rounded, perforate, with the umbilicus nearly closed by the columellar reflection; aperture rounded, the outer lip slightly reflected, white, with the throat brown internally; body without callus, pillar short, arcuate, with no thickening or denticle upon it. Major diam. 28, minor 23.5, alt. of shell 20, of aperture 15 mm.

Eastern side of Cerros Island, Anthony, 1896.

“This is evidently a derivative from *E. Veatchii*, from which it differs in the absence of the numerous interrupted brown bands, in the usually blunter and lower spire and more distinct and deeper sutures.”—Dall, 99, t 8, f 18, 20.

E. CRASSULA.

“Shell small, solid and heavy, smooth, with 5 whorls; spire rather pointed, suture distinct, not deep, last whorl evenly round-

ed at the periphery; color opaque white with more or less numerous very pale brown subtranslucent spiral bands, all or part of which may be absent; usually there is a peripheral white band and between it and the suture one or two translucent bands of which the anterior is most constant; from 2-4 narrower translucent bands may exist in front of the periphery; the base is rounded, at first minutely perforate, later imperforate and sealed by a reflection of the pillar lip; aperture rounded, slightly oblique, with a solid white, slightly reflected peristome, but no callus on the body; pillar broad, short with a conspicuous callosity. Alt. of shell 15, of aperture 6, lat. of shell 15.5, of aperture 7.5 mm.

"Natividad Island, 10 miles south of Cerros Island, Anthony, 1896

"This species is an offshoot of *E. levis* Pfr., from which it differs by its smaller, and much heavier shell, fewer whorls conspicuous peristome and narrower, fewer and less interrupted banding of a paler tint."—Dall, 100, t 8, f 3.

E. (MICRARIONTA) GUADELUPIANA.

"Shell small, thin, depressed, of a dark-brownish color with a narrow reddish band, bordered on each side by a pale streak, just above the periphery; spire little elevated, suture distinct; epidermis strong, in well-developed specimens slightly microscopically hirsute; sculpture of well-marked incremental lines, stronger on the spire, with occasional microscopic punctations; base more or less flattened, the last whorl with the periphery somewhat above the middle of the whorl, umbilicus narrow and deep; aperture sub-circular, very oblique with a strong whitish reflection of the peristome, the ends of the lip on the body approximated, throat with the bands showing through. Alt. of shell 6, diam. 10.5, aperture diam. 4.5 mm.

"Guadalupe Island, off Lower California, in N. Lat. about 29 degrees, Anthony, 1896; Snodgrass and Heller, 1899.

"This very well-marked little species is nearest to *E. Catalinae*, but is well depressed, with a larger umbilicus and differently shaped aperture. It seems to be tolerably abundant, though most of the specimens received were defective."—Dall 101, t 8, f 14, 15.

E. CATALINÆ.

“*Helix tenuistriata*’ W. G. Binney (as mutation of *H. Gabbi*), Land and fresh-water shells of North America, part 1, page 175, f 305, 1869; not of A. Binney, 1842.

“*Arionta Gabbi*, W. G. Binney, U S Na mu b No. 28, 148, f 130, 1885.

“This form was collected on Catalina Island by H. Hemphill, and, while obviously a member of the *Gabbi-facta* group, seems perfectly distinguishable from the other members of that group. There is a very large series of *Gabbi* and *facta* in the collection of the National Museum, and, notwithstanding their variability I do not find any specimens which are not readily referred to one or the other, and none intermediate between these and *catalinæ*. The name *tenuistriata* had previously been used specifically by A. Binney, and was repudiated for this shell by his son. As the original *tenuistriata* A. Binney has never been identified, and in the case of the present species the name would have to rest anonymous, it seems better to apply a local name to it which is free from any uncertainty. It has a small deep umbilicus partly shaded by the reflected pillar lip and a broadly reflected peristome, the ends of which upon the body are not approximated. It measures as follows: Alt. of shell 7, diam. 12, diam. aperture 4.5 mm. There are $5\frac{1}{2}$ rounded whorls and the entire shell is finely spirally striate. It is also found fossil on Santa Barbara Island, but the fossil specimens are often considerably larger than the largest living specimens now known; one measures 15 mm. in major diameter and nearly 10 mm. in height.”—Dall, 103.

E. ORCUTTI.

“Shell globose, moderately elevated, polished, with nearly 6 moderately convex whorls forming a dome-like spire; color purplish brown, lighter toward the umbilicus; a narrow pale band on the last whorl bordered behind by a darker brown, poorly defined, similar band, both being above the periphery and the suture in the earlier whorls being laid on the anterior edge of the darker line; nucleus flexuously radiantly wrinkled, pale colored; subsequent whorls with fine incremental wrinkles the ridges of which are cut by revolving, partly obsolete incised lines; as a rule these lines are not deep or continuous, cutting merely the tops of the wrinkles and not the furrows between them; suture distinct, last whole rounded, plump, toward the aperture descending below the pale band; base plumply rounded, the umbilicus covered by a reflection of the pillar-lip with a minute chink behind it; aperture very oblique, thickened, whitish, reflected, especially near the pillar;

throat livid brownish with the bands well indicated. Major diam. of large and small specimens, respectively, 24 and 22.5, minor diam. 20 and 18.5, alt. 19 and 16 mm.

"Habitat: Rosario mesas, in Northern Lower California, in May, 1886, by C. R. Orcutt.

"This form much resembles in shape the typical *E. Kelletii*, from which it differs in the absence of the yellow flecking and the different surface sculpture. *E. Kelletii* is also a more globose shell. The same stock, doubtless, was the origin of both species, as well as several others."—Dall, 104-105, t 8, f 19.

Under living and dead Maguey plants (*Agave shawii*), with *levis* and *Stearnsiana*, exceeding rare in comparison. Major diam. of largest specimen obtained 27, minor 22, alt. 19 mm. This is from the type locality of *Stearnsiana*, which was much more abundant and differing not at all from San Diego specimens. Orcutt No. 1321. It has more the aspect of the *tudiculata* than the *Kelletii* group. One specimen was quite elevated, 24 mm alt.

E. STEARNSIANA.

Under *Helix*.—"Shell narrowly unilobated; sub-globose, solid, of a dirty white color, irregularly mottled with crowded ashy blotches, grouped into revolving series below, with a decided wide, brownish revolving band above; with delicate oblique incremental striae, unequally cut by revolving lines; spire elevated; whorls 5, rather convex; aperture oblique, semi-circular; peristome simple, acute, its columellar termination white, expanded, reflected over the half concealed umbilicus. Greater diam. 22, lesser 17; height 12 mill.

"*Helix stearnsiana* Gabb, Am J Conch 3: 235, t 16, f 1 (1867).

"Lower California, from Sta. Tomas to Rosario, under stumps of Maguey. (Gabb.) The shell figured and described was received from Dr. Newcomb. It may not be entirely mature."—B-B, 177, f 310.

"San Martin Island, in N. Lat. 30 degrees, 30 minutes, Anthony, 1896."—Dall Phila ac pr 1900, 101.

EPIPHRAGMOPHORA KELLETTI.

Under *Helix*.—"Shell narrowly umbilicated, depressed-globose, thin, wrinkled, granulated, fulvous; spire subtruncated, with dirty reddish blotches and one red revolving band; whorls 6, rather convex, the last with a white band at its periphery, and inflated on its under surface; aperture roundly lunate, light red and banded within; peristome somewhat reflected, its columellar portion dilated, reflected, covering the umbilicus. Greater diam. 22, lesser 19; height 19 mill. (Forbes.)"—B-B 176, f 30a.

"*Helix kellestii*" Forbes PZS 1850 55 t 9 f 2, a, b.

"*Epiphragmophora (Micrarionta) kellesti* Pilsbry Cat land shells of Am north of Mexico 6, 1897.

"The measurements of the type are major diam. 22, minor diam. 19, alt. 19 mm. No locality is mentioned."—Dall Phila ac pr 1900, 103.

V. ? *Clementina*.—"Shell small, thin, pale translucent brownish in color with obscure revolving series of very minute yellow or whitish flecks; whorls 4, the nucleus wrinkled transversely, reddish, slightly flattened, the succeeding whorls rather convex with a distinct suture; a very narrow dark reddish-brown band, with a hardly visible pale border in front of it, revolves above the periphery; sculpture of rather well-marked incremental rugae, cut on the upper part of the last whorl by microscopic spiral striation, to which is added a partly obsolete oblique striation which is visible, under magnification, chiefly in patches; the effect of the whole is to give the surface a very fine shagration; the last whorl near the aperture descends strongly and the plane of the aperture forms an angle of about 45 degrees with the axis of the shell; base full and rounded, the umbilicus completely covered by a reflection of the pillar lip; aperture rounded, the peristome narrow, whitish, slightly thickened and reflected. Major diam. 15, minor diam. 12, alt. 11 mm.; other specimens are slightly larger. Habitat: San Clemente Island, Cal., U. S. Fish Com."—Dall Phila ac pr 1900, 103-104.

E. LEVIS.

Under *Helix*.—"Shell perforate, globose, thin, smooth, obliquely striate, obsoletely granulated, white, varied with regular

series of spots or bands of horn-color; spire short, rather acute; whorls 5, scarcely convex, the last inflated; aperture roundly lunar, within somewhat yellow; peristome acute, somewhat thickened within, its columellar portion dilated above, arched and reflected, almost covering the perforation. Greater diam. 16, lesser 14; height 13 mill.

"Var. b. The columellar portion of the peristome with a single obtuse, tooth-like callosity.

"*Helix levis*, Pfeiffer *Mon Hel Viv* 1:54; 3:128; *Zeits f Mal* 1845, 2:152; in *Chemnitz ed* 2, 1:249, t 36 f 16, 17 (1846).—Reeve *Con Icon* 1214.—W. G. Binney *Terr Moll.* 4:18 t 76 f 10.

"*Polymita levis*, Tryon, *Am V Conch* 2:320 t 5 f 21? (1866).

"Columbia River. Dr. Newcomb doubts its being a Californian or Oregon species."—B 180 f 316. Figure is marked "var."

"Rosalia bay, mainland of Lower California, in N. lat. 28 degrees, 30 mm., Anthony 1896. Erroneously referred to the Columbia river by Pfeiffer."—Dall *Phila ac pr* 1900, 100.

E. AREOLATA

Under *Helix*.—"Shell perforated, orbicularly conoid, striated, shining, white, variously ornamented with revolving interrupted reddish lines; spire depressed-conoid; whorls five, rather convex, the last scarcely descending, somewhat convex at base; aperture roundly lunar, smoky within; peristome acute, somewhat thickened within, its columellar portion shortly arched, dilated, reflected, with one tooth-like callosity (sometimes wanting), and almost covering the umbilicus. Greater diam. 26, lesser 23; height 18 mm.

"*Helix areolata*, Sowerby, *Brit. Mus.*—Pfeiffer in *Zeitschr f Mal* 1845, 2:154; *Mon Hel Viv* 1:152; in *Chemnitz ed* 2, 1:248, t 36 f 10-13.—Philippi, *Icon* 2, 15, 184, t 9 f 4 (1847).—Gould, *Terr Moll* 3:15.—W. G. Binney *Terr Moll* 4:19 t 76 f 3, 11.—Reeve, *Con Icon* 664.

"*Polymita areolata*, Tryon *Am J Conch* 2:319, t 23 (6) f 5 (1866).

"*Arionta veitchii*, Tryon, *Am J Conch* 2:316 t 5 f 19 (1866).

"The specimens figured are from Cerros Island, California.

The species is also quoted from Oregon, and is referred by Newcomb to Margarita Bay."—B-B 177-178, f 311.

Margarita bay, Lower California, Newcomb; Natividad Island, Anthony, 1896. Mistakenly referred to Oregon by Tryon.

"Though doubtless similar in origin and in coloration, *areolata* is smaller than *Veatchii* and has a more depressed spire, and on the whole is easily separable from the latter if a good series is compared."—Dall Phila ac pr 1900, 100.

The 4 f in B-B f 311 represent *levis* in the 2 outer and *Veatchii* in the 2 inner f.

F. PANDORÆ.

Under *Helix*.—"Shell imperforate, globose-conic, rather solid, reddish above, violet on the apex, ashy below, bound with numerous, interrupted, light blotches and lines; whorls five, rounded; suture impressed; aperture subcircular; peristome narrowly reflected, white, its ends approaching; throat bluish; columella thickened, rounded. Greater diameter 17, lesser 16; height 14 mm.

"*Helix pandoræ*, Forbes, Zool soc pr 1850, 55 t 9 f 3 a, b.—Con Icon 671.—Pfeiffer Mon Hel Viv 3:127; in Chemnitz ed 2, 3:467 t 156 f 17, 18 (1853).—Gould Terr Moll 3:15.—W G Binney Terr Moll 4:18 t 76 f 8.

"*Helix damascenus*, Gould, Boston Soc Nat Hist pr 6:11 (O 1856).

"*Polymita pandoræ*, Tryon, Am J Conch 2:320 t 6 f 8 (1866).

"Margarita Bay, Lower California. The specimen figured wants the characteristic revolving lines and blotches."—B-B 179-180 f 315.

Stearns in N Y ac annals 2:136 says he regards "*H. areolata*, *pandoræ*, *Veatchii* and *levis* as varieties of a single species."

EDITORIAL.

A certain "institute of science" advertises in various mediums, otherwise usually respectable, like the *Scientific American*, offering to send free a book on the wonders of personal magnetism and hypnotism. The book, accompanied by numerous circulars and testimonials, was duly received upon application. It contains much that is true; quotes many eminent men, like Presidents Jordan, Eliot, and others, no doubt correctly; and some startling claims are put forward of the certainties in the reach of any one sending \$5 for their wonderful secrets ("former price \$25.00—reduced for a short time only," as I recollect the circular's wording.) Skillful dovetailing of truth with falsehood is often effectual in parting the fool and his money, but until this remarkably "liberal" institute accedes to the editor's proposal for the testing of the alleged discoveries and methods, we would advise our readers to be cautious. The wonders of nature are yet beyond the comprehension of the human mind, and some truth is at the foundation of all great popular error, but only the student—the specialist we might say, can unerringly detect the true diamond among false stones, or winnow the wheat from the chaff.

"Manifest destiny" seems to point to national expansion. With the East Indies and the West Indies and the open door to China commerce must advance. There are too many millions of idle capital in the United States to neglect the opening vista. Money rules; monopoly has seized the saloons of Manilla and may soon grasp the Opium trade of the Orient; gigantic trusts are fast throttling individual effort at home; the horizon looks dark to many—but there is a glorious dawn beyond.

 NOTES AND NEWS.

It should be noted that *Epiphragmophora Harperi* was named in honor of Prof. George W. Harper, for nearly half a century devoted to educational work in Cincinnati, and until lately principal of Woodward High School—having resigned that position to devote his time more fully to scientific research; geology and conchology are his specialties.

Epiphragmophora Bowersi was named in honor of Dr. Stephen A. Bowers, a veteran in scientific and other good work on the Pacific coast, now state mine examiner for California.

AUTHOR'S CATALOG.

- BAMFORD, MRS. C. E.: Silk culture. 1886. 32p. 20c.
- BOMMER, GEORGE.: The Bommer method of making manure. 90 p. 30c.
- BRYANT, WALTER E.: Additions to the ornithology of Guadalupe Island, 40 p. \$1.00.
- BUCKLEY, ARABELLA B.: Fairy land of science. 304 p. Ill. 30c.
- CALIFORNIA FRUIT GROWERS' CONVENTION: R 9, 10, 11, each \$1.
- CALIFORNIA, Geological survey of: Vol. 1, Geology, 1865. 2d hand copy, \$10.
- CALIFORNIA state board of horticulture: B 50, 60, each 25c.
- CALIFORNIA viticultural commissioners: R 1, 7, each \$1.
- CASEY, THOMAS L.: Descriptive notices of North American coleoptera. 111 p. 1 pl. \$2.
- CHAPIN, O. S.: Manual of orchard planting. 1887. 8 p. 5c.
- CRAW, ALEXANDER: Destructive insects. 1891. 51 p. Ill. 25c.
- EMMONS, SAMUEL FRANKLIN: Geographical and mining industry of Leadville, Colo. 770 p. 45 pl. 1886. No atlas. (New \$8.40). \$4.
- Flax culture. Manual of. 56 p. Ill. 35c.
- GARCELON, G. W.: Fifteen years with the lemon. 1891. 17 p. Ill. 25c.
- GOOD, PETER P.: The family flora and materia medica botanica. A new ed revised and enlarged. Cambridge, Mass. "Over 400 pages, large octavo." 48 colored plates. Volume 1 is said to have been all that was issued. \$4. (First ed published at Elizabethtown, N. J., 1847).
- GREENE, EDWARD LEE: Some genera which have been confused under the name Brodiaea. 40c.
- HARASZTHY, ARPAD: California grapes and wine. 1883. 25c.

- HENSHAW, HENRY W.: Perforated stones from California. 1887. 34 p. 16 f. \$1.
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- HUGHES, E. GRIFFITHS: The tree oil; an insecticide for plants and animals. 37p. 25c.
- IOWA, Geology of: 1870. White. 2 vo's. \$4.
- KANSAS planters, Notes on conifers for. Kans aes b 10. 30c.
- LELONG, B. M.: Cal. prune industry. 1892. 33p. Ill. 25c.
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- NESFIELD, DAVID W. C.: The vine land of the west. 1883. 25c.
- PAULET, JEAN JAQUES: Iconographie des Champignons. 217 pl. Text by J.H. Levielle. 135 p. 1855. With portrait of Paulet, \$100.00.
- Rats and other pests. how to rid buildings and farms of. 32 p. 20c
- SILK CULTURE: Instruction book in the art of. 1882. 144 p. Ill. 50c.

QUERIES AND ANSWERS.

Questions of general interest will be answered under this department as far as possible; kindly inclose stamped and addressed envelope, when a personal answer is desired. In sending specimens for names subscribers are requested to send at least three specimens of each species, when possible, to number each specimen so that we may report names by number (no specimens will be returned as a rule), and to pay all expenses of transportation. Specimens sent will become the property of the West American Museum.

Q—Have you for sale copies of the California botany of Brewer and Watson? H. M. H.

A—No, but can obtain the two volumes, new, for \$12.00.

THE
West American Scientist

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August, 1900.

Whole No. 92.

SEA-URCHINS OF THE PACIFIC COAST.

These beautiful animals seem to have received slight attention, as the following is about all the information that I find.

I—Regular sea-urchins.

ARBACIA NIGRA, credited to west coast.

A. STELLATA Gray, collected at San Juan, in the Gulf of California, by the writer, No. 1772 (1899).

ASTROPYGA PULVINATA, credited to Lower California and Central America, described as having flesh-colored spines.

DIADEMA MEXICANUS A. Ag. San Diego, south.

HIPPONOE DEPRESSA, San Diego, Gulf of Cal.

STRONGYLOCENTROTUS FRANCISCANUS occurs at San Diego, south; often a foot in diameter, including spines.

S. MEXICANUS of the Gulf of California I have not seen.

S. PURPURASCENS is the common San Diego purple urchin.

II—Cake-urchins.

CLYPEASTER ROTUNDAS, San Diego, south.

ECHINARACHNIUS EXCENTRICUS Val.

This common species is abundant from Oregon to Mexico; a form from Santo Domingo, Lower California (Orcutt No. 2552) is quite different from the 'sand dollars' of San Diego, and we are inclined to consider it distinct.

ENCOPE CALIFORNICA Verrill.

Orcutt No. 2551: Santo Domingo, Lower California.

E. GRANDIS, Gulf of California.

III—Irregular sea-urchins.

AGASSIZIA SCROBICULATA, western Mexico.

BRISSUS OBESUS Verrill. Gulf of Cal.—Orcutt.

LOYENIA CORDIFORMIS, Pt. Conception to Mexico.

RHYNCOPYGUS PACIFICUS, western Mexico.

We will be pleased to learn of any additions that can be made to this short list.

C. R. ORCUTT.

WEST AMERICAN MOLLUSCA.—IV.

SHELLS OF LAGOON HEAD.

The following list is the result of two or three days spent in the latter part of February, 1899, mostly spent in botanizing. No rocky beach was visited, all the living shells being collected in the lagoon, nearly due east of Cedrus Island, the landing being known locally as Santo Domingo. It is near the 28th degree north lat. on the west coast of Baja California, a few miles north of Scammons lagoon. Species not found living are marked d.

The letter e indicates species observed in the kitchen middens or shell heaps on the sand dunes near the lagoon, probably of Indian origin—but possibly in part of more recent origin; species marked ee were probably collected attached to other shells and not sought for food; *Pinna* and *Avicula* were doubtless sought by pearl fishers.

In one of these heaps was found a stone cylinder, perforated, undoubtedly of Indian origin, which was sent to the American museum of natural history, with several thousand other specimens on approval in exchange for books—which they now refuse to send and likewise refuse to return the specimens—compelling us to make a forced donation, a species of wholesale robbery, founded originally we suspect on a misunderstanding, but so far the museum officers concerned have shown no trace of honor.

Purpura biserialis Blainv.

Found living a few miles north of San Diego was seen only in beach worn specimens; observed abundant at San Juan and other points in the Gulf of California.

Chorus belcheri Hinds. d

Ranella californica Hinds. d abundant.

Macron æthiops Reeve. Not rare. e

Nassa tegula Reeve. Abundant.

Myurella simplex Cpr. Not rare.

Drillia—? d ee

Conus californicus Hinds. d ee

Cypræa spadicea Gray.

Several fine examples were collected by the pearl fishers who were in the lagoon at the time of my visit.

Neverita reclusiana Reeve.

Apparently as abundant as formerly in San Diego bay. e

- Polynices* nber Valenciennes. One living specimen found.
Crucibulum spinosum Sowerby. Abundant. ee
C. imbricatum Lam. Orcutt No. 1751. d ee
Crepidula unguiformis Lamarck. One collected.
C. dorsata Brod. Found on shells collected by the pearl divers.
C. rugosa Nuttall. Abundant. ee
Litorina scutulata Gould. Abundant.
L. planaxis Nuttall. d rare.
Cerithidea sacrata Gould. ? d rare.
Barleeia subtenuis Cpr. Extremely abundant on sea-grass.
Truncatella californica Pfeiffer. Not rare.
T. stimpsoni Stearns. Very common.
Pomaulax undosus Wood. d e common.
Omphalius anreotinctus Forbes. One seen, d.
Haliotis cracherodii Leach.
 To the north of Lagoon Head, at 'Santa Rosalia,' on the west coast, hundred of sacks of this species were loaded on the steamer during my trip. e
H. splendens Reeve
 The pearl fishers had only two or three.
H. corrugata Gray.
 The pearl fishers had collected about two dozen fine typical shells of this species.
Fisurella volcano Reeve. d
F. violacea, one specimen, d.
Lucapina crenulata Sowerby. e
Acmaea patina Esch. Rare.
A. spectrum Nuttall. Few small ones seen.
Lottia gigantea Gray. e common.
Cylichna inculta Gould. d
Bulla nebulosa Gould. Not rare.
Haminea vesiculata Gould. Abundant.
H. virescens Sowerby. d abundant.
Melampus olivaceus Carpenter. d ee abundant.
Pedipes unisulcata Carpenter. Abundant.
Zirphoceraspata L. d
Pholis—? d
Solen rosaceus Gould. Beautiful and large, 2½ inches long.
Tagelus californianus Conrad. Abundant.

- Cryptomya californica* Conr. d
Clidiphora punctata Gabb. d one specimen.
Semele decisa Conr. d
Lyonsia californica Conr. d common.
Periploma argentaria Conr. d
Sanguinolaria ruttallii Conr. A fine series obtained.
Tellina rubescens Hanl. One fine specimen obtained.
T. variogata Cpr. d not rare.
Heterodonux bimaculatus D'Orb. d common.
Macoma indentata Cpr. Abundant.
Donax californicus Conr. d common.
D. flexuosus Gould. Few fine ones obtained.
Venus fluctifraga Sowerby. One distorted specimen. e
V. succincta Val. Large and abundant. e
Tivela crassatelloides Conr. d not abundant?
T. radiata Sowerby. Not common?
Amiantis callosa Conr. Abundant. d
Cytherea chionæa Mke. e edible, not abundant.
Tapes staminea Conr. d
Cardium procerum Sby.
Liocardium elatum Sby.
L. substriatum Conr.
Chama exogyra Conr. d
Arca multicosata Sby. e not rare, edible.
Mytilus californianus Conr. d e
Modiola capax Conr. d
Septifer bifurcatus Reeve.
Pinna lanceolata Sby. d e
Avicula peruviana Reeve. Found abundant by pearl fishers. e
Pecten subnodosus Sby. d e
P. monotimeris Conr. d rare.
P. æquisulcatus Conr. e extremely abundant.
Anomia lampe Gray.
 Thousands of fine specimens were found, attached to each other, or to other shells, bits of wreckage, etc. Found also at Guaymas, in the Gulf.
Ostrea lurida Cpr. ee common.
Labiosa (Ræta) undulata Gould. d
Dosinia ponderosa Gray. e edible, common.
 To be concluded.

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MEDICINAL PLANTS.

In the Mission days of California, the Jesuite and Franciscan fathers and the early settlers found it necessary to rely upon their own resources and to become proficient in many trades and professions which in a more advanced stage of civilization are relegated to specialists. Medicine and surgery were sciences which naturally demanded the attention of every one, especially of the fathers who were virtually entrusted with both the spiritual and physical welfare of these primitive communities. At times, doubtless their limited stock of simple remedies ran low, and with the slow means of communication with other communities, and with Mexico and Spain, whence they drew their earlier supplies, they gladly availed themselves of the traditional knowledge of the virtues of native plants which obtained among the Indian population around them.

Among the Californian aborigines, as among most tribes of Indians, there existed so-called medicine men or doctors, who, by practicing on the superstitions of their fellows, and with the aid of their traditional knowledge of the virtues of certain plants—handed down from generation to generation of medicine men—followed with greater or less success the healing art.

Local remedies, however, are known and used every where in all climes and

among all conditions of people, and unquestionably the simple formulae, comprised of harmless vegetable ingredients, as practiced among a normally healthful rural community, are more successful in the average cases, than the complicated combinations of poisons administered by the old school physician.

Rhamnus purshiana DC.—Among the native remedial agents most extensively employed in California is this species, which is found only in limited quantity in Southern California. Prof. H. C. Ford records it from the Santa Ynez mountains, and Mrs. R. F. Bingham notes it among the "Medicinal plants growing wild in Santa Barbara and vicinity" (vide Bull. S. B. Soc. Nat. Hist., i. 2, pp. 30-34). Dr. H. H. Rusby (Druggists' Bull. IV. 334), calls attention to the difficulty of positively identifying and distinguishing this species from its near relative, *R. californica*, in its southern habitat, where the two are usually associated together and recommends that this important drug, *Cascara Sagrada* as it is called, should be collected only in northern California or Oregon to avoid all risks of obtaining spurious bark.

Rhamnus tomentella Bth. — This shrub or small tree, evidently restricted in its distribution to the mountains of San Bernardino (Parish) and San Diego counties and of northern Baja California, is popularly known as the wild coffee bush, or Yerba loco. Dr. Rusby does not consider this to possess any useful properties—at least no virtues worthy of comparison with *R. Purshiana*. Its large black berries are sweet to the taste, but poisonous or at least unwholesome, as children sometimes find to their cost. The seeds are

somewhat of the size and shape of coffee berries—whence the common name—and when separated from the pulp and roasted are said to form a fair substitute for coffee, though I should prefer not to experiment with it myself.

The bark of this species is popularly considered efficacious in severe cases of dysentery, and the leaves to possess cathartic properties—though both are conceded to be dangerous remedies. The receipt given me for dysentery is to take one pound of the bark of the root, boil in a quart of water until reduced to a pint.

Daucus Pusillus Michx.—Mrs. R. F. Bingham (S. B. Soc. Nat. Hist., C. 1:2-35) states that this is "very much valued by the natives as a remedy for the bite of the rattlesnake." She cites "one of our oldest physicians" as having "seen a Californian chew the plant, moisten his arm with the saliva, and then permit a rattlesnake to bite his arm, without producing swelling or any bad effect." She says the plant is usually applied in the form of a poultice. It is widely distributed from British Columbia to Mexico and eastward to the Atlantic, but I have not personally known of its use above stated, the "Golondrina" (a species of *Euphorbia*) possessing the same desirable reputation throughout the section where I have collected.

Paeonia Californica Nutt.—The root of the "Pionia" is considered valuable by the natives for the healing of sores on man or beast.

Aplopappus Palmeri Gray.—The "Pasmore" of the Mexicans and Indians is reputed to be invaluable in cases of lockjaw.

Mimulus glutinosus Wendl.—The infusion of the leaves of this and related forms (treated as species of *Diplacus* by some botanists) is considered a specific by some for dysentery.

Asclepias Subulata Decne.—"Jumete" is a very powerful cathartic, equal in activity to croton oil. The Indians are said to use it in cases of syphilis after all other remedies fail to bring relief; an overdose often resulting in incurable insanity or death. In Mexico the juice of this or a similar plant is said to be often used in cases of enmity, the

victim of the insidious drug becoming insane for life if not mercifully relieved at once by death. Tradition says that Maximilian's unfortunate empress, Carlotta, was a victim of this drug, but the truth of this may never be known.

Asclepias Albicans Watson.—A larger species of jumete, from the Colorado desert and adjacent regions in Baja California, is credited popularly with the same powerful cathartic properties as the last.

Solidago Californica Nuttall.—The Golden Rod, or "Oroja de Leabra" of the Mexicans, is prized above all other herbs for its curative properties in cases of either internal or external injuries of man or beast, the most stubborn of sores being said to quickly heal under its influence.

Loesella tenuifolia Gray.—This herb is credited with valuable medicinal properties, being held in high repute by Indians and Mexicans for fevers and in other diseases. Some Mexicans once informed me however, according to my field notes, that it is a virulent poison 'used only in venereal diseases.' Without some actual knowledge of the properties of a plant it should be experimented upon with exceedingly caution.

Helenium puberulum DC.—This plant is common along water courses from San Francisco southward to Santo Tomas, Baja California. Bancroft says this plant is used by the Indians in the same way as we make use of sarsaparilla. Mrs. Bingham (l. c.) says it is "used as a tonic and antiscorbutic, and also in the form of a powder for catarrh." She gives the vernacular name as sneezewood. It is known to the Mexicans as rosea or rosilla (the proper spelling of the word) who inform me that the seed is the part mainly used medicinally.

Matricaria discolor DC.—"Used for bowel complaints" (Mrs. Bingham). "Said to be used in California as a domestic remedy for agues and bowel complaints" (Watson, Bot. Cal. i. 401.)

Datisca glomerata Benth. & Hook.—"The root is a bitter tonic known as Durango root" (Mrs. Bingham).

Artemisia ludoviciana Nutt.—Mrs. Bingham says this is "recommended

for the effects of poison oak."

Lonicera subspicata Hook & Arm.—The "moronel" of the Mexicans is used by them in the form of a tea as a blood purifier; the plant is also used for the healing of sores.

Grindelia robusta Nuttall.—This is a popular remedy, especially recommended as a remedy for the effects of the poison oak (*Rhus diversiloba* Torr. & Gray), the plant being applied fresh, or a decoction or alcoholic infusion used (Mrs. Bingham). The crude drug sells at about \$5.00 per hundred pounds. A Russian scientist is at present engaged in a study of the medicinal properties of this plant and of the other species of the genus—most of which seem to possess the same valuable properties and some of which are doubtless often substituted for or confused with the typical *G. robusta* of Nuttall. One of these, *G. subsquarrosa*, I have recently supplied to an eastern firm, sending them about fifty pounds of the crude drug, for them to thoroughly test its properties.

Romneya coulteri Harv.—"A deadly poison." "The whole plant is used, bruised and boiled and applied as a poultice or taken in liquor"—my notes do not state whereof its virtue consists. It will naturally be inferred, however, that its properties are similar to those of opium.

Ephedra californica Watson.—"Canatilla" or Mountain tea, and "tepopote" (fide Havard), are names applied to several of the genus *Ephedra*. "They are popular remedies among Mexicans and frontiersmen in the treatment of syphilis and gonorrhoea, especially the latter. The decoction or infusion of the stems has an acid reaction and an astringent taste resembling that of tannin. It is used as an injection and internally; some caution should be observed as it has been known to cause strangury." (Dr. V. Havard, vide Proc. U. S. Nat. Mus. VIII. 504.) The species Dr. Havard refers to are *E. antispyllitica* C. A. Meyer and *E. trifurca* Torrey, but the same remarks seem to apply equally well to our Californian species. It is often used as a substitute for tea, and is scarcely distinguishable in taste, except for an after-flavor, not unpleasant, reminding one slightly of catnip tea. It is in

great renown as a blood purifier and many have volunteered to me their opinion that it was "better than sarsaparilla" and without an equal. I have never heard of unpleasant effects following its use. It is a valuable sedative. Experiments and analyses prove it to be not superior to *E. antispyllitica*—which already has a place among American drugs.

Baccharis glutinosa Pers.—This, or another species of the genus, familiarly known as Mock willow, is held in some repute for the healing of sores. *Pluchea borealis* Gray, also known by the same popular name, perhaps shares in the same virtues and is, I believe, the plant known to the Mexicans as "water-motor"—credited with medicinal virtues without number!

Cucurbita Palmata Watson.—The rock orange and wild pomegranate are names frequently applied to this and other species of the genus *cucurbita*. The root is very bitter, and a strong and quick emetic, acting "without any disagreeable effect on the nerves." In common with the following species this is known to the Mexicans as "Chili Coyote," or "Calabazilla."

Cucurbita Foetidissima, H. B. K.—I do not know that the natives discriminate between these species in favor of either one or the other. "The macerated root is also used as a remedy for piles" (Watson, Bot. Cal., 1:239).

Micrampelis Macrocarpa Greene.—The chilocothe vine, also belonging to the *Cucurbitaceae*, possesses similar properties to *Cucurbita palmata*. The root attains immense size, and is credited with having formed the basis of the once famous "Dr. Walker's Celebrated California Vinegar Bitters."

Trichostema Lanatum Benth.—The black sage is a small shrub found in the coast range from Monterey southward to Baja California(?), "cultivated in gardens of the Californians," and "valued as a stimulant" (Mrs. Bingham).

EDITORIAL.

The Botany of California, finished by Sereno Watson and published in 1880, through the generosity of gentlemen of

a past generation, uniform with and as a part of the state geological survey publications, marked the commencement of a new era of botanical activity on the Pacific coast. The next decade saw many additions to the state flora through the labors of a group of collectors who assiduously explored mountain and desert regions alike. In 1879 Heman Chandler Orcutt moved with his family from the Green Mountain state to San Diego, and took part in this work of exploration, which only ended with his life in 1892

Parry, Pringle, the Parish Brothers, Palmer and many others were especially active, with Gray, Greene, Brandegee, Watson and Vasey as the principal writers on their field work.

The last decade of the 19th century is noteworthy for the attempted changes in nomenclature as proposed by Kuntze, followed by Coville, Greene, Britton and other, mostly the younger, botanical authors.

In the present work the writer avoids the adoption of the most of the proposed changes, aiming to make it a supplement to Watson's great work—with this in view reproducing descriptions of species discovered since 1880. Notes and descriptions of all the plants would have been added but for the expense.

CATALOG OF MINERALS.

72 Azurite.	1
73 Andesite.	1
74 Limonite.	1
75 Garnet.	3
76 Malachite.	1
77 Cymatolite.	1
78 Dendrite.	1
79 Pink Feldspar.	1
80 Talc.	1
81 Breccia.	1
82 Sanidin Trachyte.	1
83 Aphanite.	1

84 Graphite.	1
Nos. 72-84 from the Black Hills, South Dakota, collected by L. W. Stilwell.	
85 Malachite.	Ky. Mrs. Lemon. 2
86 Malachite, San Pedro Martias Mt., Baja Cal.	D. K. Allen 6
87 Galena, Opulent mine*	7
88 Obsidian, Cantilles Mts. Baja Cal.	2
89 Cinnabar, Baja Cal	Mrs. Buckman. 4
90 Green spar, Riverside Cal.	H. C. Orcutt. 3
91 Cement rock, near boundary, Baja Cal.	J. A. Thoman. 1
92 Tourmaline, Vt.	H. N. Rust. 1
93 Gold ore, San Rafael, Baja Cal.	7
94 Ilmenite, Plymouth, Vt.	3
95 Mica, Enfield N. H.	H. C. Orcutt, 1877. 2
96 Blotite, Canyon Cantilles, Baja Cal.	H. C. and C. R. Orcutt July 1884. 3
97 Same as 93, San Nicholas mine.	2
98 Gold and silver ore*	20
99 Peacock copper ore, Baja Cal.	22
100 Dog tooth spar, Black Hills S. D.	1

(To be continued.)

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WANTS.

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—entom b 1st ser
and many others.
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TREES.

ORCUTT, San Diego, California.

STAMPS.

ORCUTT, San Diego, California.

BOTANY OF SOUTHERN CALIFORNIA



BY CHARLES RUSSELL ORCUTT.

San Diego, California.

FLOWERING PLANTS.

Phænogamous plants, bearing true fl (having stamens and pistils), and producing seeds which contain an embryo.

CLASS I.—DICOTYLEDONS.

Exogenous plants. Stems consisting of a pith in the center, of bark on the outside, and these separated by one or more layers of fibrous or woody tissue, which, when the stem lives from year to year, increases by the addition of new layers to the outside next to the bark. Embryo usually with 2 opposite cotyledons, or rarely with several in a whorl.

SUBCLASS I.—ANGIOSPERMÆ.

Pistil consisting of a closed ovary which contains the ovules and forms the fr.; cotyledons 2.

DIVISION 1.—POLYPETALÆ.

Petals distinct, or nearly so (sometimes absent).

RANUNCULACEÆ.

Crowfoot family: herbs or woody vines with colorless usually acrid juice, polypetalous, or spetalous with the sepals often colored and petaloid; sepals, petals, stamens & pistils all distinct; short; seed anatropous, embryo minute in firm fleshy albumen; stipules none.

Genus CLEMATIS Linnaeus.

Virgin's Bower: sepals petaloid, colored, valvate in the bud; piths numerous; akenes many in a head; leaves opposite.

§.—Petals 0; sepals 4, styles becoming long feathery awns in fr.

CLEMATIS LIGUSTICIFOLIA Nuttall.

Nearly glabrous, stems sometimes 30 ft. long, leaves 5-foliate, leaflets broadly ovate to lanceolate, 1½–3 inches long, acute or acuminate, 3-lobed & coarsely toothed, rarely entire or 8 parted, fl diœcious, paniculate, sepals thin, silky, w.

4–6 lines long; akenes pubescent, tails 1–2 inches long. o-m n j Abundant along water courses in the foothills and mt up to 6000 ft. he 52. da 1 V. CALIFORNICA Wat.

Leaves silky-tomentose beneath, often small, z s—the Sacramento. he 53

CLEMATIS LASIANTHA Nutt.

Silky-tomentose. stems stout, elongated; fl diœcious, solitary, on rather stout 1–2-bracted peduncles; sepals obtuse, thickish, 6–10 lines long; akenes pubescent. b—Plumas Co.

CLEMATIS PAUCIFLORA Nuttall.

Silky-pubescent; stem rather slender, short-jointed; leaves short & fasciated; leaflets 3–5, only 3–9 lines long, cuneate-ovate to cordate, mostly 3-toothed or 4-lobed; fl solitary or few & panicled, on slender pedicels; sepals thin, 4–6 lines long; akenes glabrous. s j he 52

Genus THALICTRUM Tournefort.

Meadow rue: sepals 4–7, greenish or petaloid; imbricated in the bud, petals 0, akenes 4–15 in a head, tipped by the stigma or short style, grooved, ribbed, or inflated; ovule suspended; fl in corymbs or panicles; leaves alternate, 2–3-ternately compound; leaflets stalked. ¶

§1.—fl diœcious; anthers linear, acute or acuminate.

THALICTRUM POLYCARPUM S. Wat.

Rather stout, 2–3 ft high, glabrous; leaves with short petioles or the upper sessile; leaflets variable, ¼–1 inch long; lobes acutish to acuminate; panicle narrow, often small, the staminate usually crowded on short pedicels; anthers acute, on very slender filaments; fr in dense heads, compressed, broadly oblong-obovate or obovate, abruptly acute, 2¼–3 lines long; seed linear, terete, nearly ½ inch long. j-o he 54 da 1

THALICTRUM OCCIDENTALE A. Gray

Of similar habit as *T. polycarpum*, leaflets rather larger, panicles more slender and open, the staminate very diffuse with slender elongated pedicels, styles more attenuate: fr 1-6 in each head, narrowly oblong (3-4 lines long) and narrowed at each end; seed nearly $\frac{1}{2}$ inch long. b-w Parish 1881 b mts. he 54

§2.—fl usually perfect; anthers small, elliptic-oblong, obtuse.

THALICTRUM SPARSIFLORUM Turcz.

Slender, glabrous, 1-3 ft high, leaves sessile or nearly so; leaflets $\frac{1}{4}$ - $\frac{1}{2}$ inch long, with obtuse often mucronate lobes; panicle loosely few-flowered; pedicels elongate: fr long heads nodding, the large divaricate akenes strongly compressed, semi-obovate, shortly pedicellate, slightly nerved. b-Alaska, Siberia, Utah, Col.

Genus MYOSURUS Linnaeus.

Sepals 5, spurred at the base; petals 5, linear, on a slender claw, with a pit at its summit; stamens 5-20; akenes very numerous, crowded on a long and slender spike-like receptacle; seed suspended. Very small herbs, with a tuft of linear or spatulate entire radical leaves, and solitary flowers on simple scapes. @ **MYOSURUS MINIMUS** Linn.

M. shortii Rafinesque in Sill J 1.379

Receptacle in fruit slender, 1-2 inches long; akenes blunt. Widely distributed in Europe, Asia, Australia and America; apparently indigenous in California.

Var. **APUS** Greene. Mesas, s.

Var. **FILIFORMIS** Greene. Mesas, s.

MYOSURUS APETALUS Gay.

M. aristatus Bth [vide G Torr el b 13 2].

Receptacle in fruit oblong or linear, 2-8' long; akenes long-beaked: less than 2' high. Utah; Chili; mesas, s.

Genus RANUNCULUS Linnaeus.

Crowfoot: sepals usually 5; petals 3-15, each with a small scale or pit at the base inside; pistils numerous; akenes in a head, usually flattened, beaked with the persistent style. Herbs, mostly perennial, of somewhat varied habit; fl either solitary or somewhat corymbed.

The section *Batrachium* is treated as a genus by Davis in *min bot studies* 460, the 2 following varieties being referred to *B. trichophyllum* Boesch prod fl bot 5.

§1.—**BATRACHIUM.****RANUNCULUS AQUATILIS** Linn.

Submerged, finely divided leaves.

Var. **TRICHOPHYLLUS** Chaix.

Stems long, coarsely filiform; peduncles 1-2' long; fl 3-5'' in diameter; akenes numerous in a close globular head, which is 2-3'' in diameter. b-i.

Var. **CÆSPITOSUS** DC.

Stems short, growing in mud: segments of leaves ligulate, 1'' or more long; fl 2-3'' in diameter. j

§ 2.—**HALODES**. Gray. Like § 3. immature carpels thin-walled and utricular, the sides nerveose: scapose and flagelliferous.

RANUNCULUS CYMBALARIA Pursh.

Greenland, Asia, North and South America.

§ 3 **EURANUNCULUS** Gray.

Petals (with nectariferous pit and scale, usually yellow) and sepals deciduous, the sides nerveless, not transversely rugose.

* Perennial by rooting from the nodes of creeping or the lower nodes of ascending stems, wholly fibrous rooted.

RANUNCULUS HYDROCHAROIDES G.

Southern California east of the Sierra (Kellogg), z

R. **FLAMMULA** L.

Var. **REPTANS** E. Meyer.

Southern California (Parish 996).

* * Thickened-fibrous and fascicled roots, terrestrial: stems short, erect or assurgent, not rooting from nodes above ground; mature akenes turgid and with introrsely apical or subapical rather subulate beak.

RANUNCULUS ALISMAEFOLIUS Gyr.

Idaho-Cal. R. bolanderi Ge Ca ac b 2:58 fide G.

† Heads of carpels in fruit oblong or cylindraceous; akenes more turgid, rounded, or at least obtuse on the back.

RANUNCULUS ESCHSCHOLTZII Schl.

†† Petals only 5; styles uncinat, recurved, shorter than the ovary, broad and flat.

RANUNCULUS CANUS Benth.
b mts. (Parish 1542).

‡ Lax or weak stemmed, petals 6-15; herbage hirsute or pubescent.

RANUNCULUS CALIFORNICUS Benth.

Erect or nearly so, 12-18 in. high, more or less pilose; radical leaves commonly plinnately ternate, leaflets laciniately 3-7 lobed; fls 5-10 lines in diam. with 10-14 narrowly obovate petals, a shorter reflexed sepals; akenes much flattened, with sharp edges, nearly 2 lines long; beak short & curved; heads compact, ovate or globular.

This Californian buttercup is the most abundant species of the genus in the state, 'where low grassy hills are often yellow with the shining fls in early spring.' Cuyamaca mountains.
Var. **LATILOBUS** Gray.

The common, coarse-leaved, more robust form.

RANUNCULUS HEBROANPUS Hook. & Arn.

Slender, 3-18 in. high, erect or procumbent; lower leaves ternate or 3-parted, leaflets cuneate at base & 2-3-lobed, upper ones more divided; akenes few, papillose-scabrous, with hooked hairs; fls minute, petals 5, a line or less long.

Var. **PUSILLUS** M. Wats., Bot. Calif. 1, 9, 1880.
'Stems very slender; rilliform, weak & ascending or procumbent, 3-6 in. long; leaves reniform crenately 5-lobed or parted.'—Watson.

RONGARDI Ge Erythraea 3:54

Var **douglasii** Davis Or d—reported by Rose.

Genus **ACTAEA** Linnaeus.

'Baneberry. sepals 4-6, nearly equal, petal-like, falling. fl early. Petals 4-10, small. Stamens numerous. Pistils single; stigma sessile, 2-lobed. Fruit a many-seeded berry. Seeds smooth, flattened, packed horizontally in 2 rows. Perennial herbs, with 2-3-ternately compound leaves. Root usually tuberous or thickened. Fls in a terminal short raceme. Species perhaps 2, belonging to the cooler regions of the Northern Hemisphere.'—Wats. Bot. Calif. 1, 12.

ACTAEA SPICATA Linn.

Var **ARGUTA** Torrey.

A. **arguta** Nutt.—Rare in Calif.—Alaska.

Genus **AQUILEGIA** Tournefort.

Columbine; sepals 5, regular, colored and petal-like deciduous. Petals 5, all alike, with a short, spreading lip, and produced backwards into a long tubular spur; stamens numerous, the outer ones long & exserted, the inner ones reduced to thin scales; pistils 5; styles slender;

ovaries several-ovuled, becoming pointed several-seeded follicles in fruit. Glabrous perennial branching herbs, with 2-3-ternately compound leaves, the leaflets lobed; fl showy, terminating the branches.

AQUILEGIA TRUNCATA Fisch. & Mey.

Genus **DELPHINIUM** Tournefort.

Larkspur; Cal. species are all perennial with showy fl; sepals 5, colored, petaloid, very irregular, the upper one prolonged backwards at the base into a long spur; petals 2-4, irregular; stamens many, pistils 1-5; fr of 1-5 dehiscent, many seeded follicles. Erect herbs, with palmately-cleft, lobed, or dissected leaves, and racemose fl.

*Blue (at least not red) fl.

DELPHINIUM CONSOLIDA Linn.

DELPHINIUM DECORUM Fisch-Mey.

Very handsome dark indigo blue fl, fs north to Mendocino county.

DELPHINIUM PARISHII A. Gray.

DELPHINIUM PARRYI A. Gray.

DELPHINIUM SIMPLEX Dougl.

DELPHINIUM VARIEGATUM T. & G.

**Red flowered.

DELPHINIUM NUDICAULE Torr-Gray.

½-2° high or more; Mendocino county

DELPHINIUM CARDINALE Hook.

Few—15 ft. high, stout, nearly glabrous; leaves large, 5-7-lobed nearly to the base, the divisions deeply 3-5-cleft with narrow long-acuminate segments; fls bright scarlet with yellow center, large, produced in showy panicles. Quite hardy.

Genus **PAEONIA** Linnaeus.

PAEONIA BROWNII Dougl.

PAEONIA CALIFORNICA Nutt

foothills; d b—usually distributed as brownii—perhaps running together. da 1, cv 458

Genus **CROSSOSOMA** Nuttall.

C. **BIGELOVII** Watson.

Genus **ANEMONE** Linnaeus.

A. **MULTIFIDA** P.C.

BERBERIDACEAE.

Genus **BERBERIS** Linnaeus.

BERBERIS DICTYOTA Jepson.

BERBERIS FREMONTII Torrey.

BERBERIS NEVINII A. Gray.

BERBERIS PINNATA Lagasca.

BERBERIS REPENS Lindl.

SARRACENIACEAE.

DARLINGTONIA CALIFORNICA Torrey
 'Calf's head,' a striking perennial of curious aspect, the only representative of the family in Calif. Of a greenish yellow hue, bearing a nodding purplish fl. One of the Pitcher plants, noted for its alluring insects to their death.

PAPAVERACEAE.

PAPAVER CALIFORNICUM Gray.
PAPAVER HETEROPHYLLUM Greene.
PAPAVER LEMMONI Greene.
PAPAVER HETEROPHYLLUM Ge.

Genus PLATYSTEMON Benth.

PLATYSTEMON CRINITUS Ge.
 'Subcaulescent, the foliage, scapiform peduncles, & the calyx densely crinite-hirsute with w soft spreading hairs 3 or 4 lines long: fl buds exactly globose: corolla an inch broad, the petals deep greenish yellow, marcescent persistent: stamens innumerable: filaments widely dilated: carpels many, the short to-uloge pods scarcely longer than the persistent linear stigmas.'—G. p. 112 13. Kern county.

PLATYSTEMON CALIFORNICUS Benth.

Slender branching annual, 2-12 in. high, vilous with spreading hairs: leaves 3-4 in. long, sessile or clasping, broadly linear, obtuse: peduncles 3-8 in. long, erect: sepals vilous: petals of late sulphur yellow, shading to orange in the center, 3-8 lines long: carpels 6-25, aggregated into an oblong head, smooth or somewhat hairy, 1-1 lines long, beaked with the linear persistent stigmas the 1-seeded divisions a line long: seeds smooth. Cal. e: 'Cream-cups' by the children. Southern Utah, Arizona, Mendocino county to San Diego, & Baja Calif. (Socorro).

PLATYSTEMON DENTICULATUS Gne.

Genus DENDROMECON Benth.

DENDROMECON FLEXILE Greene.

Greene Bull. Torrey Club, xiii. 215.
 —Bull. Calif. Acad. Sci. i. 389: Santa Cruz Island, 'on bushy hillsides everywhere: quite plentiful on the northward slope at no great distance from the shore.' he 55

DENDROMECON HARFORDII Kellogg.

DENDROMECON RIGIDUM Benth.

Shrub 2-8 ft. high, numerous slender branches, bark whitish: leaves ovate to linear-lanceolate, 1-3 in. long, very acute or mucronate, sessile or nearly so; twisted upon the base so as to become vertical, reticulately veined, margin rough or denticulate: flowers bright yellow, 1-3 in. in diam. on pedicels 1-4 in. long: capsules curved, attenuate above into the short stout style, 1½-2½ in. long: seeds 1½ lines long.

CANBYA CANDIDA Parry.

Scarce an inch high, densely branched, the somewhat fleshy leaves & short branches closely crowded, fls. w. petals 2 lines long: named in honor of William M. Canby (or mj). G. Am. ac. pr. 2: 51 t. 1 (27 D 1876) Water bot. ca. 2 420. he 55

Genus ROMNEYA Harvey.

ROMNEYA COULTERI Harvey. The Giant, white flowering, bush poppy.

Half-hardy shrub, 6-15 ft. high, branching and flexuous, woody at base: leaves glaucous, thickish, petioled, 3-5 in. long, the lower ones pinnatifid, upper ones pinnately toothed: petioles and margins often sparingly ciliate with rigid spinose bristles: the magnificent wax-like fls. 6-9 in. across: petals broadly obovate: filaments ½ in. long, bright yellow, purple at base: capsule oblong, 1-2 in. long, obscurely many angled, hispid with appressed bristles and crowned with the persistent stigmas: seeds black, a line or less long. Matilija poppy, named in honor of Dr. T. Romney Robinson, a noted astronomer. he 55

Genus PLATYSTIGMA Benth.

PLATYSTIGMA CALIFORNICUM B.-H.

PLATYSTIGMA DENTICULATUM Greene.

Greene Bull. Torrey Club, xiii. 218.

—Bull. Calif. Acad. Sci. i. 389. My. 28, 1887: Santa Cruz Island. he 55

PLATYSTIGMA LINEARE Benth.

Genus MECONOPSIS Viguer.

M. HETEROPHYLLA Benth.

MECONELLA DENTICULATA Greene.

"3-10' high: radical leaves entire, the laminal portion rhombic-ovate, acutish: cauline spatulate to linear, obtuse, sharply denticulate: petals narrowly oblong, 2" long: stamens 6-9. Temecula Canon, north of San Luis Rey, in San Diego county, Cal., March 27, 1855, by the writer."—Greene, Bull. Cal. Acad. Sci., ii. 59 (Mar. 6, 1886).

Genus ARGEMONE Linnaeus.

ARGEMONE CORYMBOSA Greene.

ARGEMONE HISPIDA A. Gray.

In A. platyceras L. & C.

ARGEMONE MEXICANA Linn.

ARGEMONE PLATYCERAS L. & O.

Genus ESCHSCHOLTZIA Cham.

ESCHSCHOLTZIA GLAUCA Ge.

ESCHSCHOLTZIA MARITIMA Ge.

ESCHSCHOLTZIA CAESPITOSA Bth.

ESCHSCHOLTZIA GLYPTOSPERMA Ge.

"Wholly glabrous and very glaucous: stems very short: fls. much dissected, but short

and compact: scape-like peduncles numerous, 8 inches high, terete, and rather stout: corolla as in [*E. tenuifolia*], but of a deeper yellow. seeds not reticulate, but deeply pitted and of an ash-gray color. A most peculiar species, collected in 1884, by Mrs. Curran, on the Mohave Desert. The seeds are remarkably unlike those of any other known *Eschscholtzia*.—*Ge Ca ac b* 1:70 (7 Mr 1885).

ESCHSCHOLTZIA MEXICANA Greene.

"Annual, smooth and glaucous; foliage less finely dissected than *E. californica* and *E. peninsularis*; stems short; peduncles numerous, stout and scape-like; petals an inch long, yellow or cream color; torus short, obconical, the outer margin a sub-cartilaginous ring, the inner erect, scarious, with stout nerves; seed globular, apiculate, with coarse but rather faint reticulations.—*E. Californica*, var. *parvula*. Gray. Pl. Wright, 2:10. *E. Douglasii*, Torr. Mex. Bound. 31; *Hemsl. Biol. Cent. Am.* This plant ranges from the region of the upper Gila, in New Mexico, far southward into Texas and adjacent Mexico, and is apparently a very good species."—*Ge Ca ac b* 1:69 (7 Mr 1885).

A rank-growing *Eschscholtzia* growing in the San Rafael valley, Lower California, with large reddish-orange colored flowers, was doubtfully referred to this by Prof. Greene.

E. LEMMONI Greene.

"Annual, 6-12' high, with numerous ascending branches, leafy below, hoary pubescent throughout, even to the capsules, with short spreading white hairs; leaves with elongated petioles; peduncles stoutish, quadrangular, the earliest scapiform; torus urceolate, 3-4' long, nearly glabrous, constricted just below the narrow, erect hyaline border; calyptra ovate, long acuminate, very conspicuously hairy; petals orange-color, nearly or quite an inch long."—Greene. *West Am Sci.* iii. 157. Ag 1887. Mountains of San Luis Obispo county.

ESCHSCHOLTZIA MODESTA Greene.

"Annual, very slender and diffusely branching, a foot high glabrous and moderately glaucous; leaves small, with few narrow segments; pedicels axillary, an inch long or more, terete & very slender, nodding in the bud. bud 2 lines long, the permanent portion (torus with no rim, nearly as long as the broadly ovate calyptra; corolla 6-8-lobed, spreading, ¼ inch broad; petals obovate, not meeting, the rounded apex

erose- or lobate-toothed, cr. in later flowers, deeply 3-lobed, pale y.; stamens 8 in 2 rows on opposite sides of the pistil, or, in late fls. 4 only; anthers 1, line long, on slender filaments a line in length; pod 2 inches long, narrow, the valves thin; seeds globular, minute, reticulate; cotyledons very narrowly oblongulate entire. Collected by S. B. Parish in L. Jo 18-7 (No. 1931)—*Ge Litt. vol 1:129* 6 2a 888.

ESCHSCHOLTZIA PARISHII Greene.

"Annual, slender, less than 1' high, glabrous and glaucous; stems simple or sparingly branched; peduncles terete, very slender; torus turbinate, no spreading rim, the 2 margins similar and approximate; petals widely spreading, broad and overlapping each other, apparently light y.; fr. not seen."—Greene, *Bull. Cal. Acad. Sci.*, 1. 183 (Aug. 29, 1885).

ESCHSCHOLTZIA PENINSULARIS Gn.

"Annual, smooth and glaucous, slender, erect, much more branched than *E. Californica*, with corollas of 1-3 the size and more broadly campanulate; rim of torus broader in proportion, the inner margin a very short, nerveless, hyaline ring; seed slightly elongated and distinctly apiculate at each end, reticulations less regularly foveate."—Greene, *Bull. Cal. Acad. Sci.*, 1. 68-9 (Mar. 7, 1885); l. c. 183.

ESCHSCHOLTZIA CALIFORNICA Chm.

The ♂ form; the ♀ plant is peninsularis.

ESCHSCHOLTZIA MINUTIFLORA S. W.

Distinguished by its small fls: e.

ESCHSCHOLTZIA RAMOSA Greene.

Ge Torr et b 13: 217. *Ca ac b* 2: 389. Santa Cruz & Guadalupe Islands.

FUMARIACEAE.

Tender herbs, with watery and bland juice, dissected compound leaves, & perfect irregular hypogynous fls with the parts in twos, except the diadelphous stamens, which are 6; ovary and capsule 1-celled with 2 parietal placentae; seeds, etc. as in *Papaveraceae*.

Genus DICENTRA Borkh.

Corolla flattened, heart-shaped or 2-spurred at the base.

DICENTRA CHRYSANTHA H. & A.

Dielytra chrysantha H. & A. *Bot Beech* 320. *Bikukulla chrysantha* C. v. 4:50.

Pale & glaucous, 2-5 feet high: leaves twice pinnate, the larger a foot long or more; the divisions cleft into a few narrow lobes: racemose panicle terminal, 1-2 ft long; sepals caducous: corolla linear-oblong or clavate, bright rich lemon y, over $\frac{1}{2}$ inch long, base slightly cordate: capsule oblong-ovate or narrower. Lake county-j

DICENTRA OCHROLEUCA Engelm
L fl w.ite.

CRUCIFERAE.

Genus ALYSSUM Tournefort.

ALYSSUM MARITIMUM Lam.

Lobularia maritima Desv. 'sweet alyssum' often cultivated for its fragrant fls, a native of the Mediterranean region in Europe, now widely naturalized in California.

Genus DRABA Linnaeus.

DRABA CORRUGATA Wat.
DRABA DOUGLASSII G.
DRABA UNILATERALIS Jones.
DRABA CUNEIFOLIA Nutt.
V. INTEGRIFOLIA Wat.

Genus CARDAMINE Linnaeus.

CARDAMINE INTEGRIFOLIA Gray.

LESQUERELLA PALMERI S. Watson.
"Pubescence dense, stellate-lepidote; caudex simple, apparently biennial, the simple stems 1° high or more: basal leaves narrowly oblanceolate, repand, the cauline narrower and mostly entire: petals spatulate, 3" long: pods pubescent, ovate-globose to broadly ellipsoidal, erect on long spreading or ascending pedicels; style as long as the pod; cells 2-4-ovuled. Arizona (Palmer, 1872); Lower California (C. R. Orcutt, 1884)."—S. Watson, Proc. Am. Acad., xxlii. 255 (May 29, 1888).

Genus ARABIS Linnaeus.

ARABIS ARCUATA G.
V. LONGIPES Wat.
ARABIS BECKWITHII Wat.
ARABIS FILIFOLIA Ge.
ARABIS LUDOVICIANA C. A. Meyer.
ARABIS PARISHII Wat.
ARABIS PERENNANS Wat.
ARABIS PERFOLIATA Lam.
ARABIS PLATYSPERMA G.
ARABIS PULCHRA Jones.
ARABIS REPANDA Wat.

ARABIS HOLBOELII Horn.
ATHYSANUS PUSILLUS Ge.

Genus CAULANTHUS Watson.

CAULANTHUS AMPLEXICAULIS Wat.
CAULANTHUS COULTERI Wat.
CAULANTHUS CRASSICAULIS Wat.
CAULANTHUS INFLATUS Wat.
CAULANTHUS PILOSUS Wat.
CAULANTHUS PROCERUS Wat.
CAULANTHUS GLANDULOSUS Hook.

Genus TROPIDOCARPUM Hooker.

T. GRACILE Hook.
T. DUBIUM Dav.

Genus THELYPODIUM Endl.

T. INTEGRIFOLIUM Endl.
T. LASIOCARPUM Greene.
V. inalleanum Robinson.
T. STENOPETALUM Watson.
T. WRIGHTII Gray.

Genus NASTURTIUM R. Brown.

N. CURVISILIQUA Nuttall.
V. laevis Watson
V. lyratum Watson
V. filipes G.
N. OFFICINALE R. Br.
N. OBTUSUM Nuttall
V. sphaerocarpum Watson

Genus LEPIDIUM Linnaeus.

L. BIPINNATIFIDUM Desv.
L. DICHOTYOTUM Gray
V. acutidens Gray.
L. FLAVUM Torrey
L. FREMONTII Watson.
L. LASIOCARPUM Nuttall
V. tenuipes Watson
L. INTERMEDIUM Gray
L. LATIPES Hook.
L. MEDIUM Greene
L. NITIDUM Nuttall
DENTARIA CALIFORNICA Nutt.
DITHYREA WISLIZENI E.

Genus CHEIRANTHUS Linnaeus.

CHEIRANTHUS ASPER C. & S.

Genus BARBAREA R. Brown.

BARBAREA VULGARIS R. Br.
V. ARCUATA Fries.
V. GLABRIOR Rob.
BISCUTELLA CALIFORNICA B. & H.
Is *Dithyrea wislizeni* E

Genus CAPSELLA Moench.

CAPSELLA DIVARICATA Walp.
CAPSELLA BURSA-PASTORIS Medic.
CAPSELLA ELLIPTICA C. A. Meyer.

Genus BRASSICA Linnaeus.

- BRASSICA ADPRESSA Boiss.
BRASSICA ALBA Boiss.
BRASSICA CAMPESTRIS L.
BRASSICA NIGRA Koch.

Genus SISYMBRIUM Linnaeus.

- SISYMBRIUM CANE-CENS Nutt. da2
SISYMBRIUM INCLUSUM E. da2
V. HARTWEGIANUM Wat.
SISYMBRIUM REFLEXUM Nutt. Ore
SISYMBRIUM ACUTANGULUM D.C. da2
SISYMBRIUM DIFFUSUM G. cv 4 68
SISYMBRIUM OFFICINALE Scop. da2

Genus ERYSIMUM Linnaeus.

- ERYSIMUM ASPERUM DC. da2 Ord
ERYSIMUM GRANDIFLORUM Nutt.
ERYSIMUM INSULARE Ge.
STANLEYA PINNATIFIDA Nutt. da2
e. pinnata Britton N Y ac tr 8:62. Cv 4:64

Genus STREPTANTHUS Nuttall.

- STREPTANTHUS CAMPESTRIS Wat.
STREPTANTHUS HETEROPHYLLUS Nutt.
STREPTANTHUS LONGIROSTRIS Wat.
LYROCARPA CULTEA H & H.
L. PALMERI Watson
RAPHANUS SAIVUS L. da2
Raphanistrum L. Wild radish, a bad weed.
THYMANOCARPUS CONCHULIFERUS Ge.
V. plastusculus Robinson.
T. CURVIPES Hook. Ord
V. elegans Robinson.
V. pulchellus Greene
T. P. SILLUS hooker.
T. LACINIATUS Nuttall.
V. CRENATUS Br.

CAPPARIDACEAE.**Genus CLEOME Linnaeus.**

- CLEOME INTEGRIFOLIA Nutt.

Genus CLEOMELLA De Candolle.

- C. BREVIPES Watson
C. OBTUSIFOLIA T-G.
C. OCCARPA Gray.
C. PARVIFLORA Gray

Genus ISOMERIS Nuttall.

- I. ARBORFA Nuttall
V. globosa cv

Genus WISLIZENIA Engelmann.

- W. REPENSIS Engelmann.
W. PALMERI Gray

RESADACEAE.**Genus OLIGOMERIS Cambess.**

- OLIGOMERIS SUBULATA Boiss.

CISTACEAE.**Genus HELIANTHEMUM Tournefort.**

- H. ALDERSONI Greene
H. GREENEI Rob.
H. occidentale Ge.
HELIANTHEMUM SCOPARIUM Nutt.

VIOLACEAE.**Genus VIOLA Linnaeus.**

- VIOLA CHRYSANTHA Hook.
VIOLA PEDUNCULATA T. & G.
VIOLA LOBATA Bentham
Var. Integrifolia Watson
VIOLA AUREA Kellogg.
V. premorsa Dougl. is said to be an older name.
VIOLA BLANDA Willd.
VIOLA PURPUREA Kellogg.

POLYGALACEAE.**Genus POLYGALA Tournefort.**

- POLYGALA CALIFORNICA Nutt.

Genus KRAMERIA Linnaeus.

- KRAMERIA CANESCENS A. Gray.
KRAMERIA PARVIFOLIA Benth.

FRANKENIACEAE.**Genus FRANKENIA Linnaeus.**

- FRANKENIA GRANDIFOLIA C. & S.
V. campestris G.
FRANKENIA PALMERI S. Watson.

CARYOPHYLLACEAE.**Genus SILENA Linnaeus.**

- S. GALLICA L.
S. CONICA L.
SILENA ANTIRRHINA Linn.
SILENA CALIFORNICA Dur.
SILENA LACINIATA Cav.
SILENA MULTINERVA S. Watson.
"Annual, erect, sparingly branched, glandular-pubescent, about 1' high: leaves linear to linear-oblong, acute, the lowermost narrowly oblanceolate, 1-2' long; inflorescence dichotomously cymose; bracts linear: calyx narrowly ovate, 20-25 nerved, 5-6" long, the acuminate teeth usually p-tipped; petals purplish, scarcely equalling the calyx, without appendages or auricles, emarginate; filaments glabrous, included: capsule nearly sessile, oblong-ovate, included: seeds minute, tuberculate, not crested. Found near Jamul, San Diego County, by C. R. Orcutt, in April, 1885, and on the island of Santa Cruz, California, by T. S. Brandegee, in

1888."—S. Watson, Proc. Am. Acad., xxv.
126-7 (Sept. 25, 1890).
SILENA PALMERI S. Watson.
SILENA PLATYOTA S. Watson.

Genus CERASTIUM Linnaeus.

CERASTIUM NUTANS Raf.
C. TRIVIALE Lnk.
CERASTIUM VISCOSUM Linn.

Genus STELLARIA Linnaeus.

STELLARIA MEDIA Linn.
S. NIELSEN Nuttall

Genus ARENARIA Linnaeus.

ARENARIA ALSINOIDES Willd.
ARENARIA DOUGLASHII T. & G.
ARENARIA MACRADENIA Watson.
ARENARIA MACROPHYLLA Hook.
SAPONARIA VACCARIA Linn.

Sagina occidentalis Watson da 3 w

Genus LEPIGONUM Fries.

LEPIGONUM GRACILE Watson.
LEPIGONUM MACROTHECUM F. & M.
LEPIGONUM MEDIUM Fries.

Genus POLYCARPON Linnaeus.

POLYCARPON DEPRESSUM Nutt.

Genus LOEFLINGIA Linnaeus.

LOEFLINGIA SQUARROSA Nutt.

ILLECEBRACEAE.

Genus PENTACAENA Bartling.

PENTACAENA RAMOSISSIMA H. & A.

Genus ACHYRONYCHIA Tor. & Gr.

ACHYRONYCHIA COOPERI T. & G.

PORTULACACEAE.

Genus PORTULACA Tournefort.

PORTULACA OLERACEA Linn.

Genus CALANDRINIA H. B. K.

CALANDRINIA BREWERI S. Watson.
CALANDRINIA MARITIMA Nutt.
CALANDRINIA MENZIESII Hook.
c. ELEGANS Spach

Genus CLAYTONIA Linnaeus.

CLAYTONIA CHAMISSONIS Esch.
CLAYTONIA EXIGUA T. & G.
CLAYTONIA PARVIFLORA Dougl.
CLAYTONIA PERFORATA Don.
California or Spanish lettuce; cv 4 72, da 3, j
CLAYTONIA SPATHULATA Dougl.

Genus CALYPTRIDIMUM Nuttall.

CALYPTRIDIMUM MONANDRUM Nutt.
CALYPTRIDIMUM PARRYI A. Gray.

Genus LEWISIA Pursh.

LEWISIA BRACHYCALYX Engelm.
LEWISIA REDIVIVA Pursh.
SPRAGUEA UMBELLATA Torr.

Genus FOUQUIERA H. B. K.

FOUQUIERA GIGANTEA Orcutt.

In February, 1899, the writer collected some small plants of the "curlo" tree, near the gold mines at Calmali, Lower California; May 2, 1900, the last two were planted in the ground in San Diego, having been in a box during the interim; the longest branchlets on one of these was over a foot long and bearing green foliage when at last planted in the ground. As there is no natural rainfall for two or three years at a time in the region where it grows, it is naturally well adapted to survive a long continued drouth; it is one of the most curious productions of the plant world, forming a tree often over 30 or 40 feet high, resembling a great carrot with its roots in the air. Dr. Albert Kellogg named it *Idria Colanaria*; later it was recognized as belonging to the genus *Fouquieria*. The 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.

FOUQUIERA SPLENDENS Engelm.

ELATINACEAE.

Genus ELATINE Linnaeus.

ELATINE AMERICANA Arn.
ELATINE BRACHYSPERMA Gray.
E. CALIFORNICA Gray

Genus BERGIA Linnaeus.

BERGIA TEXANA Seubert.

HYPERICACEAE.

Genus HYPERICUM Linnaeus.

HYPERICUM ANAGALLOIDES C.-S.
HYPERICUM SCOULERI Hook.

MALVACEAE.

Genus MALVA Linnaeus.

M parviflora L (borcallis Wallin) da 3 cv 4 78
M rotundifolium G Or s

Genus SIDALCEA A. Gray.

SIDALCEA MALVAEFLORA A. Gray.
SIDALCEA NEOMEXICANA A. Gray.
SIDALCEA PEDATA A. Gray.

S. delphinifolia Ge da 3
v. humilis Ge da 3
Modiola caroliniana Don. da 3

Genus MALVASTRUM A. Gray.

MALVASTRUM DENSIFLORUM S. W.
MALVASTRUM EXILE A. Gray.
M. fasciculatum Ge da 3
MALVASTRUM FREMONTII Torr.
MALVASTRUM MARRUBIOIDES D.-H.
MALVASTRUM ROTUNDIFOLIUM A.G.
MALVASTRUM THURBERI A. Gray.

Genus SPHAERALCEA S. N. Hilaire.

SPHAERALCEA AMBIGUA A. Gray.
SPHAERALCEA EMORYI Torr.
SPHAERALCEA FREMONTII Torr.

S. ORCUTTII Rose.

"Perennial (?), 60-80 cm high, with dense, stellate pubescence throughout; leaves thickish, ovate, entire or somewhat 3 lobed, with slightly cordate or truncate base, obtuse; fls small, in close, glomerate clusters, on short or long racemes; calyx 4 mm long, with ovate lobes; petals 8 mm long brick-red; styles clavate, thickened; carpels 12, reniform, strongly reticulated except the minute terminal portion, 2 mm in diameter, 1-seeded. Collected near Carrizo (not Anso) creek, e. 1 N 1890, by Or (No. 2210). This species, although referred to *Sphaeralcea*, can hardly be kept out of *Malveopsis*. The carpel is more like that of the latter genus than of any other known species, & yet very similar to those of *S. coulteri* and *S. californica*."—Rose unpub cont 1 289

SPHAERALCEA SULPHUREA S. Wat.

Genus SIDA Linnaeus.

SIDA HEDERACEA A. Gray.

Genus LAVATERA Linnaeus.

Genus HIBISCUS Linnaeus.

HIBISCUS DENUDATUS Benth.
HORSFORDIA NEWBERRYI A. Gray.
HORSFORDIA PALMERI S. Watson.

Genus ABUTILON Tournefort.

ABUTILON AURANTIACUM S. Wats.

"Woody at base, the herbaceous stems ½-2' high, pubescent and somewhat villous; leaves densely soft-tomentose, velvety and whitish, round-cordate, acute, the rounded basal lobes overlapping, unequally serrate, ½-1½' broad, shorter than the petioles; fl. axillary and solitary, on villous-pubescent pedicels, which are

as long as the petioles and mostly jointed near the base or the lower above the middle; calyx-lobes broadly ovate, acute; corolla bright orange, 6-9" long; calyx and fr. villous-pubescent; carpels 10, abruptly short-beaked, 3-seeded, 4" long, about equalling the calyx. On Todos Santos Bay, Lower California, by C. C. Parry, January, 1883, and at Tia Juana, by C. R. Orcutt. In May of the same year."—S. Watson. Proc. Am. Acad., xx. 357 (Feb. 21, 1885).

ABUTILON CRISPUM Sweet.

ABUTILON LEMMONI S. Watson.

"Perennial, the stout half-woody branching stems 1-2' high, hoary throughout with a very dense short stellate pubescence, its stellate character scarcely perceptible on the calyx; leaves cordate to cordate-lanceolate, acute or slightly acuminate, dentate, the blade usually 1' or less (sometimes 2') long, about equalling or shorter than the slender petioles, slightly greener above; peduncles axillary, solitary, shorter than the leaves, joined near the top; calyx with broadly ovate acute lobes; corolla y. or orange, small (3-4" long); carpels about 9, acute, 4-5" long, finely pubescent, 3-seeded, equalling or a little exceeding the enlarged calyx."—S. Watson, Proc. Am. Acad., xx. 357-8 (Feb. 21, 1885).

STERCULIACEAE.

Genus FREMONTIA Torrey.

F. CALIFORNICA Torrey
Fremontodendron californicum Cv 4:74.

AYENIA PUSILLA Linn.

LINACEAE.

Genus LINUM Linnaeus.

LINUM PERENE Linn.

ZYGOPHYLLACEAE.

Genus TRIBULUS Linnaeus.

TRIBULUS GRANDIFLORUS B. & H.
TRIBULUS MAXIMUS Linn.

Genus FAGONIA Linnaeus.

FAGONIA CALIFORNICA Benth.

Genus LARREA Cav.

LARREA MEXICANA Moric.

GERANIACEAE.**Genus GERANIUM Linnaeus.**

- GERANIUM CAESPITOSUM James.
GERANIUM CAROLINIANUM Linn.

Genus ERODIUM L'Herit.

- ERODIUM CICUTARIUM L'Herit.
ERODIUM MACROPHYLLUM H. & A.
ERODIUM MOSCHATUM L'Herit.
ERODIUM TEXANUM A. Gray.
Limnanthes douglasii R Br da 4

Genus OXALIS Linnaeus.

- OXALIS CORNICULATA Linn.
Fls lemon y, veined with crimson, near the center & on back of petals & calyx deeply tinged with carmine. s j
OXALIS OREGANA Nutt.
OXALIS WRIGHTII A. Gray.

RUTACEAE.**Genus PTELEA Linnaeus.**

- P. APTERA Parry. Or j

Genus THAMNOSMA Torrey.

- THAMNOSMA MONTANUM Torr.

Genus CNEORIDIUM Hooker, f.

- CNEORIDIUM DUMOSUM Hook. f.

CELASTRACEAE.**Genus EUNONYMUS Tournefort.**

- EUNONYMUS PARISHII Trelease.

RHAMNACEAE.**Genus ZIZYPHUS Juss.**

- ZIZYPHUS PARRYI Torr.

Parry's lotus or jujube is found in gravelly ravines near San Felipe and Rock Springs, in San Diego county, south into Lower California, and east of San Bernardino. The fruit is $\frac{1}{2}$ - $\frac{3}{4}$ inch long, of a dull brownish cadmium yellow color, mealy and dry. It is an unsymmetrical thorny shrub, 4-15 feet high. Said to make excellent jelly like its near relatives, the classic lotus and jujubes, so well known as the source of jellies and confections of various kinds.

Genus RHAMNUS Linnaeus.

- RHAMNUS CALIFORNICA Esch.
RHAMNUS CROCEA Nutt.

CONDALIA SPATHULATA A. Gray.**Genus ADOLPHIA Meisner.**

- ADOLPHIA CALIFORNICA S. Watson.

Genus CEANOTHUS Linnaeus.**CEANOTHUS CUNEATUS Nutt.**

CEANOTHUS DIVARICATUS Nutt. "Deer-brush," a beautiful flowering shrub, with delicate blue flowers.

CEANOTHUS INTEGERRIMUS H. & A.**CEANOTHUS ORCUTTHI Farry.**

"Branches flexible, dull reddish, with short, hispid pubescence; leaves petiolate, broadly orbicular to oblong-cordate, usually rounded obtuse, 30-40 mm. in length, often as broad, irregularly glandular-seriate, sparingly hispid above, strongly triple-nerved beneath, with prominent hairy ciliate veins; inflorescence axillary, oval scarcely exceeding the leaves, rather compact, with pubescent rachis, and smooth pedicels; fl. apparently white or light blue (seen only in fallen fragments); fr. glandular-hispid, with corrugated resinous epicarp, and conspicuous crests; seeds light brown."—Parry, Proc. Dav. Acad. Natl. Sci. v. 194 (Aug. 31, 1889).

CEANOTHUS RIGIDUS Nutt.**CEANOTHUS SOREDIATUS H. & A.**

C. spinosa Nutt da 4

C. oliganthus Nutt da 4

C. megacarpus Nutt da 4

C. crassifolius Nutt cv 478, da 4, (r 28 b

C. VESTITUS Ge.

"Near C. cuneatus, & like it in size & habit: leaves & branches ashy-tomentulose, the former opposite, coriaceous, subsessile, 4-6 lines long, round-obovate, obtuse or retuse, somewhat concave above, sharply spinulose-dentate all around: fls white: capsule apparently small, the short salient appendages inserted at about the middle." Ge ptt 2 101 da 4

C. verrucosus Nutt Or 53 j; d

C. hirsutus Nutt Or 54 d

SAPINDACEAE.**Genus AESCULUS Linnaeus.**

- AESCULUS PARRYI A. Gray.

Genus ACER Tournefort.

- ACER CIRCINNATUM Pursh.
ACER GLABRUM Torr.
ACER MACROPHYLLUM Pursh.

VITACEAE.

Genus *VITIS* Tournefort.*VITIS CALIFORNIOA* Benth. The wild grapevine of California.

ANACARDIACEAE.

Genus *RHUS* Linnaeus.*RHUS AROMATICA* Ait.*RHUS DIVERSILOBA* T. & G.*RHUS LAURINA* Nutt.

RHUS INTEGRIFOLIA Nuttall. A stout evergreen shrub, at times attaining to the rank of a tree, and a diameter exceeding five feet. The rose colored flowers produced in close panicles one to three inches long, followed by deep brilliant red berries, coated with an icy-looking, wax-like substance that is even more tart than the pleasantly acid berries. These berries make a cooling drink, equal to lemonade (almost indistinguishable in flavor.)

In Southern and Lower California this is often called Mahogany, from the rich and beautiful color of the wood.

RHUS OVATA S. Watson.

"A shrub, 5-10° high, glabrous excepting the finely pubescent branches and the bracts of the inflorescence: leaves coriaceous and shining, ovate, acute or acuminate, entire or rarely sparingly toothed, 2-3' long, on a stout, usually reddish petiole 4-8" long; fl. in dense closely paniced spikes ½' long or less, the rounded bracts and sepals purplish; petals light y.: fr. compressed-ovate, 2-3" long, viscid-pubescent."—S. Watson, Proc. Am. Acad., xx. 358-9 (Feb. 21, 1885).

The Sugar-bush is a handsome evergreen shrub, noted for its glossy foliage and graceful, oval form. The small dark red berries make a cooling drink, pleasantly flavored, resembling lemonade, and when dry are covered with a thin, waxy, white substance, that is very sweet, which the Indians are said to have formerly gathered for sugar.

LEGUMINOSAE.

Genus *THERMOPSIS* R. Brown.*THERMOPSIS CALIFORNICA* S. Wat.*HOFFMANSEGGIA MICROPHYLLA* Tr.*HOFFMANSEGGIA STRICTA* Benth.Genus *PICKERINGIA* Nuttall.*P. montana* Nutt. d northward.Genus *CERCIS* Linnaeus.*C. occidentalis* Torr. dGenus *HOSACKIA* Douglas.

This genus is included in the old world genus *Lotus* by Greene, Coville & others, along with *Syrmatium*; we prefer to retain all under *Hosackia*, though *Syrmatium* may well be treated as a distinct genus.

§1—*Euhosackia**H. OBLONGIFOLIA* Bentham.*H. CRASSIFOLIA* Benth.*H. GRANDIFLORA* Benth.*H. RIGIDA* Bentham.Var *AREYREA* S. Watson.*H. MARITIMA* Nutt.*H. STIGIOSA* Nutt.*LOTUS HUMILIS* Greene pit 2140—

"Hosackia maritima Ge pit 1 288 non Nutt.

Habit and texture of *salsuginosus*, but every way smaller, the branches apparently prostrate: leaflets 4 or 5, obovate, obtuse; peduncles shorter than the leaves, 1-3-flowered, naked or bracted; corolla 2' long, reddish, the banner & wings notably shorter than the broad obtuse abruptly inflexed keel; pod nearly terete, less than an inch long, 6-8 seeded: seeds very small, almost spherical, smooth. —Ge pit 2 140. San Bartolome bay. J Cv 4 88 mj

LOTUS TOMENTELLUS Ge

"Prostrate, much branched, canescently tomentulose: leaflets 5 or 7, cuneate-obovate or oblong, obtuse; peduncles slender, shorter than the leaves, the lowest bractless & 1-fl'd, the later often bracted & 2-fl'd: corolla y. 3' long, twice the length of the calyx; pod narrow, compressed, an inch or more in length, 5-7 seeded; seeds from orbicular to oval, compressed, the surface covered with a minute & low tuberculation."—Ge pit 2 140 J, cv 4 84 mj

§2 *microlotus**H. PURSHIANA* Bentham.*H. BRACHYCARPA* Benth.*Lotus humistratus* Ge Pittonia 2:189.*H. SUBPINNATA* T-G§3—*Syrmatium**H. GLABRA* Torr.*H. PROSTRATA* Nutt.*H. MICHANTHA* Nutt.*H. ARGOPHYLLA* Gray.*H. HEERNANNI* D. & H.

H. DECUMBENS Benth.

HOSACKIA HAYDONI Orcutt.

"Suffrutescent, 6-12' high or more, the slender stems woody at base, at first slightly spreading, then recurving inward and slightly intertwining, forming a loosely compact bush, glabrous or nearly so throughout: leaflets 3 or less, oblong, obtuse, 1-2 mm. long: fl. single or more rarely in pairs, short pedunculate, 2 mm long: calyx of equal length, the teeth narrowly subulate, erect, $\frac{1}{4}$ - $\frac{1}{2}$ as long as the tube: pod but slightly incurved, usually twice the length of the persistent calyx, 1-seeded: seed dark olive-green, 2 $\frac{1}{2}$ mm. long, slightly curved. I take pleasure in dedicating this delicate species to Mr. Marion D. Haydon, in return for his hospitality and for his directing my attention to various forage plants whose valuable qualities had previously been unsuspected. Collected in April, 1889, growing among the rocks in a canyon leading into the Colorado desert, on the old stage line from San Diego to Ft. Yuma. With *H. glabra*, Torrey, this plant is commonly known as deer weed, but its smaller growth will render it less valuable for cultivation and it is apparently too limited in its distribution to assume importance as a wild forage plant."--Orcutt, West American Scientist, vi, 63, Jl 1889.

SYRMATICUM DENDROIDEUM Greene.

"Shrubby, erect, 4-7° high, with roughish brown stem an inch or 2 in thickness, & many short ascending branches: branchlets angular, their growing parts more or less minutely appressed-silky, the plant otherwise glabrous: leaflets 3, narrowly oblong, obtuse: umbrils numerous, on short peduncles, not bracted: calyx 3-4" long, the triangular-subulate teeth $\frac{1}{4}$ as long as the nearly cylindrical tube: corolla 4-5" long: pod $\frac{3}{4}$ " long, slightly curved, 3-seeded: seeds terete & straight. Hill tops, among other bushes, on the higher parts of Santa Cruz Island. Near *S. glabrum*, but of entirely different habit, with much larger fls & fruit, on short, rigid, crowded branchlets."--sic Pitt 2146--referred to *Hosackia glabra* by Br Ca ac pr II 1 208, who says:--"Some of its forms are exactly the mainland plants."

Genus SOPHORA Linnaeus.

S arizonica Walp. z

Genus LUPINUS Linnaeus.

- LUPINUS AFFINIS Agardh.
 LUPINUS ALBICAULIS Dougl.
 LUPINUS ARIZONICUS S. Watson.
 LUPINUS BREVICAULIS S. Watson.
 LUPINUS CHAMISSONIS Esch.
 LUPINUS DENSIFLORUS Benth.
 LUPINUS DOUGLASHII Agardh.
 LUPINUS GRACILIS Agardh.
 L. burkei Or d
 L. arboreus Sm da 5
 L. albiflorus Bth da 5
 L. formosus bridgesii Ge da 5
 L. cystisoides Agardh da 5, cv 482
 L. nanus Dougl da 5
 L. umbellatus Ge da 5
 LUPINUS HIRSUTISSIMUS Benth.
 LUPINUS LITTORALIS Dougl.
 LUPINUS MICRANTHUS Dougl.
 LUPINUS ORCUTTHII S. Watson.
 "Diffusely much branched from the base, low (2-4' high), pubescent throughout with short stiffish spreading hairs: leaflets 5, oblong-spatulate, 3-6" long, shorter than the petioles: racemes numerous, sessile in the axils, 1-2' long, the scattered p. or reddish fl. 3" long: pod oblong, 4" long, 2-3-seeded: seeds 1" in diameter."--S. Watson, Proc. Am. Acad., xx, 259 (Feb. 21, 1885).
 LUPINUS SPARSIFLORUS Benth.
 LUPINUS TRUNCATUS Nutt.

Genus TRIFOLIUM Linnaeus.

- TRIFOLIUM CILIATUM Nutt.
 TRIFOLIUM EXILE Greene.
 TRIFOLIUM FUCATUM Lindl.
 TRIFOLIUM GRACILENTUM T. & G.
 TRIFOLIUM INVOLUCRATUM Willd.
 TRIFOLIUM MACRAEI H. & A.
 v. alboparvum H-A da 4
 T ciliatum Bth da 4
 T bifidum Ge da 4
 T repens L da 4
 T roschildtum Ge da 4
 T stenophyllum Nutt da 4
 T depauperatum Desv da 4
 T cyathiferum Lindl da 5
 TRIFOLIUM MONANTHUM A. Gray.
 TRIFOLIUM MICROCEPHALUM Pursh
 TRIFOLIUM RUSBYI Greene.

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CONTENTS:

Medicinal plants	33
Editorial	38
Catalog of minerals	39
Wants	40
Botany of Southern California—I	41

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TRIFOLIUM TRIDENTATUM Lindl.

Genus MELILOTUS Tournefort.

MELILOTUS ALBA Lam.

MELILOTUS PARVIFLORA Desf.

Genus AMORPHA Linnaeus.

AMORPHA CALIFORNICA Nutt.

Genus MEDICAGO Linnaeus.

MEDICAGO DENTICULATA Willd.

bur clover or toothed medick, @ of the Mediterranean region, which has become naturalized in most warm countries, valuable forage, but more prominent in our gardens as a weed of rapid growth. da 5 js

MEDICAGO LUPULINA Linn.

Black medick, nouesuch, black grass, hop clover, @ or biennial, widely grown for pasture. Or 60 d

MEDICAGO SATIVA Linn.

Alfalfa is probably the best known & most extensively grown forage plant in America, & as known by many names such as lucern, purple medick, Spanish trefoil, Brazilian clover.

Genus PSORALEA Linnaeus.

PSORALEA CALIFORNICA S. Watson.

PSORALEA MACROSTACHYA D. C.

PSORALEA ORBICULARIS Lindl.

Genus GLYCYRRHIZA Linnaeus.

GLYCYRRHIZA LEPIDOTA Pursh.

Genus DALEA Linnaeus.

DALEA CALIFORNICA S. Watson.

DALEA EMORYI A. Gray.

DALEA MOLLIS Benth.

DALEA ORCUTTII S. Watson.

"Perennial, with numerous short slender herbaceous subprocumbent or ascending stems (3-4' long) from a woody branching rootstock, appressed silky-pubescent; leaves 4-6" long, the folded oblong-obovate leaflets (4-6 pairs) 1/2" long, glabrous above; peduncles about equalling the leaves; spikes short (1/2" long), somewhat crowded, the fl. reflexed or spreading; calyx short-villous, turbinate, the lanceolate acuminate teeth equalling or exceeding the tube; the p. orbicular banner and the wings scarcely exerted, the broad twice-longer keel p. on the inner margin."—S. Watson, Proc. Am. Acad., xx, 359 (Feb. 21, 1885).

DALEA PARRYI Torr. & Gray.

DALEA SCHOTTII Torr.

DALEA SPINOSA A. Gray.

Genus ASTRAGALUS Tournefort.

A LIMITUS Sheldon Minn bot studies b 9 126

"@, robust, bushy but not woody, minutely pubescent with sparse, ascending hairs; stems 2-3 dm high, erect, thick, striate; leaves 10-12

cm in length, numerous, rachis channelled; leaflets 1-3 1/2 cm in length, in 5-9 pairs, orbicular, obovate or oblong, rarely orbicordate, obtuse or retuse; stipules triangular-ovate, foliaceous, reflexed; peduncles thick, striate, exceeding in length the leaves, loosely subspicate; fls 10-15 mm in length, spreading or reflexed; calyx cylindrical, ap. crossed pubescent with nigrescent hairs, the teeth unequal, much shorter than the tube; corolla magenta colored when fresh, becoming violet when dried; legume 2-2 1/2 cm in length, chartaceous, horizontal or ascending, ovate, with a long, incurved tip, finely short-pubescent, minutely reticulate-veined, unifolcular, many seeded. Near Indian wells & Carriso creek e Or."

A ALBATUS Sheldon Minn bot studies b 9 128

"@ or perhaps biennial, whitened throughout with a fine, dense pubescence; stems 9-20 cm high, erect, simple, thick, 1/4 from the y'ish root, finely striate; leaves 4-6 cm in length, the rachis striate; leaflets 4-6 fl'ed: fls 5-8 mm in length, erect-spreading, becoming deflexed; calyx broadly campanulate, the abruptly pointed triangular teeth 1/2-1/2 the length of the tube; corolla whitish or ochroleucous; legume 11-12 mm in length, membranaceous-inflated, ovate-oblong, acuminate pointed, the ventral suture straight, the dorsal curved, softly white-pubescent, unifolcular, with neither suture introflexed, 2-6 seeded. Or e."

ASTRAGALUS ORCUTTIANUS S. Wats.

"Stems numerous, slender, decumbent, 1' long, sparingly strigose-pubescent; leaflets 8-10 pairs, rounded, 1-3" broad; peduncles shorter than the leaves, 2-3" long in fr.; raceme loose, few-fl.; calyx campanulate, 2" long, the teeth mostly equalling the tube; pod linear-falcate, ascending, coriaceous, attenuate to a stipe shorter than the calyx, with a dorsal groove and acute ventral suture, 2-celled by the intrusion of the dorsal suture, 9" long. Allied to A. Arizonicus, rather peculiar in habit, the small round leaflets upon an elongated rachis exceeding the raceme. In Cantillas Canon ("Tantillas" of Palmer), Lower California, by C. R. Orcutt, August, 1883."—S. Watson, Proc. Am. Acad., xx, 361 (Feb. 21, 1885).

ASTRAGALUS COULTERI Benth.

ASTRAGALUS CROTALARIAE A. Gray.

ASTRAGALUS DISPERMUS A. Gray.

ASTRAGALUS LEUCOPSIS T. & G.

ASTRAGALUS OCCARPUS A. Gray.

ASTRAGALUS PARISHII A. Gray.

ASTRAGALUS SONORAE A. Gray.

ASTRAGALUS STENOPHYLLUS T.-G.

ASTRAGALUS TRICARINATUS A. Gray.

ASTRAGALUS VASEYI S. Watson.

A COCCINEUS Br Zoc 2 72

"*Pro* caespitose densely white-hirsute petioles nearly as long as the leaves; leaflets, 12-15 oval to obovate, obtuse, 8-10 mm long; stipules triangular-lanceolate; peduncles considerably surpassing the leaves; fls numerous shortly pedicellate, clustered near the top; calyx cylindrical slender, the linear nearly equal teeth $\frac{1}{2}$ the length of the tube; corolla spreading, bright red, 35-40 mm long, double the length of the calyx; banner lanceolate: the oblong keel equalling it in length, very shallow a little curved not hiding the stamens, which are free for nearly $\frac{1}{4}$ their length; keel a banner barely emarginate; pods an inch long resembling *A. purshii*, but not mature & exact shape therefore not determinable." Or j e m j

A. purshii ? *coccineus* Py W 7 10

A. grandiflorus Wat Am ac pr 18 370 non Pajl.

A. pycnostachyus G da 5

A. nuttallianus DC Or d j

A. circumdatus Ge

A. gambellianus Sheldon Or 68 j d

A. didymocarpus da 5 & c non 1 - A

A. antiseili G da 5

A. tener G da 5

Genus OLNEYA A. Gray.**OLNEYA TESOTA** A. Gray.

Iron wood, palo hierro, una de gato; a beautiful tree, characteristic of the desert regions; the wood is of great density, rich, dark color, taking an extremely fine polish, when dry an axe makes slight impression. j e z

Genus VICIA Tournefort.**VICIA EXIGUA** Nutt.

Vicia americana Muhl da 5

Vicia linearis Ge da 5

Vicia sativa L. da 5

VICIA THURBERI Watson Am ac pr 25 120

"*id.*, about 1° high, the young leaves, etc., pubescent, becoming glabrous; leaflets 4-12, narrowly linear, acute, 3-7 lines long; stipules small, subulate-lanceolate or linear, not at all sagittate, entire; peduncles short (3-6" long), bearing 1 or rarely 2 small w or purplish fls; calyx nearly glabrous, the teeth rather short-acuminate; pods glabrous, sessile, oblong, obliquely acute at each end, about 8" long by 2 $\frac{1}{2}$ -3 broad, 5-7 ovuled. From southern Utah & Colo to z & n"—Watson.

VICIA HASSEI S. Watson.

"Often tall; leaflets 3-6 pairs, linear to narrowly oblong, acute or obtuse and apiculate, or more frequently truncate and emarginate or toothed at the apex; stipules semi-sagittate with the rather broad lower lobe usually 2-4-toothed; peduncles

6-15" long, 1-fl. or sometimes remotely 2-fl.; pod more attenuate at each end and short-stipitate. 5-9-ovuled, 9-16" long. On open grassy hills about Los Angeles, California, growing with *V. exigua*: Dr. H. E. Hasse. Also collected at Santa Cruz by Dr. C. L. Anderson, at Benicia by Dr. Bigelow (*V. exigua* var (?) *Californica* Torr. in Pac. Railroad Rep. 476), and on Guadelupe Island by Dr. Palmer."—S. Watson. Proc. Am. Acad., xxv. 129-130 (Sept. 25, 1890).

Genus ACACIA Willd.**ACACIA GREGGII** A. Gray.

Acacia Farnesiana Willd.—Dr. Harvard classes this among the medicinal plants of Texas, probably because "a decoction of the pod contains tannin."

Genus CASSIA Linnaeus.**CASSIA COVESII** A. Gray.**Genus LATHYRUS** Linnaeus.**LATHYRUS WATSONI** White he 75

"*Lathyrus californicus*. Stem stout, tall & more or less winged; stipules semi-sagittate, dilated & often coarsely toothed, or the upper narrower; leaflets 3-7 pairs, ovate oblong to linear-lanceolate, $\frac{1}{2}$ -2" long or more, acute or acuminate softly pubescent on both sides, as also the rachis; peduncles stout, nearly equalling the leaves, many fl'd; calyx teeth short (the lower 2" long or less); petals 7-9" long, apparently y'ish or pinkish; pod linear, 2" long by 3" broad, attenuate at base to a stipe."—A at Am ac pr 20 303, he 73, r 78 d

L. venosus Muhl of former lists.

LATHYRUS SPLENDENS Kellogg.

Pride of California, distinguished for its profusion of large brilliant rose red to crimson fls borne in clusters of 10 or more the 2d year from seed—the most magnificent of the native climbing plants of West America. Or d. 76 j Also of promise as a forage plant; half-hardy.

Genus PARKINSONIA Linnaeus.**PARKINSONIA TORREYANA** S. Wat.

Parkinsonia aculeata L.—Valued by the Mexican Indians as a febrifuge and suborific, and also as a remedy in epilepsy (vide Schott). See Proc. U. S. Nat. Mus. VIII. 501.

Genus PROSOPIS Linnaeus.**PROSOPIS JULIFLORA** D. C.

The mesquite is the most abundant desert tree, rarely over 20 feet high,

often forming extensive groves miles in extent. The mesa back of San Diego, near the normal school, is its western limit, where it is only a small shrub, but it extends east to Texas and south to the Argentine republic.

PROSOPIS PUBESCENS Benth.

The screw-bean is a characteristic desert tree, slender, 15-20 feet high; not rare from Riverside county southward into Lower California, abundant in Palm valley, not far from San Diego.

ROSACEAE.

Suborder AMYGDALÆ

Genus **PRUNUS** Tournefort.

PRUNUS DEMISSA Walp.

PRUNUS ILICIFOLIA Walp. "Islay;" evergreen, or holly-leaved cherry; attractive for the beauty of its shining dark green foliage; fruit dull red, of a delicate flavor, with a kernel "almost equal in flavor to the almond." A desirable ornamental shrub and useful as a hedge plant.

The holly-leaf cherry is a beautiful dark evergreen shrub, yielding a pleasant edible fruit. Useful for hedges or ornamental planting.

PRUNUS FASCICULATA A. Gray.

PRUNUS FREMONTI S. Watson.

Suborder POMÆ

Genus **AMELANCHIER** Medicus.

A. ALNIFOLIA Nuttall

Shrub 3-8 feet high, glabrous throughout or often more or less woolly-pubescent; leaves broadly ovate or rounded, occasionally oblong-ovate, obtuse at both ends or acute, often somewhat cordate at base, serrate usually only toward the summit $\frac{1}{2}$ - $1\frac{1}{2}$ inches long; racemes short; calyx usually tomentose within; petals 3-12 lines long, narrowly oblong; fr mostly $\frac{1}{4}$ - $\frac{1}{3}$ inch in diameter.

Cv 4 97. British Columbia-j

Genus **HETEROMELES** J. Roemer.

HETEROMELES ARBUTIFOLIA Rœm.

The California toyon, or tollon, is a handsome evergreen shrub found throughout the state, better known as the Christmas berry, or California holly. The scarlet berries are borne in the greatest profusion, and, ripening at

Christmas time, are extensively used in decorating. The berries are said to have formed an important article of food with the Indians, and school children frequently eat them; but, so far as known, they are not otherwise utilized. They are not unpleasant to the palate, having a healthy, bitterish by-taste. The toyon is more useful as a hedge plant, doubtless, than for its fruit. It ranks high as an ornament in evergreen, the dark foliage forming a beautiful setting for the panicles of white flowers. It appears in many horticultural catalogues under the name of *Photinia arbutifolia*.

Suborder ROSACEÆ

Genus **RUBUS** Linnaeus.

RUBUS NUTKANUS. Mocino. Salmon-berry, the West American Mayberry; a singularly beautiful fruit, varying in color from a clear golden yellow to an orange red; delicious when served with sugar and cream.

RUBUS URSINUS C. & S.

R. vitifolius C-S *Linnaea* 2 10, cv 4 92

Genus **ALCHEMILLA** Tournefort.

ALCHEMILLA ARVENSIS Scop.

Genus **SPIRAEA** Linnaeus.

S. discolor Pursh da 5

Holodiscus discolor cv 4 91

Genus **ADENOSTOMA** Hook & Arn.

ADENOSTOMA FASCICULATUM H.-G.
ADENOSTOMA SPARSIFOLIUM Torr.

Genus **ROSA** Tournefort.

ROSA CALIFORNICA C. & S.
ROSA MINUTIFOLIA Engelm.

Genus **IVESIA** Torrey & Gray.

IVESIA BAILEYI S. Watson.

Genus **FRAGARIA** Tournefort.

FRAGARIA CALIFORNICA C. & S.

Genus **CERCOCARPUS** H. B. K.
CERCOCARPUS PARVIFOLIUS Nutt.

Genus **PURSHIA** De Candolle.

PURSHIA TRIDENTATA DC

Kunzia tridentata Spreng *Anleit* ed 2, 2 869.

Tigarea tridentata Pursh fl 1 833 (1814).

Genus **CHAMAEBATIA** Benth.

CHAMAEBATIA FOLIOLOSA Benth.

Genus **CANOTIA** Torrey.

CANOTIA HOLACANTHA Torr.

Genus **POTENTILLA** Linnaeus.

POTENTILLA CALIFORNICA Greene.

POTENTILLA PUBERULA Greene.

POTENTILLA SAXOSA Lemmon.

POTENTILLA CLEVELANDI Greene.

"Size and habit of [puberula], but more slender, more densely puberulent and not at all viscid; leaflets smaller, cuneate- to round-ovate, crenate-toothed; calyx half as large; filaments only lanceolate-dilated; anthers less than 1/2" long & nearly as broad; petals apparently pale y; pistils rather few; akenes hardly 1/2" long, broadly ovate with a slightly incurved tip, not compressed. Laguna mountains, back of San Diego, J1 1845, D Cleveland; also collected in n j by Or 905"—Ge. Plt 1:102 (8 N 1887).

SAXIFRAGACEAE.

Genus *SAXIFRAGA* Linnaeus.

SAXIFRAGA PARRYI Torr.

SAXIFRAGA REFLEXA Hook.

Genus *TELLIMA* R. Brown.

TELLIMA CYMBALARIA Walp.

Genus *HEUCHERA* Linnaeus.

HEUCHERA RUBESCENS Torr.

Genus *RIBES* Linnaeus.

RIBES MENZIESII Pursh.

RIBES SANGUINEUM Pursh.

RIBES SPECIOSUM Pursh.

RIBES VIBURNIFOLIUM A. Gray.

RIBES VISCOSISSIMUM Pursh.

CRASSULACEAE.

Genus *TILLAEA* Linnaeus.

TILLAEA ANGI-STIFOLIA Nuttall.

"Branching from the base, rooting; leaves linear-lanceolate, acute, connate, 1 1/2" long; fls axillary, solitary, on short pedicels; sepals 4, ovate, not half the length of the oblong white petals; carpels broad, obtuse, 8-seeded; style none, stigma minute; seeds nearly horizontal, linear-oblong, minutely tuberculate in longitudinal rows. Stems 1-2' high.

TILLAEA MINIMA Miers.

Genus *SEDUM* Linnaeus.

SEDUM SPATHULIFOLIUM Hook.

SEDUM VARIEGATUM S. Watson.

ROCHEA FALCATA DC. See *Crassula falcata*.

COTYLEDON ATTENUATA Watson.

A dwarfish species resembling *edulis*, with yellowish flowers, discovered in 1886, and introduced by C. R. Orcutt; useful for borders.

C. *Californica*—the true name of this pretty sp. proves to be *Sempervivum californicum*.

C. *EDULIS* Brewer (*Sedum edule*).

"Ladies' Finger Tips" so called from the round, slender leaves, said to be eaten for salad by the Indians; much larger than *attenuata*.

C. *LANCEOLATA* Bentham & Hooker.

Does well under good treatment, producing a

spike of red or yellow flowers. The lanceolate flat leaves sometimes of a dull crimson color, but commonly green; 6 inches across. da 6

C. *LAXA* Bentham & Hooker

Leaves curiously twisted; flowers red or yellowish—much like lanceolata otherwise.

C. *LINEARIS* Greene Lower California.

Another plant first introduced into cultivation by C. R. Orcutt, and similar to lanceolata.

C. *ORBICULATA* Linnaeus. South Africa

An old time garden favorite, attains a height of several feet and tropical in aspect; produces large pendulous orange colored flowers of rare beauty and permanence; of rapid growth

COTYLEDON ORCUTTII Greene.

Leaves attenuate, but different inflorescence, flowers tinged with pink; excellent border.

C. *PULVERULENTA* Pater.

A plant of great beauty when at its best, with broad leaves covered with a thick white powder, elegant in form. da 6

C. *SECUNDA* Baker. Mexico.

Very beautiful symmetrical plant—used extensively in parks, rockeries, borders, &c

COTYLEDON VISCIDA S. Watson.

Has dense apple green foliage and sprays of rose purple flowers; a great novelty.

CRASSULA FALCATA Wendl. A South African plant, grayish in color, producing gorgeous panicles of brilliant red flowers.

LYTHRACEAE

AMMANIA COCCINEA R.

A. *LATIFOLIA* L.

LYTHRUM ALBUM HBK.

L. *alatum* Pursh & v. *linearifolium* G.

L. *californicum* Watson.

LYTHRUM BYSSOPIFOIDIA L.

ONAGRACEAE

Eptilobium angustifolium . cv 4 102

E californicum Hauss da 6

E holosericeum Trel. da 6 cv 4 102

E coloratum Muhl.

E adenocaulon v *occidentale* Trel. da 6

Ludwigia palustris Ell. da 6

Zauschneria californica Presl. da 6, cv 4 103

Genus *GODETIA* Spach.

GODETIA EPILOBIOIDES S. Watson.

GODETIA TENELLA S. Watson.

G. *purpurea* Wat, da 6.

G. *quadravulnera* Spach. da 6

G. *bottle* Spach da 6 cv 4 106

Genus *BOISDUVALIA* Spach.

BOISDUVALIA DENSIFLORA S. Wat.

B. *CLEISTOGAMA* Cur. da 6

Jussiea repens L. da 6

Gayophytum diffusum T-G da 6

Clarkia elegans Dougl. da 6, cv 4 103

C rhomboldea Dougl. da 6

OENOTHERA BIENNIS Linn.

v *hirsutissima* Ge da 6

OENOTHERA BISTORTA Nutt.
v. velutiana Hook. da 6
 OENOTHERA BREVIPES A. Gray.
(E. leptocarpa) Ge da 6
(E. californica) Wat da 6
(E. virescens) Hook. da 6
(E. micrantha) Horn. da 6
(E. strigulosa) T-G da 6
(E. decorticans) Ge da 6
 OENOTHERA CARDIOPHYLLA Torr.
 OENOTHERA GAURAEFLORA T. & G.
 OENOTHERA REFRACTA S. Watson.

LOASACEAE.

Genus *PETALONYX* A. Gray.
PETALONYX LINEARIS Greene.
PETALONYX THURBERI A. Gray.

Genus *MENTZELIA* Linnaeus.
MENTZELIA ALBICAULIS Dougl.
MENTZELIA INVOLUCRATA S. Wat.
MENTZELIA LAEVICAULIS T. & G.
MENTZELIA MICRANTHA T. & G.
MENTZELIA TRICUSPIS A. Gray.
M. gracilentia T-G da 6
M. dispersa Wat. cv 4 108. da 6

Genus *EUCNIDE* Zuccarini.
EUCNIDE CORDATA Kellogg.
EUCNIDE URENS Parry.

CUCURBITACEAE.

Genus *CUCURBITA* Linnaeus.
CUCURBITA PERENNIS A. Gray.
 See *Cucurbita foetidissima*.
CUCURBITA PALMATA S. Watson.
Cucurbita Palmata Watson.—The mock orange and wild pomegranate are names frequently applied to this and other species of the genus *Cucurbita*. The root is very bitter, and a strong and quick emetic, acting "without any disagreeable effect on the nerves." In common with the following species this is known to the Mexicans as "Chilli Coyote," or "Calabazilla."
Cucurbita Foetidissima, H. B. K.—I do not know that the natives discriminate between these species in favor of either one or the other. "The macerated root is also used as a remedy for piles" (Watson, Bot. Cal., 1:239).

C. perennis G. da 6, cv 4 109
Micrampelis Macrocarpa Greene.—The chilocothe vine, also belonging to the Cucurbitaceae, possesses similar properties to *Cucurbita palmata*. The root attains immense size, and is credited with having formed the basis of the once famous "Dr. Walker's Celebrated California Vinegar Bitters."

M. macrocarpa Ge ca ac b 1 185 under *Echinocystis*; Pitt 2 120; cv 4 109.

Micrampelis fabacea Ge da 6
M. LEPTOCARPA Ge pitt 2 282 (1892).

"Habit of *M. fabacea*, but more slender, with smaller & more deeply lobed foliage: leaves very thin, rather sparsely & delicately scabrous: fls w, apparently open-campanulate rather than rotate; the staminate about 8-12 in a simple raceme; pistillate ones twice as large ($\frac{3}{4}$ " broad), with oblong prickly ovary $\frac{1}{2}$ " long or more; mature fr rather narrowly oblong, acute, about 5" long, less than 2" thick, strongly arched with flattened prickles $\frac{1}{2}$ -1" long; seed-cavities 2, each with perhaps 5 or 6 seeds, but these unknown. h—W & Wright"

Genus MEGARRHIZA Torrey.

M. californica Torrey - see *Micrampelis fab.*
ECHINOCYSTIS FABACEA Naudin.

See *Micrampelis fabacea*.
ECHINOCYSTIS GUADALUPENSIS Ch.
Micrampelis guadalupensis fide Ge.

DATISCEAE.

Genus *DATISCA* Linnaeus.
DATISCA GLOMERATA B. & H.
 "The root is a bitter tonic known as Durango root" (Mrs. Bingham).

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.

Genus ANHALONIUM Lemaire.

ANHALONIUM ENGELMANNI Lem Cact 42 (1865). Is A. *fissuratum* Engelmann.

A. *FISSURATUM* Engelmann.
 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*—*Mammillaria furfuracea* Watson—near *prismaticum*.

A. *LEWINII*—a form of *Williamsii*
 A. *SULCATUM* Salm Dyck, of a very distinct aspect, flattened top, small growth.

A. *WILLIAMSII*—more properly an *Fehinocactus*, "measly buttons"—see *Lophophora*.

Genus ARIOCARPUS Scheldw.

An older name than *Anhalonium*, recently revived by Schumann and other botanists, but we prefer to retain the name by which they are now have been universally known over 50 yrs.

Genus ASTROPHYTUM Lemaire.**ASTROPHYTUM MYRIOSTIGMA Lem.**

'Bishop's hood,' a beautiful thing, a odd. in

CACTUS DENSISPINUS Coulter.

Mammillaria densispina, *M. fuscata*. m

Genus CERESUS Haworth.**CERESUS ALAMOSENSIS Coulter.**

?*C. Sonora* Rung.; *sina* borbous; 2-8 ft. high, 2-10 branches from the base with joints 1-4 ft. long, flexuous or decumbent, often forming arches and rooting at the joints and thus widely spreading, often covering 100 feet; ribs about 7, slightly tuberculated, flower red. Mexico.

CERESUS BERLANDIERI Engelm.

A small decumbent species bearing large purple sweet-scented flowers.

CERESUS CAESPITOSUS Engelm. The

Lace Cactus, a beautiful little species, found in Texas and Mexico, with large magenta colored flowers, blooming when only 2 inches high, the flowers 2 inches across, and lasting 2 days. The plant is enveloped with fine white spines, and can be "handled without gloves."

CERESUS OHLORANTHUS Engelm.

A form of *viridiflorus*, with beautiful red and white spines and greenish flowers.

CERESUS COCHAL Orcutt.**CERESUS COLUBRINUS Otto.**

Native of C. ba; night blooming; sweet scented white flowers 6 inches across.

C. compressus (*triangularis* v.).

CERESUS DASYACANTHUS Engelm.

TEXAS; densely covered with delicately colored spines & bearing showy orange yellow fls

C. EHREBERGII Pfeiffer. Mexico.

Resembles *Berlandieri*, but larger & more erect

CERESUS EMORYI Engelm. 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.

CERESUS ENGELMANNI Parry. 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 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.

V. albispinus: ivory-white spines.

V. chrysocentrus: canary yellow spines.

V. variegatus: black & white spines.

CERESUS ENNEACANTHUS Engelm.**CERESUS ERUCA Brandegee.**

Chilenoia;

CERESUS FENDLERI Engelm.

Querc irregular caespitose plants, 3-4 inches in

diameter, about 6 inches high, rarely more than 12 heads in a cluster, distinguished by the one usually black central spine which often curves upward, magenta fls., variable.

CERESUS FLAGELLIFORMIS Haworth.

The well-known whip-cord or Rat's-tail Cactus, so useful in hanging baskets or for grafting on columnar species; the bright rose-colored flowers are extremely attractive.

CERESUS FOSCUATUS Hort. Mexico.**CERESUS GEMMATUS Zucc. Mexico.****CERESUS GIGANTEUS Engelm.**

CERESUS GRANDIFLORUS Haworth. "The night-flowering cactus 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.

CERESUS 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.

CERESUS 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.

CERESUS HOPPENSTEDTI.

CERESUS MAC DONALDIAE Hook. A handsome slender-stemmed species, of Honduras, Central America, and one of the finest of the night-flowering cacti. Flowers 12 to 14 inches across, with creamy white lanceolate petals, with an outer fringe of narrow yellow sepals; with a fragrant like vanilla.

We no longer consider this distinct from *Cer. grandiflorus*.

CERESUS MARITIMUS M. E. Jones.**CERESUS MOJAVENSIS Engelm.**

Occurs in almost inaccessible mountain canyons in the Mohave desert where its blood-red blossoms have oft enchanted the solitary prospector; the clusters of short heads form a very symmetrical plant like a cushion of green satin filled with needles—a form of *polyacanthus*

V. Zunilensis from Arizona—a finer form.

CEREUS MULTIPLIX Hort. (§Echinopsis).
Beautiful pink fls.

CEREUS NAPOLEONIS R. Graham.

Near triangularis—probably a form only?

CEREUS NYCTICALUS Link.

Yellowish fls., night-blooming, distinguished from grandiflorus by its 4-angled stems

CEREUS PACIFICUS (Engelmann) Coulter.

Form of polyacanthus, caespitose, crimson fls. Originally described as a form of phoeniceus.

CEREUS P. CTEN-ABORIGINUM Engelm.

Arct. ab ut 20 feet high, branching, bearing reddish fls. a curious spiny fruit resembling giant chestnut burr, from which the Indians made combs—hence its name; 'Hecho'.

CEREUS PECTINATUS Engelm.

§Echinocereus. Fragrant magenta fls.

CEREUS PENTALOPHUS De Candolle.

Related to Berlandieri.

CEREUS PERUVIANUS MONSTROSUS Hort.

Grotesque in the extreme.

CEREUS POLYACANTHUS Engelm.

Hardy, crimson fls., of easy growth.

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 wooly 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.

OLD MAN CACTUS.

CEREUS SENILIS Salm-Dyck.

§Pilocereus. The old man cactus attracts universal attention, receiving its popular & very appropriate name from the long, flexible, ivory white spines, giving the plant a most grotesque appearance, like the top of an old man's head in miniature. In Mexico it attains a height of 20 to 30 ft., 9 or 10 inches in diameter, its fluted character giving it somewhat the appearance of an architectural column. When young the stems are succulent, but with age the tissues become filled with 60 to 80 per cent. of oxalate of lime in small sand like grains.

CEREUS SPECIOSISSIMUS DC.

Mexico; bears a profusion large crimson fls. often 8 inches across

C. SPLENDENS Hort.

Our plants under this name are indistinguishable from colubrinus, but have not yet fld.

CEREUS STRAMINEUS Engelm.

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 if it is said for northern palates. It was named in honor of George Thurber, a widely renowned botanist.

CEREUS PROCUMBENS Engemann.

Near Berlandieri, spreading prostrate stems with fls. 3 inches across, rose purple.

CEREUS PUGIONIFERUS Lem.

None in stock, Mexico; form of geometrizans
CEREUS REGELII Hort

Form of grandiflorus, named in honor of Dr. R.

CEREUS RIGIDISSIMUS Engelm.

Echinocereus candelans of catalogs, famous as the Rainbow cactus, considered by Engelmann as a form of pectinatus

CEREUS SARGENTIANUS Orcutt.

§Pilocereus. Form of Schottii. 18 inch cuttings with beautiful flesh-colored hair.

CEREUS SCHOTTII Engelm.

§Pilocereus Sonora.

V. AUSTRALIS Brandegee, new.

CEREUS TRIANGULARIS Miller. The Strawberry Pear bears most beautiful flowers scarcely less handsome than *C. grandiflorus*, measuring 12 to 14 inches across; the bright scarlet fruit, the size of a goose's egg, has a flavor compared to strawberries; the plant is easily distinguished by its triangular stems, and makes a most luxuriant growth, climbing readily to the top of its support.

CEREUS TUBEROSUS.

The small tuberous roots produce slender stems 1-4 feet high, covered with a delicate network of interlacing white spines. Flowers terminal, over 2 inches across, pale rose purple. A liniment can be made by steeping the tubers in alcohol, "said to be a 'sure cure' for rheumatism." (*C. Posegerianus* Coulter & probably *C. Posegerii* Hort. are other names of this plant.)

CEREUS VARIABILIS Pfeiffer.

Engelmann's variabilis is the plant commonly sold under this name—the older stems triangular, armed with sharp straight spines, & a night bloomer, true name is *C. princeps* Hort. True Pfeiffer's variabilis I have yet to see.

CEREUS VIRENS DC.

Pilocereus Houledaunum & tilophorus, &c.

CEREUS VIRIDIFLORUS Engelm.

§Echinocereus. "Lovely purple & white spines."

Genus **ECHINOCACTUS** Link & Otto.

E. ACANTHODES Lem.

This old name has recently been revived by Dr. Weber of Paris for the plant now familiar to us under the name of *E. cylindraceus*.

E. AKRIGENS Link.

Waxy ribs, straight leaf-like central spines, with dark lilac flowers. None on hand.

ECHINOCACTUS BICOLOR Gal.

Fls. 2-8 inches long, bright rose purple; plant 4-8 inches high, with spines of rainbow tints.

ECHINOCACTUS BREVIHAMATUS E.

Body bright green, spines white & brown, the lower spines strongly hooked, profuse flowering.

ECHINOCACTUS CALIFORNICUS Mon.

E. viridescens has been cultivated in Europe it is said, but Dr. Weber has recently published a description of a plant from Lower California & claims it to be identical with Monville's plant. **E. CAPRICORNIS** Dietr. Mexico

Few deeply cut ribs spotted with white dots & entirely spineless but for a crown or tuft of interlacing spines; fls. satiny yellow with a deep red center; called an *Astrophytum* by some.

ECHINOCACTUS CHRYSANTHUS O.

Originally sent out as a variety of *Emoryi*, it is globose to cylindrical, with about 18 ribs & a flexuous annulated central spine 2 inches long, & 4 to many slender white radial spines; satiny yellow to crimson fls.

ECHINOCACTUS COPTONOGONUS Lm.

A small growing bushy plant, with few broad upturned light colored spines lying close to the ribs, fls. striped with purple.

ECHINOCACTUS CORNIGERUS DC.

Lizard cactus—broad sharply hooked reddish spines $\frac{1}{4}$ inch across.

Var. **FLAVISPIA**: yellowish spined; both var have rose purple fls. & are not very distinct.

ECHINOCACTUS CRISPATUS DC.

Mexico: 30-40 compressed ribs; fls. striped.

ECHINOCACTUS CYLINDRACEUS E.

Handsome, sometimes 10 feet high, fls. & spines yellow, but in young plants the color of the spines is variable—hence the following:—

Var. **ALBISPINUS**—with ivory white spines;

Var. **BICOLOR**—red & yellow spines;

Var. **RUBRISPINUS**—with red spines.

ECHINOCACTUS EMORYI Engelm.

ECHINOCACTUS ERECTOCENTRUS C.

Mamillaria Childs! A grand new Cactus from the mountains of Arizona. It is quite hardy, being found at a latitude where snow and ice is plentiful. One of the loveliest plants known to cultivation. Growth short and globular, with numerous spines which have a peculiar and beautiful luminous blue color, making it at all times a love object and a fine companion to the Rainbow Cactus. Its flowers are freely borne large, white, tinted pink and with a deep pink bar through the center. 30c. ea h: 2 or 3c. John Lewis Childs, 1894. with figure.

Near *E. intertextus*—a well marked variety.

E. ORCUTII Orcutt, Review 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 cen-

tral, annulated, the longest $1\frac{1}{4}$ 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 stigmas, style tinged with red, filaments red at top and yellow at base, anthers orange yellow.

Near Laguna head, Baja California, named for Lyman M. Ford, of San Diego, who has taken a great interest in these plants. Apparently the same plant was distributed in 1894 from near San Quintin bay as a form of *E. peninsulae*.

ECHINOCACTUS HORIZONTALONIUS Lem

Globose, globular, 8 ribbed, with clusters of rigid gray spines; fls. rose purple.

ECHINOCACTUS INTERTEXTUS Em.

Var. **DASYACANTHUS**—egg-shaped

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 LECONTEI Engelm.

Typical form not in hand; the Californian var. (perhaps a form of *cylindraceus*) is the plant commonly sold under this name.

ECHINOCACTUS LIMITUS Engelm.

Form only of *viridescens*—not distinct.

ECHINOCACTUS LONGIHAMATUS Gal.

Heavily notched dark green ribs with very long hooked central spines; fls. reddish.

E. LOPHOTHELI Saltn. Mexico.

Ribs broken into irregular tubercles bearing long central spines.

ECHINOCACTUS McDOWELLII Rebut.

A very beautiful *Mamillaria*-like species of Mexico, thickly set with long bright straw colored spines which completely hide the plant.

ECHINOCACTUS MULTICOSTATUS.

A remarkable species, small, with 90-120 narrow ribs. None on hand.

ECHINOCACTUS ORCUTTII Engelm.

ECHINOCACTUS PYPYRACANTHUS E.

No living plant known in cultivation.

ECHINOCACTUS PENINSULAE Eng.

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CONTENTS:

Medicinal plants	33
Editorial	38
Catalog of minerals	39
Wants	40
Botany of Southern California—I	41

Continuation only in this number—pages 81–88.

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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. subgloboseus, apice rotundatus; costis 13 crassis angulato-sinuatis, sinibus profundis acutis, areolis innatis demum subnudis, aculeis subduodenis, marginalibus 10-11 inaequalibus 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 Engelm.
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 3 to 5 inches high, ovate-globose, characterized by seven compressed white radial spines and four broad hooked central spines. Flower $1\frac{1}{4}$ inch long, petals and filaments pale straw color, the style and seven stigmata green.

E. WILLIAMSII Lem ex Salm.

"(Lem Cat. Cels. 1846, sine descriptione). C. humill inferae ramoso superne tuberculato cinerascens viridi, vertice impresso, tuberculis latis obsolete polyedris is costas subconfluentibus pulvillisque instructis remotiusculis lanigeris, lana cinerascens densa longa in penicillum erectum collecta. Floribus parvulis roseis."—Salm. AGZ. 1845, 325

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. **ALABAMA** 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. EYRIESII: 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 EPIPHILLUM Pfeiffer.

E. GAERTNERI: white fls.

E. MACOYANUM: ?

E. RUBRE-LIANUM:

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 *Achalaonium*, & more properly as an *Echinocactus* (which see).

Var **LEWINII** (*Achalaonium* 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 *impeticooma* 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.

One tuberled small-growing species with delicate & pretty yellow fls.

MAMMILLARIA DOLICHOCENTRA Lm

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

M. DIDICA 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-pitalias," the "llavina" of the Mexicans.

MAMMILLARIA ECHINUS Engelm.

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

MAMMILLARIA ELEGANS DC.

Next 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. FIS-URATA—see *Achalaonium fissuratum*.

M. FORDII Orent.

Ovate, 2 inches in diameter, and about 3 high, rarely branching at base; tubercles obtuse, $\frac{1}{4}$ inch across, short, 12 radial spines each one, $\frac{1}{8}$ - $\frac{1}{4}$ 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.

§*Cochemia*, cactus like, with straight, long stiff purplish brown spines, scarlet fls, similar to *Euphyllium*, a large red fruit.

MAMMILLARIA HEYDERI Muehlenpf.

Var **APPANATA** Engelmann.

M. KRAMERII, m

MAMMILLARIA LASIACANTHA Engelm.

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

M. LONGIMAMMA DC. Mexico.

Flower 1 1/2 inches across, 16 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 1/4-3 1/4 inches across of a distinct carmine & blue.

MAMMILLARIA MEDIACANTHA 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 **GRACIOSA**, larger.

MAMMILLARIA MINIMA Reiche. 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 a heavy soil.

M. NICHOLSONI Hort. Mexico.

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

MAMMILLARIA PECTINATA Engelm.

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

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

M. PFEIFFERI, 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 if 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.

Petter 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 correct but 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 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 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 areolae 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 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 1 405. ct 3: 454 461. Toumey (J-F 8: 325. cov 4: 112 242 277. He 91.)r 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 fr 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 l 405. ct 3: 425 462. Cov 4: 112 245. He 91. Fr 953.

"Prostrata vel adscendens; 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; In 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 tomentosissimis, aculeos 12-30 corneos stramineo-vaginato teretes undique porrectos gerentibus; ramulis versus apicem floriferis; ovario tuberculato, tuberculis sub-20 apice sepala subulata et areolas tomentosissimas 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. Wat l 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 397; bot ca 1: 259. Wp an 5: 56. Wat wh 9; l 405. Touney G-F 8:325. ct 3: 449, 461. Or W 6: 22 23 25. He 91. O. Bigelowii Fr 981.

Opuntia bonplandii 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 l 405. ct 3: 422 492. Cov 4: 113 240. He 91. Fr 952.

O. tidballii Bigelow Pac Ry r 4: 11.

OPUNTIA CURASSAVICA Mill.

OPUNTIA CYLINDRICA DC.

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CONTENTS:

Medicinal plants	33
Editorial	38
Catalog of minerals	39
Wants	40
Botany of Southern California—1	41

Continuation only in this number—pages 81-88.

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OPUNTIA DAVISII E. & B.

E-B 49 t 16. E syn 305. Wp an 5:55. Wat I 405. ct 3 445 460. He 91. Fr 978.

OPUNTIA DULCIS Engelm.

OPUNTIA ECHINOCARPA E. & B.
E syn 305; 1 14; bot ca 1:250. E-B 49 t 18 f 5-10 t 24 f 8 seeds. Wp an 5:55. Py Am nat 9:20. Wat I 406. ct 3: J45 460 461. Hm 550. cov 4:21 45 46 49 1:3 236 276-8. He 91 Fr 979.

OPUNTIA EMORYI Engelm.

E syn 393; bot ca 1:249; m b 53 t 70 71. Wp an 5:54. Wat I 406. ct 3:443 461. Hm 550. He 91. Fr 972.

OPUNTIA ENGELMANNI Sim-Dyck.

Sm 235. E Ld 207; Am J si 2 14: 338; syn 290 [34]; m b 47 t 75 f 1-4, seeds; bot ca 1:248. Scheer bot Her 293. Wp an 2:686; 5:49. Lab 460. Young F-Texas 278. Wat I 406. Hm 550. He a 68. Fr 950.

OPUNTIA FICUS-INDICA Mill.

Mill G-19 ed 8, no 2. (G F) 1:555. E syn 290 [24]; m b 49; bot ca 1:248 Wat I 406. ct 3:419 461. Hm 551. Or W 7:156; Ca board hort r 1890. He 91. Fr 931.

OPUNTIA FRAGILIS Haw.**OPUNTIA FULGIDA** Engelm.**OPUNTIA FULVISPINA** Sim-Dyck.**OPUNTIA GLAUCOPHYLLA** Wendl.**OPUNTIA GRAHAMII** Engelm.**OPUNTIA GRANDIS** Hort.**OPUNTIA INVICTA** Brandegee.

OPUNTIA LEPTOCAULIS D C. This is the widely advertised *O. frutescens*, Engelm., of Texas and Mexico; 2 to 4 feet high, with slender terete joints a fourth of an inch thick; very small yellow flowers; berries scarlet. Quite ornamental and a favorite with cactus fanciers.

OPUNTIA LURIDA Hort.**OPUNTIA MACROCENTRA** Engelm.**OPUNTIA MACRORHIZA** Engelm.**OPUNTIA MAMILLATA** Schet.**OPUNTIA MICRODASY** Pfeiff.**OPUNTIA MONOCANTHA** Haw.**OPUNTIA NIGRICANS** Haw.

OPUNTIA OCCIDENTALIS Engelm. A Prickly Pear of luxuriant growth, with stout woody stems and innumerable branches; joints 9 to 12 inches long and 6 to 8 inches across; flower yellowish and orange; fruit 2 inches long, very sour and juicy.

OPUNTIA PARISHII Orcutt.**OPUNTIA PHAEACANTHA** Engelm.

OPUNTIA PROLIFERA Engelm. This densely-branching shrub bears a small flower of a pomegranate purple, and once grew in great abundance where the city of San Diego now exists.

OPUNTIA RAFINESQUII Engelm.**OPUNTIA ROSEA** DC.**OPUNTIA RUFIDA** Engelm.**OPUNTIA RUTILA** Nutt.**OPUNTIA SENILIS** Roezl.

OPUNTIA SERPENTINA Engelm. Procumbent, with yellow flowers, comparatively rare in cactus collections.

OPUNTIA SUBULATA Engelm. A beautiful tropical species of rapid and rank growth, with persistent vivid green leaves, and long, straight spines.

OPUNTIA TENUISPINA Engelm.**OPUNTIA TESSELLATA** Engelm.**OPUNTIA TUNA** Mill.

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 WHIPPLEI** E. & B.**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 ½ 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.

PERESKIA ACULEATA Mill.

The Barbadoes gooseberry or Blad-apple, a cactus with leaves like an orange tree, excellent for grafting.

Genus PSEIFFERA Salm.

Only one species, which we have never seen.

Genus PHYLLOCACTUS Link.

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 anthers, 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, 1909).

PHYLLOCACTUS ANGULICER Lem.

Deep notches along the stems like the teeth of a large saw; fls pure white, fragrant.

P. BOLLWILLERIANA, fls carmine scarlet, 5 inches across.

P. Conway's Giant: fls often 2 ft. in diameter, deep scarlet shading to purple.

PHYLLOCACTUS CRENATUS Walp.

This species, which is a native of Honduras, needs in size and fragrance of its fls the factor of eight-blooming cactus. It grows to a height of 2 feet, with round base branches, the upper portion flattened out and the margins serrated, the flower tube 4 to 5 long, brownish green like the sepals; petals 4 in. long, creamy white.

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, anthers canary yellow. This is a general favorite in San Diego gardens, also, producing its lovely flowers in the greatest profusion.

QUEEN CACTUS.**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 WRAYI Hort.

Fls 8 in. across, yellowish-white.

Genus PILOCEREUS Lemaire.

Included under *Cereus*.

Genus RHIPSA LIS Gaertn.

RHIPSALIS CASSYTHA Gaertn.

RHIPSALIS SALICORNIOIDES Haw.

FICOIDAE.**Genus MESEMBRYANTHEMUM** Linn.

MESEMBRYANTHEMUM AEQUILATERALE, Haworth. Beach Strawberry or Sea-apple. An Australian and West American creeping plant, spreading readily over sandy ground, whether clayey, sandy or rocky. "Sheep are very fond of this succulent plant, and require but little water when browsing on it; or in cold coast districts they will do without any water, even in summer, while thriving well on the foliage." The brilliant red flowers are very fragrant, followed by large, sweet and delicious fruit, faintly suggestive of a strawberry. An ornamental plant, easily grown from cuttings.

The "beach strawberry," "sea apple," or "Hottentot fig," is a stout, prostrate perennial plant, abundant on the sea shore from Santa Cruz, California to Chili, Tasmania, and Australia being large, solitary brilliant rose-red flowers, that are very fragrant, followed by luscious dull-red berries that are very acceptable to children, large and small, when enjoying a day on the beach.

MESEMBRYANTHEMUM NODIFLORUM L.**MESEMBRYANTHEMUM CRYSTALLINUM****Genus SESUVIUM** Linnaeus.**SESUVIUM PORTULACASTRUM** Linn.

Or 2002 eJ. da 7. cv 4 114

UMBELLIFERAE.

C. Indulentes Coulter & Rose Revision N. A. Umbelliferae (D 888)

Genus HYDROCOTYLE Tournefort.**HYDROCOTYLE PROLIFERA** Kellogg.**H AMERICANA** L. da 7**HYDROCOTYLE RANUNCULOIDES** L.

H verticillata cr 137 cr d

Genus BOWLESIA Ruiz & Pavon.**BOWLESIA LOBATA** R. & P.**Genus ERYNGIUM** Tournefort.

E petiolatum Hook. da 7. cr 97 cr s J

E armatum C. R. d-Rutte county, Ca.

Genus DEWEYA Torrey & Gray.**DEWEYA ARGUTA** Torr. & Gray.

Is *Vevea arguta*

Genus VEVEA DC.

VEVEA ARGUTA (C. R. d) (Deweya a T-G fl d)

V. LATA PARISIII C. R. d 121

"Glabrous throughout, nearly aculeescent, about 1^o high; leaves thickish, terete-plumate-fid, the segments ovate, irregularly cuspidate-toothed & lobed, with revolute margins; umbel about 25-rayed, with no involucre & involucels of few setaceous bractlets; rays 2^o or

more long; pedicels about 4" long; calyx-teeth prominent; fr (immature) oblong, glabrous, about 3" long, with prominent ribs: oil-tubes 3 or 4 in the intervals, 4 or 5 on the commissural side."—C-R 121

VELEA VESITA C-R

Genus CARUM Linnaeus.

CARUM GAIRDNERI Beath. & Hook.

Genus OENANTHE Linnaeus.

OENANTHE CALIFORNICA S. Watson
(E. sarmentosa Presl v. californica fide C-R 82.)

Genus DAUCUS Tournefort.

DAUCUS FUSILLUS Michx.

Daucus Pusillus Michx.—Mrs. R. F. Bingham (S. B. Soc. Nat. Hist., C. 1:2-35) states that this is "very much valued by the natives as a remedy for the bite of the rattlesnake." She cites "one of our oldest physicians" as having "seen a Californian chew the plant, moisten his arm with the saliva, and then permit a rattlesnake to bite his arm, without producing swelling or any bad effect." She says the plant is usually applied in the form of a poultice. It is widely distributed from British Columbia to Mexico and eastward to the Atlantic, but I have not personally known of its use above stated, the "Golondrina" (a species of Euphorbia) possessing the same desirable reputation throughout the section where I have collected.

D. carota L. C-R 33 da 7

Genus SANICULA Tournefort.

SANICULA BIPINNATIFIDA Dougl.
SANICULA LANCINIATA Hook. & Arp.
SANICULA MENZIESII Hook. & Arp.
Stuberosa Torr. ca 7 C-R 107
Saudleaulis H-A da 7 la S. laciniata fide C-R

Genus PEUCEDANUM Linnaeus.

PEUCEDANUM DASYCARPUM T. & G.
PEUCEDANUM EURYPTERA A. Gray.
P. villosum Nutt. Or d C-R 64 z n
P. mohavense C-R 62, Curran m j
P. caruifolium T-G, C-R 68, da 7
P. utriculatum Nutt. C-R 67, da 7
P. Hasskei C-R da 7
P. parishii C-R 68, bot gazette 13 269; Parish b
P. vuseyi C-R 67, bot gaz 13 144; Vasey b mts
Stim erectum Huds da 7
Berula angustifolia Koch C-R 133; da 7
Clethra bolanderi Wat C-R 138; da 7
Pentstemon sativa L. C-R 49 da 7
Fenticulum vulgare Gært. da 6; C-R 108
Coriandrum sativum L. C-R 3; da 7
Selinum capitatum B-H C-R 43

Genus APIUM Linnaeus.

APIUM GRAVEOLENS Linn.

Genus APIASTRUM Nuttall.

APIASTRUM ANGUSTIFOLIUM Nutt.

Genus CAUCALIS Linnaeus.

CAUCALIS MICROCARPA H. & A.

ANGELICA TOMENTOSA S. Watson.

ARALIACEAE.

Aralia californica Watson da 7
Nedera helix L da 7

CORNACEAE.

Genus CORNUS Linnaeus.

CORNUS CAPITATA Wall. The Himalayan strawberry-tree, also known as Benthamia fragifera, Lindl.

CORNUS NUTTALLII Audubon. A showy tree, or large shrub, the flowers followed by large cluster of crimson berries. "Dogwood." Cornus californica C. A. Meyer
C. pubescens californica C-R da 7

Genus GARRYA Douglas.

G. flavescens Wat v palmeri Wat. Or d j

CAPRIFOLIACEAE.

Genus SAMBUCUS Tournefort.

SAMBUCUS GLAUCA Nutt.

The California elder is considered superior to either the eastern or the European species in the quality of its fruit. Edward J. Wickson says: "It is common throughout the state; and frequently becomes a tree 20 feet or more in height with a trunk 18 inches in diameter. The fruit is very abundant, and largely used."—California Fruits, Ed. 2, p. 65.

Genus SYMPHORICARPUS Dill.

SYMPHORICARPUS MOLLIS Nutt.
SYMPHORICARPUS RACEMOSUS Mx.

Genus LONICERA Linnaeus.

LONICERA HISPIDULA Dougl.

Lonicera subspicata Hook & Arm.—The "moronel" of the Mexicans is used by them in the form of a tea as a blood purifier; the plant is also used for the healing of sores.

RUBIACEAE.

Genus KELLOGGIA Torrey.

KELLOGGIA GALIODES Torr.

Genus GALIUM Linnaeus.

GALIUM ANDREWSII A. Gray.

GALIUM ANGUSTIFOLIUM Nutt.**GALIUM APARINE** Linn.

Gallum Aparine L.—"Cleavers are regarded as a most valuable cooling diuretic, useful in most diseases of the urinary organs" (Gunn). "Considered as a sovereign remedy in kidney diseases" (Mrs. Bingham). A cold infusion is used, as heat destroys its medicinal virtues. Goose grass, as this plant is sometimes called, is abundant in Southern and Baja California—in fact throughout the west, but our plant differs from the eastern and European form.

GALIUM PUBENS A. Gray.**GALIUM ROTHROCKII** A. Gray.

G californicum H-A da s

G spurium L da s

GALIUM STELLATUM Kellogg.**VALERIANACEAE.****VALERIANELLA MACROCERA** A. Gy.**COMPOSITAE.****Genus BRICKELLIA** Ell.**BRICKELLIA ATRACTYLOIDES** A. G.**BRICKELLIA CALIFORNICA** A. Gray.**BRICKELLIA FRUTESCENS** A. Gray.**Genus GUTIERREZIA** Lagasca.**GUTIERREZIA CALIFORNICA** T. & G.**GUTIERREZIA EUTHAMIAE** T. & G.**Genus ERIGERON** Linnaeus.**ERIGERON CANADENSIS** Linn.**ERIGERON FOLIOSUS** Nutt.**ERIGERON INCOMPTUS** A. Gray.**ERIGERON PHILADELPHICUS** Linn.**Genus SOLIDAGO** Linnaeus.**SOLIDAGO CALIFORNICA** Nutt.

Golden Rod, or "Oroja de Leabre" of the Mexicans, is prized above all other herbs for its curative properties in cases of either internal or external injuries of man or beast, the most stubborn of sores being said to quickly heal under its influence.

SOLIDAGO CONFINIS A. Gray.**Genus ASTER** Linnaeus.**ASTER ASCENDENS** Lindl.**ASTER ANDERSONI** A. Gray.**ASTER CANESCENS** Pursh.**ASTER EXILIS** Linn.**ASTER ... DULINUS** A. Gray.**ASTER ORCUTTII** Vasey & Rose.**ASTER PARVIFLORUS** A. Gray.**ASTER SPINOSUS** Benth.**Genus BACCHARIS** Linnaeus.**BACCHARIS DOUGLASSII** DC.**BACCHARIS EMORYI** A. Gray.**BACCHARIS GLUTINOSA** Pers.

Baccharis glutinosa Pers.—This, or another species of the genus, familiarly known as Mock willow, is held in some repute for the healing of sores. *Pluchea borealis* Gray, also known by the same popular name, perhaps shares in the same virtues and is, I believe, the plant known to the Mexicans as "water-motor"—credited with medicinal virtues without number!

BACCHARIS SAROTHOIDES A. Gray.**Genus PLUCHEA** Cass.**PLUCHEA CAMPHORATA** DC.**PLUCHEA BOREALIS** A. Gray.**Genus TESSARIA** Ruiz & Pavon.

T borealis T-G is *Pluchea* b.

Genus MICROPUS Linnaeus.**MICROPUS CALIFORNICUS** F. & M.**Genus PSILOCARPUS** Nuttall.**PSILOCARPUS OREGONUS** Nutt.**PSILOCARPUS TENELLUS** Nutt.**Genus STYLOCLINE** Nuttall.**STYLOCLINE GNAPHALIOIDES** Nutt.**Genus EVAX** Gaertn.**EVAX CAULESCENS** A. Gray.**Genus FILAGO** Linnaeus.**FILAGO ARIZONICA** A. Gray.**Genus GNAPHALIUM** Linnaeus.**GNAPHALIUM PALUSTRE** Nutt.**GNAPHALIUM PURPUREUM** Linn.**GNAPHALIUM SPRENGELII** H. & A.**Genus HYMENOCLEA** Torrey & Gray.**HYMENOCLEA MONOGYRA** T. & G.**HYMENOCLEA SALSOLA** T. & G.**Genus IVA** Linnaeus.**IVA HAYESIANA** A. Gray.**Genus AMBROSIA** Tournefort.**AMBROSIA PSILOSTACHYA** DC.**AMBROSIA PUMILA** A. Gray.**Genus PERITYLE** Benth.**PERITYLE CALIFORNICA** Benth.**PERITYLE EMORYI** Torr.**PERITYLE GRAYI** Rose.**PERITYLE GREENEI** Rose.**PERITYLE INCANA** A. Gray.**PERITYLE MICROGLOSSA** Benth.**Genus HETEROTHECA** Cass.**HETEROTHECA GRANDIFLORA** Nutt.**Genus APLOPAPPUS** Cass.**APLOPAPPUS BERBERIDIS** A. Gray.**APLOPAPPUS JUNCATUS** Greene.

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hoped but not a bad showing in the face
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CONTENTS:

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Wants	40
Botany of Southern California—I	41

Continuation only in this number—pages 97-104.

San Diego, California:

Number 365 Twenty-first street.

Charles Russell Orcutt Editor and Publisher.

Price 10 cents; \$1 a year; \$10 for Life.

THE HISTORY
OF THE
CITY OF
NEW-YORK

sparingly leafy, the stems tufted, and 2' high, from a woody base; leaves linear, the lowest broader and pinnatifid, the upper often only 3-toothed at apex, lobes and teeth all spinulose-tipped; heads few and corymbose, $\frac{1}{2}$ ' high; involucre turbinate, glandular-scarbose, not at all pubescent; scales setaceous-tipped; rays numerous, light y.; akenes conspicuously nerved."—Greene, Bull. Cal. Acad. Sci., i. 190 (Aug. 29, 1885).

APLOPAPPUS LINEARIFOLIUS DC

APLOPAPPUS ORCUTII A. Gray.

APLOPAPPUS PALMERI A. Gray.

"Pasmore" of the Mexicans and Indians is reputed to be invaluable in cases of lockjaw.

APLOPAPPUS SQUARROSUS H. & A.

Genus BIGELOVIA De Candolle.

BIGELOVIA BRACHYLEPIS A. Gray.

BIGELOVIA GRAVEOLENS A. Gray.

BIGELOVIA PANICULATA A. Gray.

BIGELOVIA SPATHULATA A. Gray.

BIGELOVIA TERETHIFOLIA A. Gray.

Genus CARPHEPHORUS Cass.

Genus DYSODIA Cav.

DYSODIA COOPERI A. Gray.

DYSODIA POROPHYLLOIDES A. Gray.

Genus EREMASTRUM Gray.

EREMASTRUM BELLIOIDES A. Gray.

EREMASTRUM ORCUTII S. Watson.

"Pappus consisting of 5 white oblong-ovate lacinate paleae and as many inner alternate bristles twice as long; in every other respect—habit, foliage, pubescence, involucre, etc.—the nearly exact counterpart of *E. bellioides*."—S. Watson, Proc. Am. Acad., xxv. 132-3 (Sept. 25, 1890). Southwestern part of the Colorado desert, San Diego County, California (C. R. Orcutt, April, 1889).

Genus COLEOGYNE Torrey.

Genus LESSINGIA Cham.

LESSINGIA GLANDULOSA A. Gray.

Genus HELIANTHUS Linnaeus.

HELIANTHUS CALIFORNICUS DC.

HELIANTHUS DEALBATUS A. Gray.

HELIANTHUS GRACILENTUS A. Gray

HELIANTHUS PETIOLARIS Nutt.

Genus VIGUIERA H. B. K.

VIGUIERA LACINIATA A. Gray.

VIGUIERA PARISHII Greene.

Genus LEPTOSYNE De Candolle.

LEPTOSYNE BIGELOVII A. Gray.

Genus BIDENS Linnaeus.

BIDENS CHRYSANTHEMOIDES Michx

BIDENS PILOSA Linn.

Genus MADIA Molina.

MADIA ELEGANS Don.

MADIA FILIPES A. Gray.

MADIA GLOMERATA Hook.

Genus HEMIZONIA De Candolle.

HEMIZONIA FASCICULATA T. & G.

HEMIZONIA FLORIBUNDA A. Gray.

HEMIZONIA HEERMANNI Greene.

HEMIZONIA PANICULATA A. Gray.

HEMIZONIA TENELLA A. Gray.

HEMIZONIA WRIGHTII A. Gray.

Genus LAYIA Hooker & Arn.

LAYIA CARNOSA T. & G.

LAYIA ELEGANS Torr & Gray.

LAYIA GLANDULOSA Hook & Arn.

LAYIA PLATYGLOSSA A. Gray.

Genus JAUMEA Pers.

JAUMEA CARNOSA A. Gray.

BURRIELIA MICROGLOSSA H. & A.

ERIOPHYLLUM AMBIGUUM A. Gray.

ERIOPHYLLUM CAESPITOSUM Dougl.

ERIOPHYLLUM CONFERTIFLORUM

ERIOPHYLLUM LANOST M. A. Gray.

ERIOPHYLLUM PRINGLEI A. Gray.

ERIOPHYLLUM STAECHADIFOLIUM

ERIOPHYLLUM WALLACEI A. Gray.

HIERACIUM ARGUTUM Nutt.

HIERACIUM PARISHII A. Gray.

HOFMEISTERIA PLURISETA A. Gray.

HYMENOPAPPUS FILIFOLIUS Hook.

HYMENOTHRIX WRIGHTII A. Gray.

LYGODESMIA EXIGUA A. Gray.

TRICHOPTILUM INCISUM A. Gray.

TRIXIS ANGUSTIFOLIA D. C.

Genus WYETHIA Nuttall.

WYETHIA CORIACEA A. Gray.

Genus XANTHIUM Tournefort.

XANTHIUM STRUMARIUM Linn.

Genus BAERIA Fischer & Meyer.

BAERIA AFFINIS A. Gray.

BAERIA ANTHEMOIDES A. Gray.

BAERIA CLEVELANDI A. Gray.

BAERIA CORONARIA A. Gray.

BAERIA GRACILIS A. Gray.

BAERIA MUTICA A. Gray.

BAERIA PALMERI A. Gray.

BAERIA PARISHII S. Watson.

BAERIA TENELLA A. Gray.

BAERIA ULIGINOSA A. Gray.

Genus LASTHENIA Cass.

LASTHENIA GLABRATA Lindl.

Genus BAILEYA A. Gray.

BAILEYA MULTIRADIATA H. & G.

BAILEYA PAUCIRADIATA H. & G.

Genus AMBLYOPAPPUS Hook & Arn.

AMBLYOPAPPUS PUSILLUS H. Arn.

Genus HULSEA Torrey & Gray.

HULSEA CALIFORNICA T. & G.
HULSEA VESTITA A. Gray.

Genus **PALAFXIA** Lagasea.
PALAFXIA LINEARIS Lagasea.

Genus **CHAENACTIS** De Candolle.
CHAENACTIS ASTEMISIAEFOLIA A. G.
CHAENACTIS CARPHOCLINIA A. Gray.
CHAENACTIS DOUGLASSII Hook & Arn.
CHAENACTIS FREMONTI A. Gray.
CHAENACTIS HETEHOCARPHA A. G.
CHAENACTIS LANOSA D. C.
CHAENACTIS MACRANTHA Eaton.
CHAENACTIS PARISHII A. Gray.
CHAENACTIS SANTALINOIDES Griseb.
CHAENACTIS STEVIOIDES Hook-Arn.
CHAENACTIS SUFFRUTESCENS A. G.
CHAENACTIS TENUIFOLIA Nutt.

Genus **HELENIUM** Linnaeus.
HELENIUM BIGELOVII A. Gray.
HELENIUM PUBERULUM DC.
Helenium puberulum DC.—This plant is common along water courses from San Francisco southward to Santo Tomas, Baja California. Bancroft says this plant is used by the Indians in the same way as we make use of sarsaparilla. Mrs. Bingham (l. c.) says it is "used as a tonic and antiscorbutic, and also in the form of a powder for catarrh." She gives the vernacular name as sneezewood. It is known to the Mexicans as rosea or rosilla (the proper spelling of the word) who inform me that the seed is the part mainly used medicinally.

Genus **SYNTRICHOPAPPUS** A. Gray.
SYNTRICHOPAPPUS FREMONTI A. G.

Genus **GRINDELIA** Willd.
GRINDELIA ROBUSTA Nutt.
Grindelia robusta Nuttall.—This is a popular remedy, especially recommended as a remedy for the effects of the poison oak (*Rhus diversiloba* Torr. & Gray), the plant being applied fresh, or a decoction or alcoholic infusion used (Mrs. Bingham). The crude drug sells at about \$5.00 per hundred pounds. A Russian scientist is at present engaged in a study of the medicinal properties of this plant and of the other species of the genus—most of which seem to possess the same valuable properties and some of which are doubtless often substituted for or confused with the typical *G. robusta* of Nuttall. One of these, *G. subsquarrosa*, I have recently supplied to an eastern firm, sending them about fifty pounds of the crude drug, for them to thoroughly test its properties.

Genus **PENTACHAETA** Nuttall.
PENTACHAETA AUREA Nutt.

PENTACHAETA ORCUTTII A. Gray.
"P. aureæ subsimilis; capitulis parvulis; involucre villosopubescente; bracteis viridioribus; ligulis brevioribus; pappi setis 8-10 capillaribus basi haud dilatatis caducis!—Vallecito, in the northern part of Lower California. C. R. Orcutt, May 4, 1886."—A. Gray, Proc. Am. Acad., xxii, 309 (March 4, 1887).

PENTACHAETA PALEACEA Greene.
"A span high, with very numerous ill-form branches; involucre small, scales in 2 series, pubescent, setaceous-tipped; corollas of ray and disk y.; akenes nearly linear; pappus-bristles 5, slender, with a thin, triangular palea at base."—Greene, Bull. Cal. Acad. Sci., 1: 189-190 (Aug. 29, 1885).

Genus **FRANSERIA** Cav.
FRANSERIA BIPINNATIFIDA Nutt.
FRANSERIA CAMPHORATA Greene.
FRANSERIA CHENOPODIIFOLIA Benth.
FRANSERIA DUMOSA A. Gray.
FRANSERIA FLEXUOSA A. Gray.
FRANSERIA HOOKERIANA Nutt.
FRANSERIA ILICIFOLIA A. Gray.
FRANSERIA TENUIFOLIA A. Gray.

Genus **ENCELIA** Adanson.
ENCELIA CALIFORNICA Nutt.
ENCELIA ERIOCEPHALA A. Gray.
ENCELIA FARINOSA A. Gray.
ENCELIA VISCIDA A. Gray.

Genus **CENTAUREA** Linnaeus.
CENTAUREA MELITENSIS Linn.
CENTAUREA SOLSTITIALIS Linn.

Genus **PEREZIA** Lagasea.
PEREZIA MICROCEPHALA A. Gray.

Genus **SILYBUM** Gaertn.
SILYBUM MARIANUM Gaertn.

Genus **CNICUS** Linnaeus
CNICUS CALIFORNICUS A. Gray.
CNICUS DRUMMONDII A. Gray.
CNICUS OCCIDENTALIS A. Gray.

Genus **CORETHROGYNE** De C.
CORETHROGYNE FILAGINIFOLIA Nutt.

Genus **STEPHANOMERIA** Nuttall.
PTILORIA CICHORIACEA Greene.
PTILORIA EXIGUA Greene.
PTILORIA PANICULATA Greene.
PTILORIA PARRYI Orcutt.
PTILORIA PAUCIFLORA Raf.
PTILORIA PENTACHAETA Greene.
PTILORIA VIRGATA Greene.

Genus **RAFINESQUIA** Nuttall.
RAFINESQUIA CALIFORNICA Nutt.
RAFINESQUIA NEO-MEXICANA A. G.
Genus **ANISOCOMA** Torrey & Gray.
ANISOCOMA ACAULE T. & G.

Genus MICROSERIS Don.

MICROSERIS ELEGANS Greene.
Spar or more high, slender, head less than 1½; akenes turbinate, slightly over 1" long; pappus ovate-deltoid, ½" long, the slender awn about 2". Mesas, San Diego, Cal.

MICROSERIS LINDLEYI A. Gray.
MICROSERIS LINEARIFOLIA A. Gray.
MICROSERIS MACROCHAETA A. Gray.

MICROSERIS PARISHII Greene.
"Kath r smaller and more slender than M. Douglasii; akenes slender, strictly columnar, 2" long or more, dark brown; pappus lanceolate, 3" long, very gradually tapering to an awn of 1 or 1½."—Greene, Bull. Cal. Acad. Sci., H. 46 (Mar. 6, 1889).

MICROSERIS PARRYI A. Gray.
MICROSERIS PLATYCARPHA A. Gray.
Span or more high, head ½ or less in length; main bracts of involucre about 8, oblong; akenes turbinate, 2" long, tapering abruptly into a very short awn. San Diego county, Cal., southward.

Genus MALACOTHRIX De Candolle.
MALACOTHRIX CALIFORNICA DC.
MALACOTHRIX COULTERI A. Gray.
MALACOTHRIX CLEVELANDI A. Gy.
MALACOTHRIX GLABRATA A. Gray.
MALACOTHRIX INCANA T. & G.
MALACOTHRIX INDECORA Greene.
MALACOTHRIX INSULARIS Greene.
MALACOTHRIX SAXATILIS T. & G.
MALACOTHRIX SQUALIDA Greene.

Genus GLYPTOPLEURA D. C. Eaton.
GLYPTOPLEURA MARGINATA Eaton.
GLYPTOPLEURA SETULOSA A. Gray.

Genus CALYCOSERIS A. Gray.
CALYCOSERIS PARRYI A. Gray.

Genus TROXIMON Nuttall.
TROXIMON GRANDIFLORUM A. Gray.
TROXIMON HETEROPHYLLUM Griseb.
TROXIMON RETROSUM A. Gray.

Genus SONCHUS Linnaeus.
SONCHUS ASPER Vill.
SONCHUS OLERACEUS Linn.
SONCHUS TENERRIMUS Linn.

Genus ACHYRACHAENA Schauer.
ACHYRACHAENA MOLLIS Schauer.

Genus LAGOPHYLLA Nuttall.
LAGOPHYLLA RAMOSISSIMA Nutt.

Genus POROPHYLLUM Vaillant.
POROPHYLLUM GRACILE Benth.

Genus ACHILLEA Linnaeus.
ACHILLEA MILLEFOLIUM Linn.

Genus ANTHEMIS Linnaeus.
ANTHEMIS COTULA Linn.

Genus ARTEMISIA Linnaeus.
ARTEMISIA CALIFORNICA Less.
ARTEMISIA DRACUNCULOIDES Psh.

ARTEMISIA LUDOVICIANA Nutt.
Artemisia ludoviciana Nutt.—Mrs. Bingham says this is "recommended for the effects of poison oak."
ARTEMISIA PALMERI A. Gray.
ARTEMISIA PARISHII A. Gray.
ARTEMISIA TRIDENTATA Nutt.

Genus COTULA Linnaeus.
COTULA CORONOPHOLIA Linn.

Genus SOLIVA Ruiz & Pavon.
SOLIVA SESSILIS R. & P.

Genus TETRADYMIA De Candolle.
TETRADYMIA CCMOSA A. Gray.
TETRADYMIA SPINOSA H. & A.
LEPTOSYNE MARITIMA A. Gray.

Matricaria discoidea DC.—"Used for bowel complaints" (Mrs. Bingham). "Said to be used in California as a domestic remedy for agues and bowel complaints" (Watson, Bot. Cal. I. 401.)

Genus ANTENNARIA Gaertn.
A dioica Gaertn b—W G Wright

Genus ACTINOLEPIS De Candolle.
A multi avilis DC da9
A tenella G da9
A Wa laeif G dn9 Ordj

Genus CHRYSOPSIS Nuttall.
C villosa Nutt Ord 582
Genus EUPATORIUM Tournefort.
E sagittatum G

Genus GAILLARDIA Fougereux.
G arizonica Orz
Genus MONOPTILON Torrey & Gray.
M bellidifforme T G

Genus PUGIOPAPPUS A. Gray.
P bigelovii, breweri & allopstedeus G
Genus PECTIS Linnaeus.

P papposa G Orjz
Genus SERICOCARPUS Nees.
S rigidus Lindl
Genus VENEGASIA De Candolle.
V car. esioifides DC
Genus VERBESINA Linnaeus.

V dissita G Orj
V encelloides Bth-Hook
Genus PSATHYROTES A. Gray.
PSATHYROTES RAMOSISSIMUS A. G.
PEUCEPHYLLUM SCHOTTII A. Gray.
Genus SENECIO Linnaeus.
SENECIO AMMOPHILUS Greene.

SENECIO CALIFORNICUS DC.
SENECIO CEDROSENSIS Greene.
SENECIO DOUGLASSII DC.
SENECIO LYONI A. Gray.
SENECIO MOHAVENSIS A. Gray.
SENECIO NEO-MEXICANUS A. Gray.
SENECIO PALMERI A. Gray.
SENECIO PARRYI A. Gray.
Scleranthus G. O. J.
Scyrycephalus T-G da 10
SENECIO PENINSULARIS Vasey-Rose.
SENECIO SYLVATICUS Linn.
SENECIO VULGARIS Linn.
Brickellia Nevinsii G da 8
Gutierrezia linearifolia Lag da 8
Euthamia microcephala G Ord da 8
Aster chamissonis G da 8
hesperius G da 8
Baccharis pilularis DC da 8
viminea DC da 8
plumerae G da 8
sergiloides G Cr 209 d
salicina T-G Ord [salleifolia Nutt.]
Palocarpus globuliferus Nutt da 8, he 145
Filago californica Nutt da 9
Gnaphalium decurrens Ives Ord, da 9
v californicum G b
microcephalum Nutt da 9
ramosissimum Nutt da 9
chilense Sp eng. da 9 is sprengellii
Acant. pappus sphaerocephalus G. b s, da 8
Conyza coulteri G Ord
Conyzella coulteri Ge da 8, he 136
Solidago sempervirens L. he 148, da 8
S. occidentalis Nutt. da 8
Euthamia occidentalis Nutt he 139
Rellia perennis L. Garreau daley. da 8 he 132
Chrysopsis villosa susaliflora G. da 8
villosa echinoides G da 8
Melampodium pertolatum HBK. da 9
Achillea Millefolium L.—Yarrow.
 "Used by the natives in the form of a poultice, for healing indolent ulcers. The fresh plant is also used for staunching blood in recent wounds" (Mrs. Bingham).
Bigelovia furfuracea Ge Ca ac b 137.
Lesingia germanorum Cham da 8
Helianthus annuus L da 9
oliveri G da 9
Leptosyne maritima G
douglasii DC Ord, da 9
calliopsidea G da 9
Mudra sativa Mol. da 9
disitiflora T-G da 9
Martynia —? Or d
Hemizonia ramosissima Benth. da 9
virgata G he 141, da 9
pungens T-G da 9
parryi Ge da 9

Gymnoloma multiflora B-H. da 9
Blenosperma californicum T-G da 9
Grindelia squarrosa Dunal Ord z
Chenactis glabruscula DC da 9
Beria chrysostoma F-M he 132, da 9
Crepis biennis L. he 150, da 9
Taraxacum dens-leonis Desv. da 10
Hieracium parishii G. he 151, da 10
Dicoria canescens T-G. Or 218 d, he 136
Monolopia major lanceolata G. da 9
Cotula australis Hook da 10
Lepidosparton squamata G da 10
Micosecis aphanocarpa G he 151
venella G da 10
Artemisia biennis Willd. da 10
trifida Nutt da 10
vulgaris L. v californica Besser da 10

—Omitted from page 59:—

Rhamnus tomentella Bth. — This shrub or small tree, evidently restricted in its distribution to the mountains of San Bernardino (Parish) and San Diego counties and of northern Baja California, is popularly known as the wild coffee bush, or Yerba loro. Dr. Rusby does not consider this to possess any useful properties—at least no virtues worthy of comparison with *R. Purshiana*. Its large black berries are sweet to the taste, but poisonous or at least unwholesome, as children sometimes find to their cost. The seeds are somewhat of the size and shape of coffee berries—whence the common name—and when separated from the pulp and roasted are said to form a fair substitute for coffee, though I should prefer not to experiment with it myself.

The bark of this species is popularly considered efficacious in severe cases of dysentery, and the leaves to possess cathartic properties—though both are conceded to be dangerous remedies. The receipt given me for dysentery is to take one pound of the bark of the root, boil in a quart of water until reduced to a pint.

—Omitted from page 48:—

Romneya coulteri Harv.—"A deadly poison." "The whole plant is used, bruised and boiled and applied as a poultice or taken in liquor"—my notes do not state whereof its virtue consists. It will naturally be inferred, however, that its properties are similar to those of opium.

12,423

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THE

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CONTENTS:

Medicinal plants	33
Editorial	38
Catalog of minerals	39
Wants	40
Botany of Southern California—I	41

Continuation only in this number—pages 105-110.

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Journal of mycology

Californian illustr. magazine v 3 Feb '94

Garden

Science

Torrey bot club bulletin

US Dept Agric bot b 1 3 9 10 11

—chem b 10 12 18 19 27 32 35-7

—entom b 1st ser

and many others.

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LOBELIACEAE.

Genus NEMA CLADUS Nuttall.

- NEMA CLADUS CAPILLARIS Greene.
- NEMA CLADUS LONGIFLORUS A. Gray.
- NEMA CLADUS PINNATIFIDUS Greene
- NEMA CLADUS RAMOSISSIMUS Nutt.
- NEMA CLADUS RUBESCENS Greene.
- NEMA CLADUS TENUSSIMUS Greene.

Genus DOWNINGIA Torrey.

- DOWNINGIA POLCHELLA Torr.
- LOBELIA SPLENDENS Willd.

- PALMERELLA DEBILIS A. Gray.
- PARISHHELLA CALIFORNICA A. Gray.

CAMPANULACEAE.

Genus GITHOPSIS Nuttall.

- GITHOPSIS DIFFUSA A. Gray.
- GITHOPSIS SPECULARIODES Nutt.

Genus SPECULARIA Helster.

- SPECULARIA BIFLORA A. Gray.
- SPECULARIA PERFOLIATA A. D. C.

ERICACEAE.

Genus ARBUTUS Tournefort.

ARBUTUS MENZIESII Pursh. Madrono. A surpassingly beautiful tree, with white flowers and orange-colored berries. Sometimes grows 100 feet high.

Genus ARCTOSTAPHYLOS Adanson.

Uva-ursi G syn fl 2 27; Daphnidostaphylis Klotzsch.

A UVA-URSIL

Bear berry—not reaching So. Calif.

- ARCTOSTAPHYLOS TOMENTOSA Lindl.
- Wooly Manzanita.

da 10

ARCTOSTAPHYLOS MANZANITA Parry. The common Manzanita of California. The berries make excellent sauce, and the finest quality of vinegar; much eaten by Indians.

Manzanita is a Spanish name, the diminutive of manzana (apple), hence means a "little apple." The name is generally applied to all the species of Arctostaphylos, and a writer in Meahan's Monthly (3:85) uses the name Arbutus Menziesii. The manzanita once so common on the mesas back of San Diego, is Arctostaphylos bicolor. The shrub to which the name more especially belongs in California, and which sometimes becomes a small tree, is that named Arctostaphylos manzanita by Dr. Charles Christopher Parry—the A. pungens of the earlier writers on

California botany. This manzanita is common from Mexico to Oregon, through the foothills and mountains, in dry, rocky soil. The fruit is a dull red, mealy, and pleasantly sub-acid, well-named by the Mexicans the "little apple," though botanically a near relative of the cranberry instead of the apple. The Indians gather the fruit in September in great quantities for food, and it is eaten freely by animals and birds. It makes excellent jelly, and the finest flavored vinegar, as clear as water, may be prepared from the fruit. The numerous other varieties of manzanitas all produce more or less similar edible fruit, and are all mostly small, straggly evergreen shrubs, graceful in their own peculiar way, and bearing in earliest spring time a profusion of lovely white blossoms, sometimes blushing a rosy red in a snow-storm.

ARCTOSTAPHYLOS PRINGLEI Parry.

Young branches, including the petioles and margins of the leaves, copiously ciliate-pubescent, with mixed glandular hairs leaves short, petiolate, glaucous, minutely net-veined, with conspicuous mid-nerve, ovate to broadly subcordate, abruptly short mucronate; inflorescence closely paniculate from a thickened base, intermixed with bud-scales, indicating a late flowering period. racemose branches slender, thickly covered as well as the bracts, pedicels and calyx, with ciliate and glandular hairs, bracts lanceolate membranous, petaloid, deciduous, bracteoles linear nearly 1/4 as long, pedicels slender, divaricate, 4-5 times as long as the bracts, calyx ciliate-glandular, corolla smooth, broadly urceolate; ovary and fr. glandular, hispid, nutlets irregularly coalescent, 5-7-celled."—Parry. Bull. Cal. Acad. Sci. II. 494 (Nov. 2, 1887).

Variety? drupacea Parry Ca ac b 2 495; — Differing from the above only in the completely consolidated stone, deeply sculptured, and usually with a conspicuous 1-sided furrow. Mts east of San Diego; Or 543; S 1886, distributed as A glauca."

Uva-coccus G

ARCTOSTAPHYLOS GLAUCA Lindl. The great-berried Manzanita.

Py Dav ac pr 4 34; Ca ac b 2 495; da 10 ARCTOSTAPHYLOS BICOLOR A. Gray.

Densely branched irregular shrub, 3-5 ft high, with brown shreddy bark; leaves dull green above, whitish tomentose beneath; fls in condensed racemes, w with



TRILLIUM SESSILE Linn.



ERYTHRONIUM GRANDIFLORUM



CALOCHORTUS VENUSTUS Dougl.



CALOCHORTUS PULCHELLUS Dougl.

a pinkish tinge; fr often persistent until 2d fl'ing in F, smooth & shining, deep red, $4\frac{1}{2}$ lines in diameter; copious and rather dense granular pulp; putamen smooth externally, solid; 5-celled, 1 or more abortive. Or s j Py Dav ac pr 4 34; Xylococcus bicolor Nutt, Py Ca ac b 2 496. Arc clevelandi G?

ARCTOSTAPHYLOS PARRYANA Lmn.

"A much branched shrub, 3-5° high; foliage coriaceous, bright green; blade ovate or oblong $\frac{1}{2}$ -1' long, acute or obtuse, entire, conspicuously impressed veiny; petioles slender, $\frac{1}{4}$ - $\frac{1}{3}$ ' long; inflorescence panicleate corymbose, the pedicels & bracteoles w-tomentose; bracts foliaceous, narrow; bracteoles 2 or 3 lines long, deltoid, with calloustips; segments of the rotate calyx obtuse: fr ovate or globose, $\frac{1}{4}$ - $\frac{1}{3}$ ' long, y'ish; exocarp smooth & glabrous, rather thin; endocarp of from 5-7 firmly united bony carpels, apiculate at each end, & marked with longitudinal ridges corresponding with the back of the carpels: seeds 2 lin, long, incurved, w. Tehachapi mts."—Lemmon pitt 2 68

♂Comarostaphylis G:—fr warty, putamen solid, 5-celled.

A ARGUTA Zucc. v. *diversifolia* Parry.

"Shrub 6-15 ft high; stems 1-3 inches in diameter, with light gray bark slightly furrowed, on the upper branches shreddy, & on the young, growing shoots tomentose; leaves varving greatly in size & form, according to position or season of growth; in young, vigorous offshoots or suckers, broadly lanceolate, $3\frac{1}{2}$ ' long by $1\frac{1}{8}$ ' broad, smooth on both sides, reticulate, scarcely at all revolute; on the upper & fl'ing branches, narrowly lanceolate, strongly revolute, & tomentose beneath, in all more or less irregularly serrate, with mucronate cartilaginous teeth & short petioles. Inflorescence racemose, from the axils of the upper

terminal leaves, secund & horizontal, rachis, bracts, pedicels, and calyx long tomentose; bracts about $\frac{1}{2}$ as long as the pedicels, corolla 3 lines long, stamens 10 (occasionally 8), filaments bearded below, anther appendages about as long as the anthers; style shortly exerted; ovary hairy hispid above. Fr small, 2 lines broad, warty, with a solid 5-celled putamen cells more or less abortive. Needs comparison with the Mexican type, which probably includes several published species."—Parry Dav ac pr 4 35.

Or s j A polifolia B-W non H & K.

A colored portrait of this in Datos para la materia medica Mexicana, (pt 3 11) well represents our shrub. It enjoys in m the names madronyo borracho, and garambullo—the latter name in j is applied to *Cereus sargentianus*—and is in medicinal repute.

♂Micrococcus Py Dav ac pr 4 36:—Fr with thin pericarp, without mealy pulp, wrinkled at maturity; 4 or 5 nutlets easily separating—in 2 divisions.

*Pericarp persistent, nutlets 2-celled.

ARCTOSTAPHYLOS OPPOSITIFOLIA P

"Shrub 3-10° high, densely branched above, more or less naked below; stems 1-3' in diameter, with light greenish or gray bark smooth or with loose, shreddy fibers on the upper branches, young shoots minutely tomentose; leaves opposite or ternately whorled, narrowly lanceolate, entire, revolute, 1-2' long, 2-3'' wide, light green above, minutely tomentose beneath, with a prominent mid-nerve, the narrow blade gradually tapering to a short or obsolete petiole. Inflorescence panicleate, the lower floral branches in the axils of the upper opposite leaves, which higher up pass gradually into deltoid, more or less acuminate bracts, disposed in whorls of 3 or less at regular intervals, each bract subtending a branch or pedicel, & decurrent as a ridge down the rachis; pedicels 3 or 4

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CONTENTS:

Medicinal plants	33
Editorial	38
Catalog of minerals	39
Wants	40
Botany of Southern California—I	41

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times longer than the bract, bibracteolate close to the base; corolla orbicular, 2-2½" high, shortly urceolate, with broad, reflexed lobes; stamens 10, anthers comparatively large, as long as the appendages filaments short, densely bearded at base; style about twice the length of the ovary, included, or slightly exsert; ovary densely tomentose at the summit; fr orbicular, 2-3" broad, with a smooth, thin pericarp & scanty pulp, becoming wrinkled at maturity, enclosing 5 easily separated nutlets, nearly equal in size, & 2-celled by a partition from the ventral suture, occasionally both cells fertile or more or less abortive."—Parry Dav ac pr 4 36-37. Or j A salicifolia.

BRYANTHUS BREWERI A. Gray.

Genus RHODODENDRON Linnaeus.
RHODODENDRON OCCIDENTALE A. G.
Azalea, 2-6° high, mts above 5000°, d

Genus PYROLA Tournefort.
PYROLA APHYLLA Smith.
PYROLA PICTA Smith.

Genus SARCODES Torrey.
SARCODES SANGUINEA Torr.

PTEROSPORA ANDROMEDEA Nutt.

PLUMBAGINACEAE.

Genus STATICE Linnaeus.
STATICE LIMONIUM Linn.
v californica G da 11

LENNOACEAE

Genus PHOLISMA Nuttall.
PHOLISMA ARENARIUM Nutt.
PHOLISMA DEPRESSUM Greene.
"Stems solitary, completely covered by the rhombic-ovate, or sometimes oblong, closely imbricated scales, fls in a depressed, barely convex head, an inch or 2 broad; sepals 6, linear-obliform, minutely glandular ciliate; corolla tubular-funnelform, 6 lobed, lilac-p; stamens shorter & style longer than in *P. arenarium*."—Ge ca ac b 1 198 j

Genus AMMOBROMA Torrey.

AMMOBROMA SONORAE Torr.

PRIMULACEAE.

Genus DODECATHEON. Linnaeus.
DODECATHEON CLEVELANDI Greene
"A foot or 2 high, pale green & glandular: new roots formed not at the end of the dry season but at its beginning, remaining dormant through the summer, no tubers formed either originally or by root-metamorphosis: leaves scarcely fleshy not depressed but ascending or erect, spatulate-obovate, the margins erose: fls 5-merous: corolla bright-p with a y base & some dark-p spots next the andræcium: andræcium about 3" long, filaments connate, the tube dark-p, the ornate exterior of each filament changing to y at the base of the anther & continued up the back of it nearly to the apex in a lanceolate form & lying in irregular folds; anthers otherwise p, not quite twice the length of the staminal tube, slightly divergent around the moderately exserted pistil, retuse at the rather blunt apex: capsule oblong, circumscissile at top: seeds reddish-brown, somewhat cubical, the testa sinuouly reticulate."—Ge pitt 1 214 Or s j

da 11. Or W 7 128 (& v alba & splendens), giant cyclamen, shooting star.
DODECATHEON ELLIPTICUM Nutt.
DODECATHEON HENDERSONI A. G.
DODECATHEON JEFFREYI Moore.

Ge ca ac b 1 406 82; pitt 1 210, 214.

These are mostly considered as forms of one species—the *D. Meadia* of Linn.

Genus ANAGALLIS Tournefort.
ANAGALLIS ARVENSIS Linn.

Poor man's weather glass da 11, Or j

Genus SAMOLUS Linnaeus.
SAMOLUS VALERANDI Linn.
v americana G da 11 Ge ca ac b 1 406

Genus CENTUNCULUS Linnaeus.
CENTUNCULUS MINIMUS Linn.

Genus GLAUX Linnaeus.
G. maritima L. Sea-milkwort, in saline soil round the northern hemisphere.

STYRACEAE.Genus **STYRAX** Tournefort.**STYRAX CALIFORNICA** Torr.**OLEACEAE.**Genus **MENODORA** Humb. & Bonpl.**MENODORA SCABRA** A. Gray.**MENODORA SCOPARIA** Engelm.Genus **FRAXINUS** Tournefort.**FRAXINUS DIPETALA** H. & A.

Flowering ash. j da II

F OREGANA Nutt. da II**APOCYNACEAE.**Genus **APOCYNUM** Tournefort.**APOCYNUM CANNABINUM** L.

Apocynum Cannabinum L.—Indian hemp possesses diuretic, cathartic, emetic and diaphoretic properties. Of wide distribution, from Oregon to Baja California, eastward to the Atlantic. A very useful remedy in many diseases, sometimes called American Ipecac.

Apocynum androsasemifolium L.—Of equally wide distribution as the last, with similar medical properties.

ASCLEPIADACEAE.Genus **PHILIBERTELLA** Vail.

"Calyx small, 5-parted, the lobes acute; corolla campanulate or rotate, deeply 5-parted, the lobes acute or obtuse, with a shallow entire or undulate ring forming an outer crown in its throat, the inner or staminal crown consisting of 5 turgid fleshy or hard scales, or flattish appendages, attached in a circle at the base of the sessile or slightly stalked gynostegium (column), forming a hollow entire or undulate spreading surface near the level of the conical stigmas; follicles naked, slender, attenuate at both ends or obtuse at the base. Twining herbs, or partly shrubby plants, of warm regions, with opposite glabrous pubescent or woolly leaves & umbellate sometimes fragrant & showy fls."—Anna Murray Vail Torr cl b 24 305 (Je 1897).

P HARTWEGII Vail lcvar *heterophylla* Vail**P. H. TELLE** VailGenus **ASCLEPIAS** Linnaeus.**ASCLEPIAS SUBULATA** Desne.

Asclepias Subulata Desne.—"Jumete" is a very powerful cathartic, equal in activity to croton oil. The Indians are said to use it in cases of syphilis after all other remedies fail to bring relief; an overdose often resulting in incurable insanity or death. In Mexico the juice of this or a similar plant is said to be often used in cases of emity, the victim of the insidious drug becoming insane for life if not mercifully relieved at once by death. Tradition says that Maximilian's unfortunate empress, Carlotta, was a victim of this drug, but the truth of this may never be known.

ASCLEPIAS ALBICANS S. Watson.

Asclepias Albicans Watson.—A larger species of jumete, from the Colorado desert and adjacent regions in Baja California, is credited popularly with the same powerful cathartic properties as the last.

ASCLEPIAS ERIOCARPA Benth.**ASCLEPIAS EROSA** Torr.**ASCLEPIAS MEXICANA** Cav.**ASCLEPIAS VESTITA** H. & A.**ASTEPHANUS UTAHENSIS** Engelm.Genus **GOMPHOCARPUS** R. Brown.**GOMPHOCARPUS TOMENTOSUS** A. G.Genus **SARCOSTEMMA** R. Brown.

S heterophyllum E is *Philibertia linearis heterophylla* fide G

PHILIBERTIA TORREYI A. Gray.**GENTIANACEAE.**Genus **ERYTHRAEA** Pers.**ERYTHRAEA DOUGLASII** A. Gray.

Erythraea Douglasii Gray.—"It contains a bitter, tonic principle, valued for malarial diseases, and known as 'conchalagua,'" (Mrs. Blingham) in common with other plants of the order Gentianaceae.

ERYTHRAEA MUHLENBERGII Griseb.**ERYTHRAEA VENUSTA** A. Gray.

Erythraea venusta Gray.—This is the common "conchalagua" of Southern and Baja California, which grows luxuriantly and abundantly in wet seasons and is usually gathered and kept con-

stantly in store by many Mexican and Indian families. The following letter, published in the West American Scientist (VI. 84) will here be found of interest as giving some reliable information regarding this and other native plants possessing medicinal virtue:

Editor of the West American Scientist—We beg to acknowledge receipt of your favor, and in reply thereto, we beg to state as follows: Conchagua ls. as you mention, the Erythraea venusta Gray, but more popularly known as California Centaury, Californian Pink, etc.

Medicinally it possesses valuable antiseptic and febrifuge properties, and is in high repute as a bitter tonic and stomachic, but we see no reason for considering it to be the "August Flower" so extensively advertised. (We have been informed that such was the case.—Editor.)

In regard to the other plant mentioned by you, Golondrina, we find that several species of Euphorbia, mostly the E. albomarginata, Torr. & Gray, and the E. prostata, Alt., have acquired a reputation as antidotes for snake poisoning, under the names of "Golondrina" and "Gollindrineria." (E. polycarpa, Benth., is the common Golondrina of the Mexicans of Southern and Lower California.—Editor.)

The latter name has been applied also to the Chelidonium majus, Linne, and the Euphorbia maculata, Linne, is known in some districts as Golondrina de Filipinas, or Gatas-Gatas de Filipinas. In the case of these last two plants, however, we find no record of their having been employed as snake-bite remedies.

Larrea Mexicana, Moricand, is popularly known as the creosote-bush or stinkw ed, and is credited with being possessed of valuable properties for the treatment of rheumatism and syphilitic diseases. Trusting that the above will be of interest, we are, very truly yours,
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Genus FRASERA Walter.

FRASERA PARRYI Torr.
FRASERA NITIDA Benth.

EUSTOMA EXALTATUM Griseb.

POLEMONIACEAE.

Genus POLEMONIUM Tournefort.

P confertum G Nevada, &c

Genus PHLOX Linnaeus.

PHLOX DOUGLASSII Hook.
PHLOX LONGIFOLIA Nutt.
PHLOX NANA Nutt.

P gracilis Hook da 11
P dolicantha G Parish 1838
PHLOX SPECIOSA Pursh.

V congesta G Parish 1839
P canescens T-G Parish 1617 b mts

Genus LOESELIA Linnaeus.

LOESELIA EFFUSA A. Gray.
LOESELIA GUTTATA A. Gray.
LOESELIA TENUIFOLIA A. Gray.

Loeselia tenuifolia Gray.—This herb is credited with valuable medicinal properties, being held in high repute by Indians and Mexicans for fevers and in other diseases. Some Mexicans once informed me however, according to my field notes, that it is a virulent poison "used only in venereal diseases." Without some actual knowledge of the properties of a plant it should be experimented upon with exceeding caution.

Genus COLLOMIA Nuttall.

COLLOMIA GRACILIS Dougl.
COLLOMIA GRANDIFLORA Dougl.
COLLOMIA HETEROPHYLLA Hook.

Genus GILIA Ruiz & Pavon.

GILIA ACHILLEAEFOLIA Benth.
GILIA ANDROSACEA Steud.
GILIA AUREA Nutt.
GILIA BELLA A. Gray.
GILIA BIGELOVII A. Gray.
GILIA BREVICOLA A. Gray.
GILIA CALIFORNICA Benth.
GILIA CALYTATA Dougl.
GILIA CILIATA Benth.
GILIA DEMISSA A. Gray.
GILIA DENSIFOLIA Benth.
GILIA DIANTHOIDES Endl.
GILIA FILIFOLIA Nutt.
GILIA FLOCCOSA A. Gray.
GILIA FLORIBUNDA A. Gray.
GILIA INCONSPICUA Dougl.
GILIA LATHIFOLIA S. Watson.
GILIA LATHIFLORA A. Gray.
GILIA LAXA Vasey & Rese.
GILIA LEMMONI Gray.
GILIA LINIFLORA Benth.
GILIA MICRANTHA Steud.
GILIA MULTICAULIS Benth.
GILIA NEVINII A. Gray.
GILIA ORCUTTHI Parry.

A span high, slender; leaves only 2 or 3 pairs up to the inflorescence, very small, with 3-4-5-6 divisions; fl. few, in the clusters; tube of the corolla less than 1/2 long, rather thick, dilated at summit, hardly longer than the turbinate campanulate throat and limb, its lobes ovate;

stamens and style included."—Parry. Proc. Dav. Acad. Natl. Sci. iv. 40 (1884).
 GILIA PARRYAE A. Gray.
 GILIA PUNGENS Benth.
 GILIA SESSEI Don.
 GILIA TENELLA Benth.
 GILIA TENIUFLOA Benth.
 GILIA VIRGATA Stend.

NAVARRETIA FOLIACEA Greene.

"Near *N. atractyloides*, but more diffuse and leafy, leaves ampler, less coriaceous and of a lighter green, their segments not wholly spinose, but herbaceous below; segments of the calyx very unequal, 2 large, ovate-acuminate spinose tipped and more or less recurved, 3 very small and only broadly subulate; corolla white, small, little surpassing the calyx; herbage scentless."—Greene, Pittonia, i. 138 (N 25. 1887). Potrero, San Diego county, al. (D. Cleaveland).

NAVARRETIA PENINSULARIS Greene.

"Diffusely branching. 3-10' high, glandular-puberulent and very viscid: leaves all acerose-pinnatifid: fls. rather few, in numerous scattered and mostly pedunculate glomerules: calyx sparsely hirsute, the segments subulate, entire, very unequal, the shortest fully equalling the tube the longest surpassed by the purplish corolla: capsule 3 celled, many-seeded. Hanson's ranch, in the northern part of Lower California, July 10, 1884, C. R. Orcutt, No. 1113. Related to *N. divaricata*, but sufficiently distinguished by its clamminess and different inflorescence, as well as by its larger corollas."—Greene, Pittonia, i. 136.

NAVARRETIA HAMATA Greene.

"Near *N. atractyloides*, and like it aromatic, but smaller and comparatively slender; leaves not foliaceous-dilated, but with a linear, or nearly linear rachis and few or many spinose-subulate segments of which the terminal one, and sometimes one or all of the lateral pairs are strongly recurved or else abruptly deflexed (forming hooks); calyx-segments all subulate and spinose-tipped, all erect, 2 twice as large as the others: corolla salverform, deep purple, large for the plant, the slender tube well exerted from the calyx. Guadalupe mt., Lower California, June, 1883. C. R. Orcutt. Also at All Saints bay, May, 1885 by the present writer."—Greene, Pit. i. 139 (N 25. 1887).

NAVARRETIA ATRACTYLOIDES Gne.
NAVARRETIA DIVARICATA Greene.
NAVARRETIA PROSTRATA Greene.
NAVARRETIA VISCIDULA Greene.

HYDROPHYLLACEAE.

LEMMONIA CALIFORNICA A. Gray.

Genus **NEMOPHILA** Nuttall.

NEMOPHILA AURITA Lindl.
NEMOPHILA INSIGNIS Dougl.
NEMOPHILA MENZIESII H. & A.
NEMOPHILA RACEMOSA Nutt.

Genus **ELLISIA** Linnaeus.

ELLISIA CHRYSANTHEMIFOLIA Bth
ELLISIA MEMBRANACEA Benth.

Genus **PHACELIA** Juss.

PHACELIA AFFINIS A. Gray.
PHACELIA CAMPANULARIA A. Gray.
PHACELIA CILIATA Benth.
PHACELIA CIRCINATA Jacq. f.
PHACELIA CORDIFOLIA S. Watson.
PHACELIA CURVIFES Torr.
PHACELIA DAVIDSONII A. Gray.
PHACELIA DISTANS A. Gray.
PHACELIA DOUGLASSII Torr.
PHACELIA FREMONTII Torr.
PHACELIA GRANDIFLORA A. Gray.
PHACELIA HETEROSPERMA Parish.
PHACELIA HISPIDA A. Gray.
PHACELIA IXODES Kellogg.
PHACELIA IYESIANA Torr.
PHACELIA LEUCANTHA Lemmon.
PHACELIA MICHANTHA Torr.
PHACELIA MOHAVENSIS A. Gray.
PHACELIA ORCUTTIANA A. Gray.
PHACELIA PARRYI Torr.
PHACELIA RAMOSISSIMA Dougl.
PHACELIA RUGULOSA Lemmon.
PHACELIA SUFRUTESCENS Parry.
PHACELIA TANACETIFOLIA Benth.
PHACELIA VISCIDA Torr.
PHACELIA WHITLAVIA A. Gray.

Genus **EMMENANTHE** Bentham.

EMMENANTHE PENDULIFLORA Bth.

Genus **TRICARDIA** Torrey.

TRICARDIA WATSONI Torr.

Genus **NAMA** Linnaeus.

NAMA DEMISSUM A. Gray.
NAMA HISPIDUM A. Gray.
NAMA PARRYI A. Gray.
NAMA ROTHROCKII A. Gray.
NAMA STENOCAPIUM A. Gray.

Genus **ERIODICTYON** Bentham.

ERIODICTYON ANGUSTIFOLIUM Nt.
ERIODICTYON CRASSIFOLIUM Benth.

"Densely tomentose-villous, the hairs straight: corolla salver-form, twice as long as the calyx, densely villous outside: seed finely about 10-striate, with innumerable minute transverse lines."—Greene, Bull. Cal. Acad. Sci., i. 201.

ERIODICTYON GLUTINOSUM Benth.

Eriodictyon glutinosum Bentham.—"Infusion of the balsamic-resiniferous leaves in spirit used as a tonic" (Watson, Bot., Cal., 1:518). This and *E. angustifolium* Nuttall are probably identical. The species is very variable. These shrubs are abundant in the hills and mountains of Southern and Baja California, and held in about equal repute as remedial agents by the Mexi-

cans who do not seem to distinguish between them. *E. sessilifolium* Greene, of the vicinity of Todos Santos bay, Lower California, is also known by the same name and credited with the same virtues. This seems to be a form connecting *E. glutinosum* and *E. angustifolium* with *E. crassifolium*.

ERIODICTYON SESSILIFOLIUM Grne.

Ge ca ac b 1:201. Br Zoe 4:208 j only.

E. intermedia Parry ined. Or 77 j

ERIODICTYON TOMENTOSUM Benth.

H. C. Ford gives the San Rafael mountains as the habitat of this species. Mrs. Bingham says: "Found on the banks of mountain streams, and used for lung diseases, but especially for diseases of the mucous membrane of the throat. The Yerba Santa of the Californians." It should be remarked here, that the shrub Mrs. Bingham refers to, is not the beautiful shrub with velvety foliage found around San Diego and referred to *E. tomentosum* by Watson. The San Diego shrub is referred to *E. crassifolium* Bentham (sive Greene), and is not known to possess any medicinal properties. The Yerba Santa of the Mexicans commonly referred to as possessing medical properties, is *E. glutinosum*.

Genus HESPEROCHIRON S. Watson.

HESPEROCHIRON NANUS Greene.

BORRAGINACEAE.

Genus COLDENIA Linnaeus.

COLDENIA CANESCENS D. C.

COLDENIA PALMERI A. Gray.

Genus HELIOTROPIUM Tournefort.

HELIOTROPIUM CURASSAVICUM Ljn.

Genus AMSINCKIA Lehm.

AM SINCKIA ECHINATA A. Gray.

A. lycopsoides Lehm da 12

AM SINCKIA INTERMEDIA F. & M.

Fl chrome y, with orange spots at the base of the divisions of the corolla. sz j

AM SINCKIA TESSELLATA A. Gray.

AM SINCKIA SPECTABILIS F. & M.

PLAGIOBOTHRYS CANESCENS A. G.

PLAGIOBOTHRYS NOTHOFULVUS

KRYNITZKIA ANGSTIFOLIA A. Gray

KRYNITZKIA BARRIGERA A. Gray.

KRYNITZKIA CIRCUMSCISSA A. Gray.

KRYNITZKIA COOPERI A. Gray.

KRYNITZKIA FOLIOSA Greene.

KRYNITZKIA INTERMEDIA A. Gray.

KRYNITZKIA JONESII A. Gray.

KRYNITZKIA LEOCARPA F. & M.

KRYNITZKIA MARITIMA Greene.

KRYNITZKIA MICROMERIS A. Gray.

KRYNITZKIA MOHAVENSIS Greene.

KRYNITZKIA MURICATA A. Gray.

KRYNITZKIA OXYCARYA A. Gray.

KRYNITZKIA OXYGONA A. Gray.

KRYNITZKIA PTEROCARYA A. Gray.

KRYNITZKIA RAMOISSIMA A. Gray.

KRYNITZKIA TORREYANUM A. Gray.

Genus PECTOCARYA De Candolle.

PECTOCARYA LINEARIS D. C.

PECTOCARYA PENICILLATA A. D. C.

PECTOCARYA SETOSA A. Gray.

Genus HARPAGONELLA A. Gray.

HARPAGONELLA PALMERI A. Gray.

ECHINOSPERMUM GREENEI A. Gray.

CONVOLVULACEAE.

Genus CONVULVULUS Linnaeus.

CONVOLVULUS ARVENSIS Linn.

CONVOLVULUS CALIFORNICA Choisy.

CONVOLVULUS LONGIPES S. Watson.

CONVOLVULUS LUTEOLUS A. Gray.

CONVOLVULUS OCCIDENTALIS Gray

CONVOLVULUS PENTAPETALOIDES

CONVOLVULUS SEPIUM Linn.

CONVOLVULUS SOLDANELLA Linn.

Genus CRESSA Linnaeus.

CRESSA CRETICA Linn.

Genus CUSCUTA Tournefort.

CUSCUTA CALIFORNICA Choisy.

CUSCUTA DECORA CHOISY.

CUSCUTA SALINA Engelm.

CUSCUTA SUBINCLUSA D. & H.

DICHONDRA REPENS Forst.

SOLANACEAE.

Genus SOLANUM Tournefort.

SOLANUM DOUGLASSII Dunal.

SOLANUM NIGRUM Linn.

SOLANUM PALMERI Vasey & Rose.

SOLANUM XANTI A. Gray.

Genus PHYSALIS Linnaeus.

PHYSALIS AEQUATA Jacq. f.

PHYSALIS CRABOIFOLIA Benth.

PHYSALIS MURICULATA Greene.

PHYSALIS PEDUNCULATA Greene.

PHYSALIS PUBESCENS Linn.

Genus LYCIUM Linnaeus.

LYCIUM ANDERSONII A. Gray.

LYCIUM CALIFORNICUM Nutt.

LYCIUM HASSEI Greene.

LYCIUM PUBERULUM A. Gray.

LYCIUM RICHII A. Gray.

LYCIUM TORREYI A. Gray.

Genus DATURA Linnaeus.

DATURA METELOIDES DC.

D discolor Or 2190 j

Genus **PETUNIA Juss.**

P parviflora Juss j, da 12

Genus **NICOTIANA Tournefort**

NICOTIANA BIGELOVII S. Watson.

N trigonophylla Dunal Or e

N attenuata Torrey

NICOTIANA CLEVELANDI A. Gray.

Nicotiana Glauca L.—"The large, glaucous, thickish leaves are used as healing and anodine poultices." (Harvard).

SCROPHULARIACEAE.

Genus **LINARIA Tournefort.**

LINARIA CANADENSIS Dum.

Genus **ANTIRRHINUM Tournefort.**

ANTIRRHINUM COULTERIANUM Bth.

ANTIRRHINUM FILIPES A. Gray.

ANTIRRHINUM GLANDULOSUM Lnl.

ANTIRRHINUM JUNCEUM A. Gray.

ANTIRRHINUM NEVINIANUM A. Gray

ANTIRRHINUM NUTTALLIANUM Bth.

ANTIRRHINUM ORCUTTIANUM A. G.

ANTIRRHINUM SPECIOSUM A. Gray.

ANTIRRHINUM STRICTUM A. Gray.

Or d, da 12. Ge ca ac b 1:122. 409; Sz.

ANTIRRHINUM SUBSESSILE A. Gray

ANTIRRHINUM WATSONI Vasey-Rose

Genus **MOHAVEA A. Gray.**

MOHAVEA VISCIDA A. Gray.

Genus **SCROPHULARIA Tournefort.**

SCROPHULARIA CALIFORNICA Chn.

Genus **COLLINSIA Nuttall.**

COLLINSIA BARTSIAEFOLIA Benth.

C childsii Py da 12

C parviflora Or d

COLLINSIA BICOLOR Benth.

Auricula-p fls, upper divisions of corolla white tinged with rose & auricula-p spots at the center. Or d j

COLLINSIA PARRYI A. Gray.

Genus **PENTSTEMON Mitchell.**

PENTSTEMON AMBIGUUS Torr.

PENTSTEMON ANTIRRHINOIDES Bh.

P azureus Benth da 13

PENTSTEMON BARBATUS Nutt.

V labrosus G da 13

P caesus G

PENTSTEMON CENTRANTHIFOLIUS

PENTSTEMON CERROSENSIS Kelg.

PENTSTEMON CLEVELANDI A. Gray

PENTSTEMON CORDIFOLIUS Benth.

PENTSTEMON EATONI A. Gray.

PENTSTEMON GLABER Pursh.

PENTSTEMON HETEROPHYLLUS Lm.

P laetus G da 13

PENTSTEMON PALMERI A. Gray.

PENTSTEMON PARISHII A. Gray.

PENTSTEMON PARRYI A. Gray.

PENTSTEMON PUMILUS Nutt.

PENTSTEMON ROTHROCKII Gray.

PENTSTEMON SPECTABILIS Thurber

PENTSTEMON TERNATUS Torr.

Genus **PEDICULARIS Tournefort.**

PEDICULARIS DENSIFLORA Benth.

Lousewort, pomegranate-p fls & bracts with v lips. Or d

PEDICULARIS SEMIBARBATUS A. G.

MIMETANTHA PILOSA Greene.

Genus **MIMULUS Linnaeus.**

MIMULUS BREVIPES Benth.

M bigelovii G da 13

MIMULUS CARDINALIS Dougl.

MIMULUS EXIGUUS A. Gray.

MIMULUS FLORIBUNDUS Dougl.

MIMULUS FREMONTI A. Gray.

MIMULUS INCONSPICUUS A. Gray.

MIMULUS LATIFOLIUS A. Gray.

MIMULUS LUTEUS Linn.

MIMULUS MOHAVEENSIS Lemmon.

MIMULUS MOSCHATUS Dougl.

MIMULUS NANUS Hook & Arn.

MIMULUS NASUTUS Greene.

MIMULUS PALMERI A. Gray.

MIMULUS PARISHII Greene.

"Stout, 2' high, villous and very slimy; leaves ovate-lanceolate, erose-dentate 1-2' long, the uppermost clasping; pedicels shorter than the leaves; calyx-teeth triangular, acute, nearly equal; corolla pale rose-red, only the small, nearly regular limb exerted from the calyx; seed small oblong, with a loose, wrinkled coat."—

(Greene, Bull. Cal. Acad. Sci., 1. 108-9 (Mar. 7, 1885).

DIPLACUS GLUTINOSUS Nutt.

Mimulus glutinosus Wendl.—The infusion of the leaves of this and related forms (treated as species of Diplacus by some botanists) is considered a specific by some for dysentery.

DIPLACUS GRANDIFLORUS Greene.

DIPLACUS LATIFOLIUS Nutt.

DIPLACUS LINEARIS Greene.

DIPLACUS LONGIFLORUS Nutt.

DIPLACUS PUNICEUS Nutt.

DIPLACUS STELLATUS Kellogg.

Genus **STEMODIA Linnaeus.**

STEMODIA DURANTIFOLIA Swartz.

Genus **LIMOSELLA Linnaeus.**

LIMOSELLA AQUATICA Linn.

Genus **VERONICA Linnaeus.**

VERONICA ALPINA Linn.

VERONICA AMERICANA Schw.

VERONICA PEREGRINA Linn.

Genus CASTILLEIA Linnaeus.

- C cinerea G
 C sessiliflora Pursh
 CASTILLEIA AFFINIS Hook & Arn.
 Tips of floral bracts brilliant poppy-red.
 ff'j sz da 13
 CASTILLEIA FOLIOLOSA Hook.-Arn.
 CASTILLEIA HOLOLEUCA Greene.
 CASTILLEIA LINEARIFOLIA Benth.
 CASTILLEIA MINIATA Dougl.
 CASTILLEIA OBLONGIFOLIA A. Gray.
 CASTILLEIA PARVIFOLIA Bong.
 CASTILLEIA PLAGIOTOMA A. Gray.
 CASTILLEIA STENANTHA A. Gray.

Genus ORTHOCARPUS Nuttall.

- ORTHOCAPIUS ATTENUATUS A. Gray.
 O densiflorus Bentham Ce ca ac b 2:
 409 sz
 ORTHOCARPUS HISPIDUS Benth.
 ORTHOCARPUS PARISHII A. Gray.
 ORTHOCARPUS PURPURASCENS Bh.

Genus CORDYLANTHUS Nuttall.

- CORDYLANTHUS FILIFOLIUS Nutt.
 CORDYLANTHUS NEVINI A. Gray.
 CORDYLANTHUS MARITIMUS Nutt.
 da 14, ff

- Adenostegia maritima Nutt in DC pd
 10:598; KBr Zoe 2:368
 CORDYLANTHUS ORCUTTIANUS A. G.

OROBANCHACEAE.**Genus APHYLLON** Mitchell.

- APHYLLON CALIFORNICUM A. Gray.
 APHYLLON COMOSUM A. Gray.
 APHYLLON COOPERI A. Gray.
 APHYLLON FASCICULATUM A. Gray.
 APHYLLON LUDOVICIANUM A. Gray.
 APHYLLON TUEROSUM A. Gray.
 APHYLLON UNIFLORUM A. Gray.

BIGNONIACEAE.

- MARTYNYIA ALTHEAEFOLIA Benth.

Genus CHILOPSIS Don.

- CHILOPSIS SALIGNA Don.
 Chilopsis Saligua Don.—Desert willow. "Mexicans use the flowers in fevers and as a stimulant in cardiac diseases." (Harvard).

ACANTHACEAE.**Genus BELEPERONE** Nees.

- BELEPERONE CALIFORNICA Benth.

LABIATAE.**Genus HYPTIS** Jacq.

- HYPTIS EMORYI Torr.

Genus MENTHA Linnaeus.

- MENTHA CANADENSIS Linn.
 M piperata L da 14
 MENTHA VIRIDIS Linn.
 LYCOPUS SINUATUS Ell.
 L lucidus americanus G da 14

Genus PYCNANTHEMUM Mich.

- PYCNANTHEMUM CALIFORNICUM T.

Genus MONARDELLA Bentham.

- MONARDELLA CANDICANS Benth.
 MONARDELLA HYPOLEUCA A. Gray.
 MONARDELLA LANCEOLATA A. Gray.
 V tenuiflora G
 MONARDELLA LINOIDES Gray.
 MONARDELLA MACRATHA A. Gray.
 V tenuiflora G
 MONARDELLA NANA A. Gray.
 MONARDELLA ODORATISSIMA Benth
 MONARDELLA PRINGLEI A. Gray.
 MONARDELLA TENUIFLORA S. Wat.
 MONARDELLA THYMIFOLIA Greene.
 MONARDELLA VILLOSA Benth.

- CALAMINTHA PALMERI A. Gray.
 ACANTHOMINTHA ILICIFOLIA A. G.

Genus POGOYNE Bentham.

- POGOYNE NUDIUSCULA A. Gray.
 POGOYNE SERPYLLOIDES A. Gray.
 POGOYNE TENUIFLORA A. Gray.

Genus SALVIA Linnaeus.

- S bernardina Paris; G- ca ac b 1:211 b
 SALVIA COLUMBARIÆ Benth.
 Salvia Columbariæ Bentham.—Mrs. Bingham says this is "the chia of the aborigines, and grows in soil in the foothills of the coast range. The seeds are demulcent, and used in gastro-intestinal disorders. The Indians roasted the seed, ground them between two stones, and used the meal for food. It is said to improve the taste of poor water, and on that account is of use to persons in crossing deserts. It quenches thirst and lessens the quantity of water desired, sometimes in that way preventing serious illness from excessive drinking of bad water. It is valued as a poultice, and the seeds are sometimes placed in the eye to form a muclage by means of which foreign bodies may be removed from that organ. Quantities of these seeds have been found buried in graves several hundred years old, proving that the use of the seed reaches back into the remote past."

Prof. Sereno Watson (Bot. Cal. 1:599) says, "The seed-like nutlets, infused in water, form a pleasant mucilaginous drink, which is largely used."

SALVIA CARDUACEA Benth.
Salvia Carduacea Bentham—The seed of this and the above species are identical except in size, and both known by the Indian name of "chia," "chio," or "chius." As the seed of this is much larger it is the one most largely used among the Indians of Southern and Lower California, and the above remarks of Mrs. Bingham concerning *S. columbariae* may be considered to apply equally well to this species.

SALVIA CEDROSENSIS Greene.

Genus **SPHACELE** Bentham.

SPHACELE CALYCINA Benth.

V wallacci G da 14

S fragrans Ge pit 1:38; ca ac b 2:409 sz

Genus **AUDIBERTIA** Bentham.

AUDIBERTIA CAPITATA A. Gray.

AUDIBERTIA CLEVELANDI A. Gray.

AUDIBERTIA GRANDIFLORA Benth.

AUDIBERTIA INCANA Benth.

V pilosa G

V pachystachya G j

AUDIBERTIA NIVEA Benth.

AUDIBERTIA PALMERI A. Gray.

AUDIBERTIA POLYSTACHYA Benth.

AUDIBERTIA STACHYOIDES Benth.

A Vaseyi Porter

SALIZARIA MEXICANA Torr.

Micromeria Douglasii Bentham.-- "Yerba Buena." Valued as a blood purifier.

BRUNELLA VULGARIS Linn.

TEUCRIUM CUBENSE Linn.

Genus **MARRUBIUM** Linnaeus.

MARRUBIUM VULGARE Linn.

Marrubium vulgare L.—Hoarhound, widely naturalized in California, is much used for coughs and lung diseases.

Genus **STACHYS** Linnaeus.

STACHYS ACUMINATA Greene.

S adjugoides Bentham da 14

S albens G da 14

STACHYS BULLATA Benth.

S californica Bentham da 14

Genus **TRICHOSTEMA** Linnaeus.

TRICHOSTEMA LANATUM Benth.

The black sage is a small shrub found in the coast range from Monterey

southward to Baja California(?), "cultivated in gardens of the Californians," and "valued as a stimulant" (Mrs. Bingham).

TRICHOSTEMA LANCEOLATUM Bth.

TRICHOSTEMA MICRANTHUM A. Gray.

TRICHOSTEMA OVATUM Curran.

TRICHOSTEMA PARISHII Vasey.

"Tomelo" of the Mexicans is valued for medicinal properties unknown to the writer. Dr. Edward Palmer, I believe, has published notes on the virtues of this plant in the American Naturalist, and also under the title of "Food Products," in one of the reports of the United States department of agriculture.

LOPHANTHUS URTICIFOLIUS Benth.

Genus **SCUTELLARIA** Linnaeus.

SCUTELLARIA ANGUSTIFOLIA Psh.

SCUTELLARIA BOLANDERI A. Gray.

SCUTELLARIA TUBEROSA Benth.

VERBENACEAE.

Genus **VERBENA** Linnaeus.

Verbena bracteosa Mich da 13

VERBENA CANESCENS H. B. K.

VERBENA CILIATA Benth.

VERBENA LILACINA Greene.

VERBENA LITTORALIS H. B. K.

VERBENA OFFICINALIS Linn.

VERBENA POLYSTACHYA H. B. K.

VERBENA PROSTRATA R. Br.

Genus **LIPPIA** Linnaeus.

LIPPIA LANCEOLATA Michx.

LIPPIA NODIFLORA Michx.

PLANTAGINACEAE.

Genus **PLANTAGO** Linnaeus.

PLANTAGO BIGELOVII A. Gray.

PLANTAGO HIRTELLA H. B. K.

PLANTAGO LANCEOLATA Linn.

PLANTAGO MAJOR Linn.

P maritima L ff

PLANTAGO PATAGONICA Jacq.

V gnaphaloides G Ore

PLANTAGO VIRGINICA Linn.

NYCTAGINACEAE.

Genus **MIRABILIS** Linnaeus.

MIRABILIS CALIFORNICA A. Gray.

MIRABILIS FROEBELII Behr.

MIRABILIS LAEVIS Curran.

MIRABILIS MULTIFLORA A. Gray.

Is M frebélii

MIRABILIS TENUILOBA S. Watson.

Genus **ALLIONIA** Linnaeus.

ALLIONIA INCARNATA Linn.

Genus **ABRONIA** Jussieu.**ABRONIA LATIFOLIA** Esch.

A arenari Menzies

ABRONIA MARITIMA Nutt.**ABRONIA TURBINATA** Torr.**ABRONIA UMBELLATA** Lam.**ABRONIA VILLOSA** S. Watson.

"Pubescence more or less densely villous, subglandular, spreading; stems weak and slender; leaves $\frac{1}{4}$ -1' long, oblong or ovate, obtuse or acutish, attenuate into a slender petiole; heads 5-10-flowered; involucre scales narrowly lanceolate, log-accumbent, 3-4" long; fl. pink, the lobes obcordate with a deep sinus; fr. with a firm body, strongly reticulate-pitted, the 3-5 broad wings consisting of a simple lamina, usually truncate above. Nearest to *A. umbellata*, Arizona (Wheeler)."—S. Watson, Amer. Natl., vii. 6 (May 1873).

OXYBAPHUS NYCTAGINEUS Sweet.Genus **BOERHAAVIA** Linnaeus.**B erecta** L. Or 2090 j**BOERHAAVIA VISCOSA** A. Gray.**POLYGONACEAE.**Genus **RUMEX** Linnaeus.**R acetosella** L. ff da 14**RUMEX CONGLOMERATUS** Mun.**RUMEX CRISPUS** Linn.**RUMEX HYMENOSEPALUS** Torr.

"Sandy soils from El Paso to the canyons of the Rio Grande; Mr—Ap. Root white. Stem 2-3° high. Foliage intensely bitter; Thurber. Lower leaves a ft or more long & 2-3' wide, somewhat undulate on the margin; upper ones nearly flat. Panicle a ft long, fls crowded. Inner sepals of the fructiferous calyx nearly $\frac{1}{2}$ ' long, roundish-ovate, strongly cordate, of a very thin texture, often rose-colored, slightly reticulate-veined, twice as long as the achenium" *** Torr bot m boundary 177-8. Or 71 j; d; z; da 14

RUMEX MARITIMUS Linn.**RUMEX SALICIFOLIUS** Weln.Genus **POLYGONUM** Linnaeus.**P acre** HBK da 14**POLYGONUM AMPHIBIUM** Linn.**POLYGONUM AVICULARE** Linn.**POLYGONUM BISTORTA** Linn.**POLYGONUM HARTWRIGHTII** A. G.**POLYGONUM HYDROPIPEROIDES** Mx.**P incurvatum** Ell da 14**POLYGONUM NODOSUM** Pers.**POLYGONUM TENUE** Michx.Genus **NEMACAULIS** Nuttall.**NEMACAULIS DENUDATA** Nutt.Genus **ERIOGONUM** Michx.**ERIOGONUM CLAVATUM** Small.

"Annual, acaulescent. Leaves basal; blades 5-13 mm. broad, much broader than long, undulate, strigose-hispid on both sides, cordate at the base or rarely truncate; petioles about twice as long as the blades, hispid; scapes erect, solitary, glaucous, forked above, the ultimate division filiform, the lower internodes more or less swollen above the middle; bracts scale-like; peduncles hair-like, $\frac{1}{2}$ cm. long, spreading; involucre narrowly turbinate, very small, less than 1 mm. long; segments obtuse, as broad as long, shorter than the tube; calices densely hirsute less than 1 mm. long, the segments nearly equal, ovate-lanceolate, acutish; filaments glabrous."—Small. j **ERIOGONUM GLAUCUM** Small.

"Annual, slender, acaulescent. Leaves basal; blades ovate or oval-ovate, 5-10 mm long, obtuse, undulate-crested, often inequilateral, softly hispid on both surfaces, obtuse or subcordate at the base; petioles 2-3 times longer than the blades, hirsute; scapes erect, solitary or several together, 1-6 cm tall, glaucous, forked, the branches ascending or spreading; peduncles filiform, about one cm. long, more or less spreading; involucre glabrous, turbinate, 1 mm. long; segments oblong, obtuse, about as long as the tube; calices densely hirsute, 2 mm. long; segments lanceolate, acute, erect; filaments glabrous."—Small, Bull. Torr. club, xxv, 51, Ja. 25, 1898. e

E latifolium Smith da 14; ff**E virgatum** Bentham da 15**E delicatulum** Wat da 15**E molestum** Watson da 15**E insigne** Watson Or 1466**E grande** Ge pitt 1:38; ca ac b 2:410 sz**E rubescens** Ge pit 1:39; ca ac b 2:410; sz**ERIOGONUM ANGULOSUM** Benth.**ERIOGONUM APICULATUM** S. Watson.

ERIOGONUM ARBORESCENS Greene.
ERIOGONUM BAILEYI S. Watson.
ERIOGONUM BRACHYPODUM T. & G.
ERIOGONUM CINEREUM Benth.
ERIOGONUM CRENULATUM Parry.

ERIOGONUM DESERTI (COLA S. W. ts.
 "Apparently an annual of the E. Pusillum group (base and foliage unknown) tall, several times dichotomously branched, white-tomentose, becoming mostly glabrous and yellowish green; bracts all small and deltoid; involucre shortly pedicellate or subsessile toward the end of the branches, erect or spreading, turbinate-campanulate, 1" long; perianth villous, the elliptical segments y. with greenish or reddish midveins, 1-1 1/2" long. In the southwestern part of the Colorado desert, San Diego Co., California; C. R. Orcutt, November, 1890 (n. 2189)."—S. Watson, Proc. Am. Acad. xxvi. 125-6 (July 31, 1891).

ERIOGONUM ELONGATUM Benth.
ERIOGONUM FASCICULATUM Benth.

ERIOGONUM FOLIOSUM S. Watson.
 "Of the E. vimineum group; annual, branching from the base, floccose-tomentose, the branches sparse and spreading; leaves ovate, cordate or cuneate at base, obtuse or acute, undulate, tomentose beneath, 3-9" long besides the petiole, radical, and in the axils of the subulate bracts; involucre broadly turbinate, cleft nearly to the middle, green, 1" long; fl. 1/2" long, the segments white or pinkish with a green midvein."—S. Watson, Proc. Am. Acad., xx. 371-2 (Feb. 21, 1885). Cantillas, Lower California (Palmer, 1875; Orcutt, 1882).

ERIOGONUM GIGANTEUM S. Watson.
ERIOGONUM GRACILE Benth.
ERIOGONUM INFLATUM Torr.

ERIOGONUM MINUTIFLORUM Wats.
 "Of the E. Pusillum group; very slender, 6" high or less, diffusely branching, glabrous, excepting the small ovate rosulate leaves which are densely white-tomentose on both sides, becoming less tomentose above; bracts minute; peduncles filiform, divaricately spreading; 3-8" long; involucre very small (1-3" long), broadly turbinate-campanulate, purplish; perianth y., minutely puberulent, very small."—S. Watson, Proc. Am. Acad., xxvi. 125 (July 31, 1891). Colorado desert, San Diego Co., California (Orcutt, April, 1890).

ERIOGONUM NUDUM Dougl.

ERIOGONUM ORCUTTIANUM S. Wats.
 "Of the E. Heermannii group; the very short herbaceous leaf stems from a woody base, and the rigid divaricate branches finely subtomentose-pubescent; leaves scattered, thick, nearly glabrous, broadly ovate or obovate, obtuse, shortly petiolate, 3/4" long; bracts ternate, deltoid-subulate, small, subherbaceous; involucre solitary, turbinate-campanulate, subtomentose, nearly 1" long; fl. tomentose, greenish white, 2-3" long, the oblong-obovate lobes of the perianth nearly equal."—S. Watson, Proc. Am. Acad., xx. 371 (Feb. 21, 1885). Shrub, 2' high; Cantillas Canyon, Lower California (H. C. and C. R. Orcutt, August, 1883).

ERIOGONUM PALMERI S. Watson.
ERIOGONUM PARIISHII S. Watson.
ERIOGONUM PARRYI A. Gray.
ERIOGONUM PARVIFOLIUM Smith.
ERIOGONUM PLUMATELLA D. & H.
ERIOGONUM PONDII Greene.
ERIOGONUM PUSILLUM T. & G.
ERIOGONUM RENIFORME Torr.
ERIOGONUM SAXATILE S. Watson.
ERIOGONUM STELLATUM Benth.
ERIOGONUM THOMASII Torr.

ERIOGONUM THURBERI Torr.

"Sandy ravines, San Pasqual, Calif., My; Thurber. * * Wallace. Leaves in a subradical cluster, about 1/2' long undulate-rugose pubescent above, white-tomentose underneath. Stem a scape about a span high, trichotomously subdivided below the middle, with ovate acute ternate bracts at the forks. Pedicels 1' long. Involucre less than a line in diameter, cleft nearly to the middle into 6 rather obtuse lobes; exterior segments of the perianth nearly four times broader than the inner. Filaments a ovary smooth. Styles short. Achenium smooth. Embryo strongly curved. No bracteoles were detected; in their place are only woolly hairs." * * * Torr bot m boundary 176-7 Or j; da 14

ERIOGONUM NODOSUM small.

"A white-tomentose shrub, .5-1.5 meters tall, with spreading, forking branches. Leaves small, 2-6 mm. long; blades elliptic or elliptic-ovate, acutish, revolute, narrowed into short petioles; bracts scale-like, acute or acuminate; involucre turbinate-campanulate, 2.5 mm. long, angled, sessile; segments broad, much shorter than the tube; calices glabrous, pink, 3 mm. long; segments rounded at the apex, the 3 outer oblong or obovate-oblong, the 3 inner cuneate; filaments villous below the middle; achenes 3-angled, scabro-pubescent above the middle."—Small, Bull. Torr. club, xxv. 49. Ja 25 1898. e

ERIOGONUM TRICHOPODUM Torr.
ERIOGONUM UMBELLATUM Torr.
ERIOGONUM VIMINEUM Dougl.
ERIOGONUM WRIGHTII Torr.

Genus **CHORIZANTHE** R. Brown..

CHORIZANTHE BREVICORNU Torr.
 CHORIZANTHE CALIFORNICA A. G.
 CHORIZANTHE CORRIGATA T. & G.
 CHORIZANTHE FERNANDINA S. Wat.
 CHORIZANTHE FIMBRIATA Nutt.
 CHORIZANTHE LACINIATA Torr.
 CHORIZANTHE LEPTOCEROS S. Wat.

CHORIZANTHE ORCUTTIANA Parry.
 "Decumbent, 2-6' broad, appressed pubescent throughout, densely branched from the base; radical leaves narrowly lanceolate, obtuse, tapering to a slender petiole; cauline leaves smaller, sessile, opposite, connate, obtuse; upper involucre bracts broadly triangular, scarious, acuminate; involucre in the lower forks and loosely scattered on the slender branches, sharply triangular, with short chartaceous tube (not corrugated); divisions 3, nearly equal, not conspicuously foliaceous, broadly divergent, with recurved uncinata awns; fl. partly exsert, pedicellate; perianth as long as the pedicel, tube narrowly turbinate, segments equal, narrowly spatulate, with long ciliate hairs externally, extending beyond the segments in an irregular fringe; stamens 3 (or less), with short filaments on the throat; anthers dull reddish, orbicular; stigmas short, recurved; akene narrowly triangular; embryo 1" in length, with linear cotyledons and slender radicle."—Parry, Proc. Dav. Acad. Natl. Sci., iv. 54-5 (1884).

CHORIZANTHE PARRYI S. Watson.
 CHORIZANTHE PERFOLIATA A. Gray.
 CHORIZANTHE POLYGONOIDES T. & G.
 CHORIZANTHE PROCUMBENS Nutt.
 CHORIZANTHE RIGIDA T. & G.
 CHORIZANTHE SPINOSA S. Watson.
 CHORIZANTHE STATICOIDES Benth.
 CHORIZANTHE THURBERI S. Watson.
 CHORIZANTHE WATSONI T. & G.
 CHORIZANTHE XANTHI S. Watson.

Genus OXYTHECA Nuttall.

OXYTHECA CARYOPHYLLOIDES Pry.
 OXYTHECA INERMIS S. Watson.
 OXYTHECA LUTEOLA Parry.
 OXYTHECA PARISHII Parry.
 OXYTHECA PERFOLIATA T. & G.
 OXYTHECA TRILOBATA A. Gray.

Genus LASTARRIAEA Remy.

LASTARRIAEA CHILENSIS Remy.
 "Involucral whorls closely adherent, perianth similar to the external cauline; fl. 5; perianth sharply triangular, coriaceous, segments unequal, with prolonged uncinata awns."—Parry, Proc. Dav. Acad. Natl. Sci., v. 36 (Nov. 1, 1886).

Genus HARFORDIA Parry.

HARFORDIA FRUTICOSA Greene.
 HARFORDIA MACROPTERA Parry.

Genus PTEROSTEGIA F. & M.

PTEROSTEGIA DRYMARIOIDES Nutt.

AMARANTACEAE.

Genus AMARANTUS Tournefort.

AMARANTUS ALBUS Linn.
 AMARANTUS CALIFORNICUS S. Wat.

AMARANTUS FIMBRIATUS Benth.
 AMARANTUS PALMERI S. Watson.
 AMARANTUS REFLEXUS Linn.

Genus NITROPHILA S. Watson.
 NITROPHILA OCCIDENTALIS S. Wat.

Genus CLADOTHRIX Nuttall.
 CLADOTHRIX LANUGINOSA Nutt.
 CLADOTHRIX OBLONGIFOLIA Nutt

CHENAFODIACEAE.

Genus APHANISMA Nuttall.

APHANISMA BLITOIDES Nutt.

Genus CHENOPODIUM Tournefort.
 CHENOPODIUM ALBUM Linn.

CHENOPODIUM AMBROSIOIDES Linn.
 "Chenopodium Ambrosioides L.—"A common weed in many parts of the world, is used as a vermifuge under the name of worm seed." (Mrs. Bingham).

CHENOPODIUM CALIFORNICUM S. W.
 CHENOPODIUM FREMONTI S. Watson
 CHENOPODIUM MURALE Linn.

Genus MONOLEPIS Schrader.

MONOLEPIS CHENOPODIOIDES Moq.
 MONOLEPIS SPATHULATA A. Gray.

Genus ATRIPLEX Tournefort.

ATRIPLEX BRACTEOSA S. Watson.
 ATRIPLEX CANESCENS James.
 ATRIPLEX COULTERI Dietr.
 ATRIPLEX DILATATA Greene.
 ATRIPLEX EXPANSA S. Watson.
 ATRIPLEX HYMENELYTRA S. Watson
 ATRIPLEX JULACEA S. Watson.
 ATRIPLEX LEUCOPHYLLA Dietr.
 ATRIPLEX MICROCARPA Dietr.
 ATRIPLEX ORBICULARIS S. Watson.
 ATRIPLEX PALMERI A. Gray.
 ATRIPLEX PARISHII S. Watson.
 ATRIPLEX PATULA Linn.

Genus EUROTIA Adanson.

EUROTIA LANATA Moq.
 Eurotia Lanata Moquin.—"Of good repute as a remedy for intermittents." (Watson, Bot. Cal. II. 56).

GRAYIA POLYGALOIDES Hook-Arn.

Genus SALICORNIA Tournefort.

SALICORNIA AMBIGUA Michx.
 SALICORNIA HERBACEA Linn.
 SPIROSTACHYS OCCIDENTALIS S. W.

Genus SUAEDA Forskal.

SUAEDA TORREYANA S. Watson.

BATIDEAE.

Genus BATIS P. Browne.

BATIS MARITIMA Linn.

LAURACEAE.

Genus UMBELLALARIA Nuttall.
 UMBELLULARIA CALIFORNICA Nutt.

URTICACEAE.

Genus URTICA Tournefort.
 URTICA HOLOSERICEA Nutt.
 URTICA URENS Linn.

Genus HESPEROCNIDE Torrey.
 HESPEROCNIDE TENELLA Torr.

Genus PARIETARIA Tournefort.
 PARIETARIA DEBILIS Forst.

PLATANACEAE.

Genus PLATANUS Tournefort.
 PLATANUS RACEMOSUS Nutt.
 The sycamore is a spreading, lofty tree common near water courses from the coast to the desert, up to an altitude of 3,000 or 4,000 feet. "A tree growing in sandy loam at San Bernardino measures 9½ feet in circumference at 3½ feet from the ground; height about 60 feet."—Parish, Zoe, 4:3.

BUXACEAE.

Genus SIMMONDSIA Nuttall.
 SIMMONDSIA CALIFORNICA Nutt.
 The goat-nut, or deer-nut, is an acorn-like fruit, edible and pleasant to the taste, produced by a low, oval-formed, rigid shrub, in profusion, under all conditions of soil from the sea coast to the borders of the desert to eastern Arizona. The Indians at the Catalina mission, in Lower California, claim not to eat them, and I find no record of their ever having been utilized for food. It occurs on Cedros Island, and the mainland opposite to the gulf shores.

EUPHORBIACEAE.

Genus EUPHORBIA Linnaeus.
 EUPHORBIA ALBOMARGINATA T.-G.
 EUPHORBIA ERIANTHA Benth.
 EUPHORBIA HIRTULA Engelm.
 EUPHORBIA MISERA Benth.
 EUPHORBIA PALMERI Engelm.
 EUPHORBIA PARISHII Greene.
 EUPHORBIA POLYCARPA Benth.
 Euphorbia Polycarpa Benth.—The name Golondrina is applied indiscriminately by Mexicans to various species of small prostrate herbs belonging to the genus Euphorbia, each of which is reputed to be a certain antidote against the bite of the rattlesnake or of any of the poisonous reptiles or insects. It is

popularly believed that wherever the rattlesnake may occur that some form of this rattlesnake weed may be found. Some form is sure to be found in any portion of the southwest, from California to Texas, southward into Mexico.

Indians are said to chew the plant when bitten by a snake, and swallowing the juice, stuff the cud into the wound or apply it as a poultice, or sometimes make a weak tea. Said also to be useful in cases of internal as well as of external poisoning, but I have found no evidence to sustain this statement, and as the plant is in itself poisonous to some people when the juice is externally applied to the skin, it should be handled with caution, except in dire necessity. It seemingly has no effect upon the writer.

A CURE FOR SNAKE BITES.
 steeped in milk and given to children in cases of their being bitten by a rattlesnake.

v micromera Millsp. Ore
 EUPHORBIA SERPYLLIFOLIA Pers.
 v co sanguinea Boiss Or d
 Elongleria Scheele. Or
 Epeodes Nutt Or
 Ediotosperma F.M Or
 Edentata Mx Or
 E heterophylla graminifolia E Or
 E buja californica Millsp. Or J181
 Escallona E Or
 Ewright IT-G Or
 EUPHORBIA SPLENDENS Boj.
 EUPHORBIA TOMENTULOSA S. Wat.

Genus EREMOCARPUS Benth.
 EREMOCARPUS SETIGERUS Benth.

Genus ACALYPHA Linnaeus.
 ACALYPHA CALIFORNICA Benth.

Genus CROTON Linnaeus.
 CROTON CALIFORNICUS Mull.
 CROTON TENUIS S. Watson.
 BERNARDIA MYRICAEFOLIA S. Wat.

Genus STILLINGIA Garden.
 STILLINGIA ANNUA Mull.
 STILLINGIA LINEARIFOLIA S. Wat.

Genus ARGYTHAMNIA P. Browne.
 ARGYTHAMNIA SERICOPHYLLA A. G.
 ARGYTHAMNIA SERRATA Mull.

Genus TETRACOCUS Engelmann.
TETRACOCUS DIOICUS Parry.

"Shrubby, dioecious; staminate flowers involucre on slender pedicels in the axils of the upper leaves of recent shoots; inflorescence with a prolonged central axis a little shorter than the leaves, and usually 2 or more unequally developed opposite branches, bracteate at base; involucre in a double series, persistent, with 7-9 short, rounded segments; stamens 7-9 long exsert, inserted at the base of the involucreal scales, encircling an irregularly lobed, central disk; filaments densely ciliate-pubescent at base, rather exserted, broadly 2-celled. Pistillate flowers in the axils of lower leaves on recent shoots, single pedicellate, pedicels thickening upwards, and bracteate near the middle involucre of 7-9 oblong, unequal segments in 2 series with 4 glandular scales on the inner surface, segments fragrant at maturity. Ovary 4 lobed, densely tomentose; style with 4 long, recurved stigmas. Capsule orbicular, broadly 4-lobed and 4-celled, the thin epicarp separating in valves from rigid coccol which part at maturity, the separate cells dehiscent at both sutures. Ovules 2 to each cell, pendant from the upper placental column which persists as a rigid central axis after the rupture of the cells. Seeds by abortion 1 to each cell, smooth, oblong, conspicuously carinate. Embryo with broad cotyledons and short, straight radicle immersed in copious albumen. Leaves narrowly lanceolate, nearly sessile with somewhat decurrent midrib, smooth; rather rigid and inclined to curve on the upper face, mostly opposite or in ternate whorles, often fasciculate in the lower axils, and with short reduced branches on the lower shoots."—Parry, West Am. Sci. L. B. 185.

RICINIS COMMUNIS Linn.

CALLITRICHACEAE.

Genus CALLITRICHÉ Linnæus.

CALLITRICHÉ LONGIPEDUNCULATA
CALLITRICHÉ VERNA Linn.

PIPERACEAE.

Genus ANEMOPSIS Hooker.

YERBA MANSE.

ANEMOPSIS CALIFORNICA B. & H. This is one of the favorite medicinal herbs of the old Spanish Californians, but has won a permanent place in European greenhouses, and should be given the attention it deserves in the land of its birth. It is readily grown in moist soil, the apple-green foliage, frequently blotched with crimson, showing off the rather large white flowers to great advantage.

Anemopsis Californica Benth. & Hook.—The "Yerba Manse" of the

Mexicans has a "strongly pungent, astringent, aromatic root, valued for the healing of ulcers, both of the mucous membrane and of the outer surface" (Mrs. Bingham). Much used for medicinal purposes by the Indians and Mexicans (Watson, Bot. Cal. p. 78). Widely distributed over Southern and Lower California, in moist, salty ground.

CERATOPHYLLACEAE.

Genus CERATOPHYLLUM Linnæus.
CERATOPHYLLUM DEMERSUM Linn.

BETULACEAE.

Genus ALNUS Tournefort.

ALNUS OBLONGIFOLIA Torr.

The alder is a slender tree occurring along our perennial streams, from Mission valley to the Cuyamaca mountains in Lower California, and north and eastward. Rarely exceeds 50 feet in height and 2 feet in diameter.

ALNUS RHOMBIFOLIA Nutt.

SALICACEAE.

Genus SALIX Tournefort.

SALIX CAUDATA Muhl.
SALIX LAEVIGATA Bebb.
SALIX LASIANDRA Benth.
SALIX LASIOLEPIS Benth.
SALIX LONGIFOLIA Muhl.
SALIX SESSILIFOLIA Nutt.

Genus PÖPULUS Tournefort.

POPULUS TRICHOCARPA T. & G.

JUGLANDACEAE.

Genus JUGLANS Linnæus.

JUGLANS CALIFORNICA Watson. The California Black Walnut is a tree or large shrub, producing small nuts of an excellent flavor, preferred by some to the Madeira nut. A grand ornamental tree, attaining a height of 60 feet, or more, and could be advantageously grown in arid localities.

The California black walnut is usually a small tree, growing 50 to 75 feet high, 2 to 4 feet in diameter, bearing a roundish nut, the kernel sweet and delicate in flavor. Occurs from along the Sacramento river to San Diego county, California; occasionally cultivated, but more as a shade or street tree, than for its excellent nuts.

Genus CORYLUS Tournefort.

Crostrata Alty californica A DC

CUPULIFERAE.

Genus CASTANOPSIS Spach.

CASTANOPSIS CHRYSOPHYLLA A. DC
Genus **QUERCUS** Linnaeus.

Q. GRIFOLIA Nees.

The California live oak is justly one of the trees described as picturesque, the stout, low trunk 8, to even 20 feet, in circumference, with a spread of branches of 120 feet. Mendocino county appears to be its northern limit, while near La Grulla, south of Ensenada, Lower California, is the most southern recorded station, where its branches sweep the ground. The shining, elongated, tapering, acute-pointed acorn, 1-1½ inches long, and ¼ to 1-3 inch in diameter, characterizes the species and are among the treasured trophies of the average tourist, who often says he "can taste them still"—but generally prefers not to do so—the second time.

Q. ENGELMANNI Ge. [*Q. oblongifolia*]

The Englemann, or Post oak, is a small spreading tree, 40 feet high, with a trunk usually under 3 feet in diameter. Not rare near Pala, Fallbrook, the Potrero, and into Lower California, 20 miles or so from the sea. **QUERCUS CHRYSOLEPIS** Liebm. **QUERCUS DUMOSA** Nutt. **QUERCUS EMORYI** Torr. **QUERCUS KELLOGGII** Newb. **QUERCUS PALMERI** Engelm. **QUERCUS PUNGENS** Engelm.

LOBANTHACEAE.

Genus **ARCEUTHOBIUM** Bieb.

ARCEUTHOBIUM DOUGLASSII Engelm. **ARCEUTHOBIUM OCCIDENTALE** E.

Genus **PHORADENDRON** Nuttall.

PHORADENDRON BOLLEANUM Eichl. **PHORADENDRON CALIFORNICUM** Nutt. **PHORADENDRON FLAVESCENS** Nutt. **PHORADENDRON JUNIPERINUM** Em.

GNETACEAE.

Genus **EPHEDRA** Tournefort.

EPHEDRA CALIFORNICA S. Watson. Ephedra californica Watson.—"Cantilla" or Mountain tea, and "tepopote" (sive Havard), are names applied to several of the genus Ephedra. "They are popular remedies among Mexicans and frontiersmen in the treatment of syphilis and gonorrhoea, especially the latter. The decoction or infusion of the stems has an acid reaction and an astringent taste resembling that of tannin. It is used as an injection and internally; some caution should be ob-

served as it has been known to cause strangury." (S. V. Havard, vide Proc. U. S. Mus. VIII. 504.) The species *D. antisiphilitica*, *D. trifurca* Torr. seem to agree equally well to our Californian species. It is often used as a substitute for tea, and is scarcely distinguishable in taste, except for an after-flavor, but unpleasant, reminding one slightly of catnip tea. It is in great repute as a blood purifier and many have volunteered to me their opinion that it was "better than sarsaparilla" and without an equal. I have never heard of unpleasant effects following its use. It is a valuable sedative. Experiments and analyses prove it to be not superior to *E. antisiphilitica*—which already has a place among American drugs.

EPHEDRA NEVADENSIS S. Watson. **EPHEDRA OXYCARPA** Engelm. **EPHEDRA TRIFURCA** Torr.

CONIFERAE.

Genus **JUNIPERUS** Linnaeus.

JUNIPERUS CALIFORNICUS Carr.

Genus **LIBOCEDRUS** Endl.

L. decurrens Torr. white cedar.

Genus **PINUS** Tournefort.

P. MURICATA Don.

A small pine, growing near San Isidro, in Lower California, not known from San Diego county, is found, only near the coast, as far north as Mendocino—where it grows 50 to 80 or 120 feet high. At San Isidro trees only 3 feet high were perfecting cones, which are said to persist over 30 years on the tree. The leaves are in pairs. The cones are sessile, ovate, about 3 inches long, with stout prickles on the outside. The cones occurring in whorls around the stem, and remaining closed for many years, are one of the curiosities of California botany.

PINUS COULTERI Don. Big-cone pine.—the "cone elongated, elliptical, of matchless size and weight, 15 to 20 inches long, and often weighing 5 to 8 pounds."

The big cone pine is a tree 1-2½ feet in diameter and 50 or more feet high, occurring above 5,000 feet usually; from Mount Diablo to the Catalina mountain and on the mountains northeast of Ensenada in Lower California. The cones are long, oval pointed, 10-14 inches long and 4 or 5 inches in diame-

ter, yellowish brown, persistent. For many years on the tree, the scales with a very stout, long incurved point (sometimes 2 inches long.)

PINUS PONDEROSA Dougl. Western yellow pine. Trees of the largest size, 200 to 300 feet in height, and 5 to 15 feet thick.

The yellow pine is a noble tree, one of the largest known, 200-300 feet high and 12-15 feet in diameter at times, with leaves in threes, 5 to even 11 inches long. "Throughout the San Bernard no range, the San Jacinto and Cuyamaca mountains, forming the greater part of the coniferous forest," says Parish (*Zoe.*, 4:351.)

PINUS JEFFREYI Murr.

The Jeffrey or black pine is a tree 75 feet high, trunk 3 feet in diameter, usually found in the mountain valleys near small streams, extending into Lower California. Credited to the Cuyamaca mountain.

PINUS LAMBERTIANA Dougl. The Great Sugar pine, bearing immense cones.

The sugar pine attains at times a height of 300 feet and a diameter of 8 to 20 feet, with light brown smoothish bark, splitting in small sections. The bright brown cylindrical cones are 1 to 1½ feet long, 3-4 inches wide, on peduncles 3 inches in length, containing smooth, black seeds ½ inch long. "The exudation from the partially burned tree loses its resinous qualities and acquires a sweetness similar to that of sugar or manna, for which it is sometimes used, whence the name of sugar pine." (Watson, *Botany of California*, 2:123.) The sugar which I have collected from trees in the Cuyamaca mountains was very sweet, fine grained and white as snow.

PINUS MONOPHYLLA T. & G.

PINUS PARRYANA Engelm.

The pinone tree, peculiar to Southern and Lower California, but most abundant on the table lands near the international boundary, is a very graceful and symmetrical tree, 20-30 feet high, 10-18 inches in diameter, distinguished by the 3-5 (mostly 4) leaves in a sheath, 1¼-1½ inches long. The oval seeds, 5-8 lines long, with a thin light-brown mottled shell, are delicious in flavor, either roasted or fresh, and in a good season are collected in immense quantities by the Indians for food. These nuts in a roasted condition are not rare in San Diego markets, and often exported in quantities,

being considered quite a luxury with some. Unlike the other nut pines, the tree is very ornamental when properly grown, and forms a worthy monument to the botanist of the Mexican boundary survey of 1850—Dr. Charles Christopher Parry—in whose honor the specie is named.

PINUS RADIATA Don: (*P. insignis*, Loudon.) Monterey pine; a popular tree for California planting.

PINUS SABINIANA Dougl. Gray-leaf pine; one of the nut pines, or "Digger Pine," the large seeds of which were formerly used for productive. A vigorous grower, or more, the main stems often with a circumference of 50 feet."

PINUS TORREYANA Parry.

The Soledad pine was for many years believed an exclusive resident of the suburban parts of San Diego, occurring on the hills facing the sea near Del Mar. A second small grove has been discovered on Santa Rosa island. Where most exposed it forms a low, scraggly shrub, 2 or 3 feet high only at times, but spreading over a wide area; at its best estate it forms a small, graceful tree 20 to 30 feet high, a foot or more in diameter. The very stout leaves are 8 by 11 inches long, 5 in a sheath. The edible seeds, 8-11 lines long, with a very hard shell, produced in an ovate cone, 4-5 inches long and nearly as great diameter.

Genus *SEQUOIA* Endl.

SEQUOIA GIGANTEA Lindl & Gordon. The Giant Redwood, or "Big Tree" of California—the largest tree known in the world.

SEQUOIA SEMPERVIRENS Endl. Redwood, "one of the most colossal trees of the globe."

Genus *PSEUDOTSUGA* Carriere.

Pseudotsuga macrocarpa, so named by Prof Lemmon in the third Cal. For. report, 134, is a "rather irregular tree 150 feet high, 4 feet in trunk diameter. Bears light crops of cones, the reported fecundity perhaps exceptional." It was originally found between Banner and Julian, in San Diego county, where it forms one of the most beautiful of trees, perfect in symmetry and grace. It is nearly allied to the Douglas spruce of the north, and for many years treated as a variety—as it should probably still be treated.

Genus *ABIES* Link.

ABIES CONCOLOR Lindl.

ABIES BRACHYPHYLLA Maxim.

ABIES FIRMA Sieb & Zucc.

ABIES HOMOLEPIS Steb. & Zucc.
ABIES MARIESII Mast.
ABIES SACHALINENSIS Mast.
ABIES VEITCHII Lindl.

The last three are Japanese recommended for Cal.

Genus CUPRESSUS Tournefort.

The Californian species of cypress are among the most widely planted of evergreens, & are very ornamental. The Monterey cypress is much used for hedges; the Lawson cypress is a species of *Chamaecyparis*.

C GOVENIANA Gordon.

CUPRESSUS GUADALUPENSIS Watson
 The Guadalupe or blue cypress is a small tree with slender, light green, drooping branchlets; the bark, flaking off, leaves a claret-red surface to the limbs.

The blue cypress is a handsome, slender tree, 40 to possibly 60 feet high, with beautiful exfoliating reddish bark and glaucous foliage, first discovered on Guadalupe Island, and later found in rocky canyons near Ensenada, on the mainland. It proves not rare in some of the canyons near the international boundary, and Parish records it in "ravines near the Old Mission, San Diego, not abundant" (Zoe., 4:352). Its graceful habit and compact growth makes it one of the most ornamental species in the genus.

C. Lawsoniana—see *Chamaecyparis Lawsoniana*
CUPRESSUS MACROCARPA Hartweg, Monterey cypress, a familiar hedge-tree in California, cones the largest of the genus, about an inch thick.

Genus THUYA Tournefort.

Thuyagentea Nutt. arborescens not d.

Genus CHAMAECYPARIS Spnch.

Chamaoniana Parlat.

Genus TSUGA Carriere.

T. mertensiana Carr. Mt. Inyo, to Alaska

Genus PICEA Link.

P. sitchensis Carr. Mendocino to Alaska

TAXACEAE.

Genus TORREYA Arnott.

T. californica Torr. Canutmez not d.

Genus TAXUS Tournefort.

T. brevifolia Nutt. yew

ORCHIDACEAE.

Genus EPIPACTIS Haller.

EPIPACTIS GIGANTEA Dougl.

Genus CYPRIPEDIUM Linnaeus.

C. montanum Dougl.

Genus HABENARIA Willd.

HABENARIA COOPERI S. Watson.

H. elegans Bolander

H. unalaschensis Wat. da 17

HABERNARIA LEUCOSTACHYS S. W.

IRIDACEAE.

Genus SISYRINCHIUM Linnaeus.

SISYRINCHIUM BELLUM S. Watson.

S. californicum Ait. da 17

Genus IRIS Tournefort.

Imacrosiphon Torr. Or 1506 d.

AMARYLLIDACEAE.

Genus AGAVE Linnaeus.

AGAVE DESERTI Engelm.

The mesal of the desert, glaucous foliage.

AGAVE MARGARITAE Brandege. A recent introduction from the islands off Lower California, and one of the handsomest of the smaller growing agaves.

AGAVE HORRIDA Lem.

AGAVE LECHEGUILLA Torr.

AGAVE MICRACANTHA Salm-Dyck.

AGAVE PALMERI Engelm. A very symmetrical species, found in the mountains of Southern Arizona.

AGAVE PARRYI Engelm.

AGAVE PRINGLEI Engelm.

AGAVE SHAWII Engelm. Very compact, dark olive-green leaves, margined with stout spines. Peculiar to the coast region of Southern and Lower California.

AGAVE STRIATA Zucc.

AGAVE UNIVITTATA Haw.

AGAVE UTAHENSIS Engelm.

AGAVE VICTORIAE-REGINAE T. Mrs.

AGAVE XYLONACANTHA Salm-Dyck.

LILIACEAE.

BEHRIA TENUIFLORA Greene. Grassy leaves about a foot long; flowers tubular, borne in an umbel, the stamens much exserted, brilliant scarlet in color, reminding one somewhat of *Brevortia* *Ida-Mala*. A Mexican bulb nearly allied to *Bessera elegans*.

Genus ALLIUM Linnaeus.

ALLIUM ACUMINATUM Hook.

ALLIUM ATTENUIFOLIUM Kellogg.

ALLIUM CRISPUM Greene.

ALLIUM DICHLAMYDEUM Greene.

ALLIUM FIMBRIATUM S. Watson.

ALLIUM HAEMATOCHEITON Watson.

The mesas and hills around San Diego are decked in springtime with the clusters of bright purplish-tinted flowers of this wild onion, which deserves a prettier name at the hands of its friends. It does not prove quite hardy in New England, but will give enough pleasure for the cost of growing in the house among its more showy cousins.

ALLIUM LACUNOSUM S. Watson.

ALLIUM PARVUM Kellogg.

ALLIUM PENINSULARE Lemmon.

ALLIUM SERRATUM S. Watson.

ALLIUM UNIFOLIUM Kellogg.

Genus MULLA S. Watson.

MULLA CORONATA Greene.

MULLA MARITIMA S. Watson.

Ord J [et v—da 17

Genus CALOCHORTUS Pursh.

CALOCHORTUS APICULATUS Bak.

CALOCHORTUS ALBUS Dougl.

CALOCHORTUS AUREUS S. Watson.

"Low, 4-6" high, with a single linear

Established 1884.

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VOLUME X.

April, 1901.

NUMBER 100.

THE

—*West* American *Scientist*—

A popular monthly review and record for the Pacific Coast.

Official organ San Diego Society of Natural History.

Established 1884.

CONTENTS:

Medicinal plants	33
Editorial	38
Catalog of minerals	39
Wants	40
Botany of Southern California—1	41

Continuation only in this number—pages 143-172.

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carinate radical leaf, 3-4' long; scape short, 1-2-flowered, the single pair of bracts linear, 2' long; sepals greenish -y., with a dark-p. spot near the base, oblong- or ovate-lanceolate; petals broadly cuneate, 15" long, bright-y., with a small, well-defined circular densely hairy gland near the base and a lunate purplish spot above it; young capsule narrowly oblong, not winged. On sand-cliffs, Southern Utah (Mrs. E. P. Thompson); June."—S. Watson, Amer. Natl., vii, 7 (May, 1873).

CALOCHORTUS BARNARDI Dougl.

CALOCHORTUS BENTHAMI Baker.

CALOCHORTUS BONPLANDIANUS Shi

CALOCHORTUS CAERULEUS S. Wat.

CALOCHORTUS CATALINAE S. Wat.

CALOCHORTUS CITRINUS Baker.

CALOCHORTUS CLAVATUS S. Watson

CALOCHORTUS DOUGLASSIANUS Sht.

CALOCHORTUS ELEGANS Pursh.

CALOCHORTUS FLAVUS Schult.

CALOCHORTUS FLEXUOSUS S. Wats.

"Branched and flexuous above; bracts alternate, $\frac{1}{2}$ - $\frac{1}{4}$ ' long, linear-lanceolate, carinate, rather rigid; sepals oblong-lanceolate, greenish with a deep-p. and orange or p. gland above, the glandular cuneate, 12-15" long, purplish, with a deep-p. claw and an ill-defined circular orange or p. gland above, the glandular hairs extending laterally to the margin; capsule triangular, narrowly oblong. Southern Utah and Northern Arizona (Mrs. E. P. Thompson); April and May. The bulbs, as of other species, are eaten by the Indians."—S. Watson, Amer. Natl., vii, 7 (May, 1873).

CALOCHORTUS FUSCUS Schult.

CALOCHORTUS GREENI S. Watson.

CALOCHORTUS GUNNISONI S. Watson

CALOCHORTUS KENNEDYI Porter.

CALOCHORTUS LEICHTLINII Hook. J.

CALOCHORTUS LILACINUS Kill. ex G.

CALOCHORTUS LONGEBARBATUS

CALOCHORTUS LUTEUS Dougl.

CALOCHORTUS LYONI S. Watson.

"Near *C. nitidus*; stems branching and somewhat flexuous, 1-2' high, bearing several leaves and 2-4 or more solitary fl.; sepals naked, acute; petals blue or purplish, with a darker p. sparkling brown-villous spot at base surrounding the short-oblong hairy gland, 12-20" long; anthers oblong-elliptical, obtuse, 1-2" long; capsule narrowly elliptical, obtuse, 3-winged, nearly 1' long. Los Angeles County, California; collected on hills near Los Angeles by W. S. Lyon and Dr. Gray, and at Newhall by Dr. Gray, in 1855."—S. Watson, Proc. Am. Acad., xxi, 455 (June 9, 1886).

CALOCHORTUS MAJOR R. & P.

CALOCHORTUS MAWEANUS Leitch

CALOCHORTUS MONOPHYLLUS Lam.

CALOCHORTUS NITIDUS Dougl.

CALOCHORTUS NUTTALLII Torr.-Gray.

CALOCHORTUS OBISOLENSIS Lemm.

CALOCHORTUS PALMERI S. Watson.

CALOCHORTUS PLEURANTHUS Greene.

CALOCHORTUS PULCHELLUS Dougl.

CALOCHORTUS PUSILLUS Dougl.

CALOCHORTUS SPUENSIS Dougl.

CALOCHORTUS TOLMIEI Hook-Ara.

CALOCHORTUS UMBELLATUS Wood.

CALOCHORTUS UNIFLORUS Hook Ara.

CALOCHORTUS VENUSTUS Greene.

CALOCHORTUS VENUSTUS Dougl.

CALOCHORTUS VESTITUS Benth.

CALOCHORTUS WEEDII Wood.

Genus *CAMASSIA* Lindl.

CAMASSIA ESCULENTA Lindl.

CAMASSIA FRASERI Torr.

CAMASSIA LEICHTLINII S. Watson.

Genus *ERYTHRONIUM* Linnaeus.

ERYTHRONIUM ALBIDUM Nutt.

ERYTHRONIUM AMERICANUM Kr.-G.

ERYTHRONIUM GIGANTEUM Lindl.

ERYTHRONIUM GRANDIFLORUM

ERYTHRONIUM HARTWEGII S. Wat.

ERYTHRONIUM NUTTALLIANUM

ERYTHRONIUM PROPULANS A. Gray

ERYTHRONIUM PURPURASCENS

ERYTHRONIUM REVOLUTUM Baker

Genus *FRITILLARIA* Linnaeus.

FRITILLARIA ATROPURPUREA Nutt

FRITILLARIA BIFLORA Lindl.

FRITILLARIA LANCEOLATA Pursh

FRITILLARIA LILIFLORA Lindl.

FRITILLARIA MULTIFLORA Kellogg.

FRITILLARIA PARVIFLORA Torr.

FRITILLARIA PLURIFLORA Torr.

FRITILLARIA PUBICA Spreng.

FRITILLARIA RECURVA Benth.

Genus *BRODIAEA* Smith.

BRODIAEA BRIDGESII S. Watson.

BRODIAEA CAPITATA Benth.

BRODIAEA COCCINEA A. Gray.

BRODIAEA CONGESTA Sm.

BRODIAEA CROCEA S. Watson.

BRODIAEA DOUGLASSII S. Watson.

BRODIAEA FILIFOLIA S. Watson.

BRODIAEA GRACILIS S. Watson.

BRODIAEA GRACIPIFLORA Smith.

BRODIAEA HOWELLII S. Watson.

BRODIAEA INOIDEIS S. Watson.

BRODIAEA LACTEA S. Watson.

BRODIAEA LAXA S. Watson.

BRODIAEA LEMMONAE S. Watson.

BRODIAEA MINOR S. Watson.

BRODIAEA MULTIFLORA Benth

HOOKERA, ORCUTTII Greene.

"Scape stout, 1' or more high; leaves linear, flat or conduplicate, not terete; pedicels 5-15" 1-2" long; perianth-segments oblong-lanceolate, twice the length of the short tube; free portion of the filaments about 2" long, the linear anthers nearly as long; stamodia wanting (?)." —Greene, Bull. Cal. Acad. Sci., ii, 138 (Nov. 12, 1886).

BRODIAEA PEDUNCULARIS S. Wat.

BRODIAEA STELLARIS S. Watson.

BRODIAEA TERRESTRIS Kill. ex G.

Genus *TRILLIUM* Linnaeus.

TRILLIUM CALIFORNICUM Kellogg.

TRILLIUM OVATUM Pursh.

TRILLIUM PETIOLATUM Pursh.

TRILLIUM SESSILE Linn.

Genus *LILIUM* Linnaeus.

LILIUM BLOOMERIANUM Kellogg.

LILIUM BOLANDERI S. Watson.

LILIUM COLUMBIANUM Hort.

LILIUM HUMBOLDTII Roez and Leichtl. Very tall, large golden yellow blossoms, dotted with purple; a very showy and magnificent lily.

LILIUM MARITIMUM Kellogg.
LILIUM PARDALINUM Kellogg. A beautiful lily that seems to flourish in all soils and climates; a luxuriant grower and a profuse bloomer; the large, glowing yellow flowers spotted with brown, the tips of a fiery crimson, very variable in color, however, occurring in many forms.

Var. **BOURGAEI**. A surpassingly beautiful lily; lustrous, fiery red, large and drooping.
LILIUM PARRYI Watson. A pretty and exceedingly rare lily, found in the mountains of Southern California and Arizona, named in honor of Dr. C. C. Parry. Produces lovely clusters of large and very fragrant flowers, of a clear lemon yellow, spiced with a delicious perfume.

LILIUM PARVUM Kellogg.
LILIUM ROEZLI Regel.
LILIUM RUBESCENS S. Watson.
LILIUM WASHINGTONIANUM Kellogg. A marvelously beautiful white lily of a waxy luster, and emitting a delightfully spicy perfume.

Genus CHLOROGALUM Kunth.
CHLOROGALUM ANGUSTIFOLIUM K.
CHLOROGALUM LEICHTLINII Baker.
CHLOROGALUM PARVIFLORUM S. W.
CHLOROGALUM POMERIDIANUM Kt.

Genus ZYGADENUS Michx.
ZYGADENUS ANGUSTIFOLIUS S. W.
ZYGADENUS ELEGANS Pursh.
ZYGADENUS FREMONTII Torr.
ZYGADENUS NUTTALLII A. Gray.
ZYGADENUS PANICULATUS S. Wat.
ZYGADENUS VENENOSUS S. Watson

Genus NOLINA Michx.
NOLINA BIGELOVII S. Watson.
NOLINA BIGELOVII Watson. Leaves flat, rough margined, an inch or more wide; with age attains a height of eight or ten feet; produces heavy panicles of small whitish flowers.
NOLINA PALMERI S. Watson.
NOLINA PARRYI S. Watson.

Genus YUCCA Linnaeus.
YUCCA ALOIFOLIA Linn.
YUCCA BREVIFOLIA Engelm.
YUCCA FILAMENTOSA Linn. "Adam's Needle;" produces tall spikes of snowy white, bell-shaped flowers; very beautiful, and furnishes a fiber of great strength.

YUCCA FILIFERA Chabaud. One of the tallest of the genus; flower stalk over 20 feet high, bearing a panicle of drooping, showy, white flowers.
YUCCA MACROCARPA Engelm.
YUCCA MOJAVENSIS Sargent.

The date, or wild date, of the Mexicans, better known to Americans as the Spanish bayonet, Mexican dagger plant, wild banana, etc., occurs from the Mohave desert to the vicinity of San Quintin, Lower California, extending eastward through the arid regions of Arizona and Sonora, and perhaps to Texas. It attains almost tree-like proportions, and forms extensive forest-like plantations. Such a forest, when in full bloom, is a sight to be remembered. The large, waxy, bell-shaped flowers, of a creamy, sometimes milk-

ed with prune purple, are of surpassing beauty. The fruit does not seem to mature well near the coast. It is somewhat of the size and shape of a banana, of a sweetish taste, slightly reminding one of a fig. Near San Diego the plant is commonly under 8 feet in height; in the interior attains to 15 or 18 feet.

YUCCA VALIDA Brandegee.
YUCCA WHIPPLEI Torr.

Genus HESPEROCALLIS A. Gray.
HESPEROCALLIS UNDULATA A. Gray. The Lily of the Desert, growing in sandy washes on the Mohave and Colorado Deserts, in California. The lustrous waxy white flowers, shaded with green, very fragrant.

Genus VERATRUM Tournefort.
VERATRUM CALIFORNICUM Dur.

Genus BLOOMERIA Kellogg.
BLOOMERIA AUREA Kellogg.
BLOOMERIA CLEVELANDI S. Wats.
 "Differing from *B. aurea* in the several very narrow leaves (1" wide or less), in the stouter scape (3-7" high), in having the thick and fleshy appendage at the base of the filament smooth instead of papillose, and obtuse at the summit instead of bicuspidate, and in the much shorter style, which is shorter than the ovary. On the mesas near San Diego, California; first collected by D. Cleveland, in 1874, and recently received from him and from C. R. Orcutt."—S. Watson, Proc. Am. Acad., xx. 376 (Feb. 21, 1885).

BLOOMERIA MONTANA Greene.
 "Corm 1" broad; leaf solitary; scape 2" high, stout and scabrous; bracts numerous, lanceolate; pedicels 30-50 1-2' long; perianth rotate. 1" in diameter; appendage at base of filament 1" long, its lateral cusps subulate-filiform, ½ as long as the filaments; anthers linear, 1¼" long, attached almost at the very base, but versatile."—Greene, Bull. Cal. Acad. Sci., II. 10-11 (Dec. 14, 1885).

LEUCOCRINUM MONTANUM Nutt.
SMILACEAE.
Smilax californica G.
PONTERIACEAE.
Schollera graminifolia Willd.
ARACEAE.
Lysichiton kamtischatensis Schott
TYPHACEAE.
Sparganium eurycarpum E da 17?
Genus TYPHA Tournefort.
Typha angustifolia L da 17
TYPHA LATIFOLIA Linn.
LEMNACEAE.
Genus LEMNA Linnaeus.
LEMNA MINOR Linn.
LEMNA TRISULCA Linn.
LEMNA VALDIVIANA Phil.
NAIADACEAE.

LILAEA SUBULATA H. B. K.
ZANNICHELLIA PALUSTRIS Linn.
RUFFIA MARITIMA Linn.
Zostera marina L. da 17

Genus NAIAS Linnaeus.

NAIAS MAJOR Allione.
Naias flexilis R & S da 17

Genus TRIGLOCHIN Linnaeus.
TRIGLOCHIN MARITIMUM Linn.
Genus POTAMOGETON Tournefort.

Pectinatus L. da 17
POTAMOGETON LUCENS Linn.
POTAMOGETON NATANS Linn.
POTAMOGETON PUSILLUS Linn.

ALISMACEAE.

ECHINODORUS ROSTRATUS Engelm.
Sagittaria calycina K. da 18

CYPERACEAE.

Genus CYPERUS Linnaeus.
CYPERUS ARISTATUS Rottb.
C. diandrus Torr. v. cistanseus da 18
esculentus L. da 18
CYPERUS LAEVIATUS Linn.
CYPERUS MICHAUXIANUS Schult.
CYPERUS OCCIDENTALIS Torr.
C. VIRENS Michx.

2578 Near Calmhall, Mr. 10

Genus ELEOCHARIS R. Brown

E. AENEOLA Torrey.
2577 Vulcan de las Tres Virgenes Mr. 13.
1 acicularis R. Br.
E. capitata R. Br.
E. palustris R. Br.

Genus SCIRPUS. Linnaeus.

SCIRPUS LACUSTRIS Linn.
v. occidentalis Wat. da 18
Smarthinus L. da 18
riparius Spreng. da 18
torreyana Michx. da 18
SCIRPUS SETACEUS Linn.
S. olneyi Gray.
S. sylvaticus L. v. digynus Borck.
S. pungens Vahl

Genus HEMICARPHA Nees.

H. subsquarrosa Nees.
Cladium mariscoides R. Br. v. californicum Wat. da 18

Genus CAREX Linnaeus.

C. Barbara Drew da 18
—filiformis L. v. latifolia Boeckl. da 18
—maricida Bott. da 18
—murdula L. v. americana Bailey da 18
—multinervis Bailey da 18
—laciniata Bott. da 18
—penicillata L. v. comosa Bott. da 18
—spina Bailey da 18
—angustata Bott. ex

C. siccata Dewey, v. minor
C. triquetra Boott

JUNCACEAE.

Genus JUNCUS Linnaeus.

JUNCUS BALTICUS Willd.
JUNCUS BUFONICUS Linn.
JUNCUS DUBIUS Engelm.
Jengelmanni Ord
JUNCUS LESUERII Boland.
JUNCUS LONGISTYLES Torr.
JUNCUS NUDOSUS Linn.
v. megacephalus Torr. da 18
JUNCUS OXYMERIS Engelm.
JUNCUS PHAEOCEPHALUS Engelm.
—v. glaucus v. paniculatus E. da 18
JUNCUS ROBUSTUS S. Watson.
JUNCUS XIPHIODES Mey.

PALMAE.

ARENCA SACCHARIFERA Labill. The Sugar Palm, of India; the juice is converted into toddy or sugar; the young kernels made with syrup into preserves. The pitch supplies sago, about 150 lbs. from a tree, according to Roxburgh.

ARTOCARPUS INTEGRIFOLIA Linn. The Jack Fruit, of the Malay Islands; attains a weight of 50 pounds.

CHAMAEROPS EXCELSA Thunb. The hardest of all palms; had stood three degrees above zero F. without protection; beautiful fan-shaped leaves.

CHAMAEROPS HUMILIS Linn. The dwarf fan palm of southern Europe; very ornamental, and eligible for scenic effect; hardy.

Genus ERYTHEA S. Watson.

ERYTHEA ARMATA Watson. The beautiful Blue Palm, of Lower California; the fan-shaped leaves of a soft, glaucous color; the fruit is the size of a marble, and largely eaten by the Indians of the desert region where it grows wild.

The Tecos grandes is the fruit of the beautiful blue palm of Lower California, and forms an important article of food with the Indians, ripening in July and August. The fruit is the size of a common marble, with sweet mealy pulp surrounding the large stone (2½ inches in diameter). The tree grows 40 feet high, bearing its fan-shaped glaucous leaves in a very graceful manner. This palm was first found in the Cantillas canyon, Lower California, which opens out onto the Colorado desert, by Dr. Edward Palmer. Dr. J. N. Rose has since found it in Mexico, east of Mazatlan, I believe. The seeds require from six months to three years in which to germinate—the older seeds germinating more quickly than when fresh from the tree. I have had them germinate readily when over ten years old.

ERYTHEA EDULIS Watson. The Guadalupe Island Palm; of equal decorative value

to *Lantana borbonica*, much hardier, and of far more rapid development."

JUBAEA SPECTABILIS Humboldt. The tall and stout Coquito Palm of Chili; hardy; yields small edible kernels; a kind of treacle is obtained from the sap; leaves sometimes 10 ft. long.

OREODOXA REGIA Humboldt. The Royal Palm, "the Glory of the Mountains;" the grandest of the pinnate leaved palms.

PHENIX CANARIENSIS Hort.

Elegant, most hardy, ornamental variety of date palm, much used for lawns in Southern California. 100 seeds: 6c.

PHENIX DACTYLIFERA Linnaeus.

The well known date palm. 100 seeds, 50c.

PHENIX REFINATA Jacquin.

Popular for out door planting.

PTYCHOSPERMA ELEGANS Blume. Leaves 2 to 10 feet in length, widely known under the name of *Scaforthia elegans*, R. Br.

THRINAX ARGENTEA Loud. One of the most elegant of fan palms, the under part of the leaves shining like satin; native of Panama.

Genus WASHINGTONIA Wendland.

"42. He unites the genus *Myrrhis*, Mx. with *Cherophyllum*; the Ch. claytonii of Persoon is however made a *Scandix* by Muhlenberg! which proves that it belongs to neither genera, but *Myrrhis* happens to be erroneous also, by being similar to *Amyris*, a previous genus, whence several names have been proposed for it, *Washingtonia*, *Osmorhiza*, *Gonatherus*; but these are not yet published; the second is perhaps the best."—C. S. R[affin.]. In American monthly magazine, II, 176 (1848). A Review of "Pursh's Flora of North America."

Britton and Brown deemed the above a sufficient publication to justify discarding the established name *Osmorhiza* later adopted by the writer of the above review—necessitating the coming of yet another name for our Californian genus of palms (*Neowashingtonia*).

Prof. C. S. Margent considered the prior suggestion in a newspaper (Winst. In California Farmer, Sept. 1854) of the name *Washlugtonia* for *Sequoia* as insufficient cause for the abandonment of its use. The action of Britton and Brown seems even less justifiable and would cause the present writer to hesitate about accepting any changes proposed by them until after careful investigation of the need.

WASHINGTONIA SO ORES Wat.

"A tree reaching .50 in height & a ft in diam.: leaves 8 or 40 in diam., somewhat glaucous, very fliferous upon rather slender petioles which are armed with stout curved spines; spindle shaped, 5 to 6° long; fr about 8° long, the flattened-globose seed 2-2 1/2" in the longest diam. * * * * * Wat: prain ac 24 79 31 Ja 1889 m j

WASHINGTONIA FILIFERA Wendl. The popular Californian fan palm; a hardy and magnificent species of the desert region of Southern California.

The California fan palm, bearing

great clusters of small black berries, the clusters weighing 10 to 20 pounds each, furnished the desert Indians with a most important article of food, equal to that of the pinon nuts to the mountain tribes, ranking next in value to the mesquite bean. The berries have a thin, very sweet, and pleasant flavored pulp, which any palate might appreciate.

WASHINGTONIA ROBUSTA Wendl.

A favorite strong-growing variety of filifera.

GRAMINEAE.

Genus ARISTIDA Linnaeus.

A. americana L f

— *arizonica* Vasey

— *scabra* K. n th

— *divaricata* HBK

A. DISPERSA Trin.

2561 Data as above, large fls., twisted awns.

2562 Same locality, March 11.

2563 Near Calmalli, Feb. 24.

2564 Same locality, Mar. 5.

2565 Near Vulcan de las Tres Virgenes, Mar.

A. bromoides HBK.

A. purpurea Nutt. var.

A. orcuttiana Vasey

A. CALIFORNICA Thurber.

2556 Valle de las Tres Virgenes, near Santa Rosalia; one of the common forage grasses. Mar. 18, 1890.

2557 Near Calmalli, not rare, March 3.

2558 Santo Domingo, February 21.

2559 Near Mission Santa Gertrudis Mar. 10

v *fugitiva* Vasey

v major Vasey

Genus SPOROBOLUS R. Brown.

S. HUMIFERUS HBK.

2579 Batamotal, near Guaymas, Sonora, Mr. 24.

S. ALTISSIMUS Vasey

"Culm 4-5° high, simple; leaves long, slender, becoming involute; panicle 6-8'

long, narrow the branches erect, scattered or partly verticillate, 3-4' long, subdivided and flower-bearing from near the base; spikelets 1-flowered, about 1" long; empty glumes unequal and nearly as in *S. airoides*—from which it differs in its greater height, and closer panicle, as well as in details of the fl. Collected at San Diego by Dr Edward Palmer."—Brandegee, Proc. Cal. Acad. II. ii. 212.

v. *minor* Vasey:—"Smaller, 2-3° high; leaves shorter; panicle 4-6' long, purple;

spikelets rather smaller, San Enrique [Baja California].—Brandegee, l. c. 213.
S. asperifolius Thurber
S. airoides Turrey
S. ramulosus Kunth.
S. cryptandrus G
 —depauperatus Torr
 —Wrightii Munroe

Genus POLYPOGAN Desf.

P. monspeliensis Desf.
Hilaria rigida Thurber. Gietta grass.
Andropogon dissitiflorus Michx.
A. saccharoides Swartz
 —cirrhatus Hack
 —hirtiflorus Kunth
 —macrourus Michx
 —Wrightii Hackel
 —sorghum Br da 20

Genus PHALARIS Linnaeus.

P. canariensis Linn.
P. intermedia Bosc.
 v angusta Chapm.
P. arundinacea L
P. lemmoni Vasey da 18
Epicampes rigens Bentham j da 20

Genus AVENA Linnaeus.

A. barbata Brot
 —fatua Linnaeus
Deschampsia gracilis Vasey
D. caespitosa Beauv
D. calycina J & C Presl da 19

Genus PASPALUM Linnaeus.

P. distichum Linnaeus
P. pubiflorum Rupt

Genus PANICUM Linnaeus.

P. urvilleanum Kunth,
P. capillare Linn
P. dichotomum Linnaeus
P. colonum L. j da 18
P. crus-galli L. da 18
P. sanguinale L. da 18

Alopecurus geniculatus Linnaeus
 v aristulatus Torr
A. californicus Vasey

Genus AGROSTIS Linnaeus.

multiculmis Vasey da 19
tenuis Vasey
pilosa Beauv
aequalis Trin
densiflora Vasey
diegoensis Vasey
as, erifolia Trin

exarata Trin. et var.
grandis Trin?
microphylla Steud. et var.
scabra Willd. var?
scouleri Trin?
verticillata Vill.
virescens HBK.

Genus POA Linnaeus.

POA ORCUTTIANA Vasey.

“Culmis caespitose, about 2° high, radical leaves numerous, narrow, flaccid, about 6' long, scabrous; culm leaves 2-4 inches long, attenuate at the apex, and with the sheaths scabrous, upper sheath very long; ligule membranaceous, about 2'' long, acute, becoming lacerate; nodes smooth; panicle 4-6' long, lax, the branches erect and somewhat appressed, the lower in threes, 1-3' long, the lower third or more naked, numerous flowered above; empty glumes nearly equal, 1½'' long, the upper 3-nerved, lower one-nerved, scarious margined; flowering glumes oblong, obtusish, flattish on the back, scabrous, about 2'' long scarious tipped, slightly pubescent below, five-nerved; palea as long as its glume, acute, ciliate scabrous on the keels. First collected by C. R. Orcutt near San Diego in 1884, and subsequently by Mr. Lorenzo Jared in Santa Barbara county, Cal. The mature spikelets have the appearance of *Glyceria*. Its narrow, scabrous leaves are good, distinctive characters.”
 —Vasey, W. Am Sci. iii, 165, Ag. 1887.

P. ANNUA L.
P. ARIO Vasey.
P. BIGELII Vasey & Scribner.
P. FENDLERIANA Vasey.
P. HOWELLII Vasey & Scribner.
P. TENUIFOLIA Nutt.
 v californica Vasey da 19
P. ULLATERIANA Scribner.
P. airoides Nutt da 19
 —pauciflora Thurber da 19
 —pratensis L da 19

Genus ORCUTTIA Vasey.

O. CALIFORNIANA Vasey.
Genus LAMARCKIA Moench.
L. AUREA Moench

Genus PHRAGMITES Trin.

P. COMMUNIS Trin.

P. VULGA HBK.

Genus TRICUSPIS Beauv.

T pulchella Torr. is *Triodia* p.

TRIODIA PULCHELLA HBK.

Genus DACTYLIS Linnaeus.

D glomerata L da 19

Genus KOELERIA Pers.

K cristata Pers da 19

Genus MELICA Linnaeus.

frutescens Scribner Or d

imperfecta Trin Or d, da 19

v flexuosa Bol da 19

v refracta Thurber da 19

poeoides Nutt

porteri Scribner

Genus DISTICHLIS Rafinesq.

spicata Ge ca ac b 2:415

maritima Rafin. da 19, is *spicata*

uniola

Genus BROMUS Linnaeus.

hookerianus Thurber da 19

carinatus H-A

ciliatus L da 19

erectus Huds

rigidus Roth

uniolooides HBK

virens Buckl

maximus Desf da 19

rubens L da 19

mollis L da 19

BROMUS ORCUTTIANUS Vasey.

Vv bot gz 10:223 1885, Shear ag b 23; 42

Var. **GAANDIS** Shear ag b 23; 43

"A stout, erect 14-15 dm high very leafy below. Sheaths, leaves & culm pubescent throughout. Panicle about 2 dm long & nearly as broad at base at maturity when the branches are spread more or less horizontally. Spikelets pubescent throughout. * * * Or 472 d

Genus STIPA Linnaeus.

S. coronata Thurber

S. eminens Cav.

v andersoni Vy da 19

S. parishii Vasey

S. setigera Presl.

S. speciosa T. & R.

S comata T. R

S hassei Vy

S occidentalis Thurber

S scribneri Vy

S viridula Trin da 19

Genus LOLIUM Linnaeus.

temulentum L da 19

v arvense With da 19

perenne L da 19

Genus HORDEUM Linnaeus.

jubatum L

murinum L

nodosum L

pratense Huds

pusillum Nutt

Genus ELYMUS Linnaeus.

americanus Vy

condensatus J & C Presl

sitanion fitchii Nutt j, da 20 da 20

orcuttianus Vy da 20 Or d

Genus TRITICUM Linnaeus.

T repens L da 19

Genus PHLEUM Linnaeus.

P pratense L da 18

Genus CALAMAGROSTIS Adams.

densus Vy

koelerioides Vy

robusta & **orcuttii** ined Or d

Genus CINNA Linnaeus.

macroura Kunth

Genus BOUTELOUA Lagasca.

B. ARISTIDOIDES Thurb.

2567 Near Mission Santa Gertrudis, Mar. 10.

bromoides Lag

burkei Scribner

eriopoda Torrey

havardi Vy

oligostachya Torrey

polystachya Torrey Or e

racemosa Lag

ramosa Scribner

rothrockii Vy

Genus MUHLENBERGIA Trin.

M. pungens Thurber

M. DEBILIS Trin.

2568 Data as above.

2569 Same vicinity, Mr. 11.

2570 Near Calmalt, Mr. 1.

2571 Valle de las Tres Virgenes, Mr. 14.

—**calamagrostidea** Kunth

—**californica** Vy

—**dumosa** Scribner

—**gracilis** Trin

—**parishii** Vy

Genus FESTUCA Linnaeus.

myurus L sz, da 19

pseudomyurus S

tenella Willd da 19

arizonica Vy

microstachys Nutt et v **ciliata** G

multicaulis Vy, da 19

elatior L v **pratensis** da 19

F. CUCULFLORA Walt. var.

2572 Near Mission Santa Gertrudis, Mr. 10.

CENCHRUS PALMERI Vasey.
2573 Near Calmall, F. 24, not rare.
P. PPOPHOUM WRIGHTII Watson.
2574 Near Calmall, common on rocky slope,
Mr. 8.
EMATORSTIS MAJOR Host.
2675 Valle de las Tres Virgenes, Mr. 14.
Eneo-mexicana Vv
Ercuttiana Vv
Eoxylepis Torrey
Epooides Beauv. da 19 et v megastachya G.
Ericonia cuspidata Nutt., da 19, is *Oryzopsis* m
Oryzopsis membranacea Vv
Monantho eloe littoralis a Ord, da 20
Eriochloa punctata Ham
Glaucidium aust. al. Beauv
Glyceria reinola Fries
—pauciflora Presl
Hilaria cenchroides HBK
—jamaic Benth
Lepurus paniculatus Fult., da 19
Lepochloa imberba Hurber da 19
Imperitor hookeri Kupr
Egypogon gemmiflorus HBK
Axyroptum divergens Nees
—g. nudum R. S.
—rejens Beauv
—longum Vv
Acund. d. nux L. da 19
Atropis nevadensis Vv
Bacloea actyloides E
Cenchrus tribuloides L.
Chloris elegans HBK
Cynodon dactylon Pers
Danthonia ca. florida B. O. ander da 19
Diplachne imbricata Scribner
—viscidula Scribner
Echinochloa obtusata G
Pleuraphis rigida Thurber, da 19 is *Hilaria* r.
Sorghum a. ap. se Pers
Sotaria stricta Roth da 19
Sotaria glauca Beauv da 18
Stenochloa californica Nutt
Udoia palmeri Vv J
Tritetum barbatum Steud. Ord
—californicum Vv
—elongatum Nutt
—spicatum Hitchc.

EQUISETACEAE.

EQUISETUM ROBUSTUM Al. Br.
EQUISETUM TELMATEIA Ehrh.

OPHIOGLOSSACEAE.

Genus OPHIOGLOSSUM Linnaeus.
OPHIOGLOSSUM NUDICAULE Linn. f.

FILICES.

Genus POLYPODIUM Linnaeus.
POLYPODIUM CALIFORNICUM Kaulf.
Genus GYMNORAMME Desv.
GYMNOGRAMME TRIANGULARIS Kf.
Genus NOTHOLAENA R. Brown.
NOTHOLAENA CALIFORNICA Eaton.
NOTHOLAENA NEWBERRYI Eaton.
NOTHOLAENA PARRYI Eaton.
Genus CHEILANTHES Swartz.
CHEILANTHES CALIFORNICA Mett.
CHEILANTHES CLEVELANDI Eaton.
CHEILANTHES COOPERAE Eaton.
CHEILANTHES FIBRILLOSA Davenport.
CHEILANTHES MYRIOPHYLLA Desv.

CHEILANTHES PARISHII Davenport.
CHEILANTHES VISCIDA Davenport.
Genus PELLAEA Link.
PELLAEA ANDROMEDAEFOLIA Fee.
PELLAEA ORNITHOPUS Hook.
PELLAEA WRIGHTIANA Hook.
Genus PTERIS Linnaeus.
PTERIS AQUILINA Linn.
Genus ADIANTUM Linnaeus.
ADIANTUM CAPILLIS-VENERIS Linn.
ADIANTUM EMARGINATUM Hook.
ADIANTUM PEDATUM Linn.
Genus WOODWARDIA Smith.
WOODWARDIA RADICANS Smith.
Chain fern; fronds 4-8° high, not rare
along perennial streams.
Genus ASPLENIUM Linnaeus.
ASPLENIUM FILIX-FOEMINA Bernh.
ASPLENIUM TRICHOMANES Linn.
Var. *incisum* Moore. Feather fern.
Genus ASPIDIUM Swartz.
ASPIDIUM ARGUTUM Eaton.
ASPIDIUM MUNITUM Kaulf.
Genus PHEGopteris Fee.
CYSTOPTERIS FRAGILIS Bernh.
Bladder fern; Europe, Asia, New Zealand,
Hawaiian Islands, etc
Genus WOODSIA R. Brown.

W. Oregana Eaton.
Southern California.—Parish, no. 1775.
W. Mexicana
Mountains Baja California.—Orcutt

SELAGINELLEAE.

Genus SELAGINELLA Beauvois.
SELAGINELLA RUPESTRIS Spring.
Abundant in several forms.
Genus ISOETES Linnaeus.

I. mexicana Underwood, Bot. Gaz.
San Diego mesas; near Santo Tomas,
Baja Cal.—Orcutt.
I. Orcuttii A. A. Eaton, ined.
San Diego mesas.—Orcutt.

MARSILIACEAE.

Genus MARSILIA Linnaeus.
MARSILIA VESTITA H. & G.
Genus PILULARIA Linnaeus.
PILULARIA AMERICANA Al. Br.

SALVINIACEAE.

Genus AZOLLA Lam.
AZOLLA CAROLINIANA Willd.
Throughout North and South America,
floating on quiet waters.

CHARACEAE.

CHARA FOETIDA Al. Br.
Very abundant in pools from coast to
desert.

LICHENES.

Lichens. These diminutive plants are found in a great variety of forms and in abundance in the vicinity of San Diego, and southward along the coast of Baja California. The shrubs and bushes are often covered, especially in the vicinity of the sea where subjected to the influence of frequent fogs or moist ocean breezes.

Euphorbia misera, species of *Atriplex*, *Lycium*, and other genera are thus decorated,—the trunks and branches with the microscopic fruits of *Lecanora* and still more inconspicuous genera, while the tops are festooned and often almost concealed by the luxuriant growth of foliaceous species, *Ramalina*, *Roccella*, &c.

The mesas around San Diego are prolific in earth forms, the hard sun-baked ground being largely colored with the bright red, yellow, black, or white fruits and thalli of *Biatora*, *Rinodina*, &c.

The pebbles and boulders freely scattered over these mesas (and these remarks apply with equal force to the mesas of Baja California, at least as far as Lagoon Head) are also brightly colored with the thick red fruits of *Placodium bolacinum*, the black specks known as *Verrucaria nigrescens*, with the large black fruit of *Lecanora atra* with its broad white thallus, or with various broad patches of some foliaceous species—white, yellow, brown, or of some other tint or shade that harmonizes with its surroundings,—contrasting pleasantly with the reddish brown earth or the grey colored stones upon which they are comfortably seated.

The weather-stained shingles that Stockton used to roof the old mission of San Diego were highly colored with the commoner species of lichens when I first knew that historic edifice. Other roofs and fences of more recent origin are similarly decorated, and often prove of great attraction to the botanist as furnishing data relative to their rapidity of growth.

The humble home of the trap-door spider (*Cteniza californica*), securely closed by a neat fitting door, tightly held against possible intruders, is often found further concealed by a luxuriant growth of lichens. Whether the sagacious lady of the house is to be credited with their transplanting, as is claimed by some naturalists, or whether they themselves selected the site of their abode, and reached full maturity after the spider's house was built, are questions which it would be interesting to have settled.

Turning away from the close proximity of the sea, we find the rocks in the rugged canyons which break through the foothills covered with a multitude of equally bright and pretty lichens, which often actually lend color to the whole landscape. Thus the rocks at the head of the celebrated Cantillas canyon, in northern Baja California, are rich yellow, while the rocks in the San Teimo canyon, near San Quintin, Lower California, are white with lichens—whitened as if they had been haunted by sea fowl for centuries!

Roccella tinctoria DC.

R. leucophæa Tuckerman

R. phycopsis Ach.

R. fuciformis (L.) Ach.

Ramalina ceruchis De Not.

R. homalea Ach.

R. reticulata Krempell

R. linearis Linn. f.

R. complanata Ach.

R. menziesii Tuckerman

R. calicaris Fr.

v. *farinacea* Schaer.

R. crinita Tuckerman, Bull. Too. Cl.

Evernia vulpina Ach.

E. prunastri Ach.

Usnea barbata Fr.

v. *hirta* Fr.

v. *rubiginea* Michoe.

U. jubata Fr.

U. ochroleuca Fr.

Theloschistes chrysophthalmus Norm.

v. *flavicans* Wallr.

T. parietinus Norm.

v. *polycarpus* Tuckerman

Parmelia perforata Ach.

P. physodes Ach.

P. conspersa Ach.

Physcia erynacea Tuckerman
P. olivacea Ach.
P. tribacea Tuckerman
P. stellaris Linn
v. hispida Schreb.
Placodium coralloides Tuckerman
—murorum DC.
—bolacinum Tuckerman
—cinnabarinum Ach.
—cerinum Hedw.
—ferrugineum Huds.
—fulgens DC.
—luteominimum Tuckerman
—aurantiacum N. & H.
Heppia despreauxii Mont.
Rinodina radiata Tuckerman
R. bolodes Tuckerman
Pertusaria flavicunda Tuckerman
Urceolaria scruposa Smf.
Stereocaulon albicans Nyl.
Cladonia fimbriata Fr.
C. pyxidata Fr.
Lecidea cruciaria Tuckerman
Buellia sidalea Tuckerman
B. myriocarpa DC
Lecanora bolanderi Tuckerman
L. havdeni Tuckerman
L. muralis Schaer.
L. pinguis Tuckerman
L. pallida Schaer.
L. censis Ach
L. subfusca L
L. atra Hudson
L. pacifica Tuckerman
L. cinerea L
Stylographa parallela Nyl.
Chiodecton ephærotum Tuckerman
Arthonia epigina Tuckerman
Acolium bolanderi Tuckerman
A. stijacobi Tuckerman
Endocarpon pusillus Hedw.

↔ Omitted from page 58: —

Larrea Mexicana Moricand.—The grease wood of the Rocky mountain region is very widely distributed, from Texas to California, and is known under a variety of names—perhaps best known as creosote bush, from the un-

pleasant tarry odor which it exhales. "It is principally used in rheumatic affections by the Mexicans, who bathe in an infusion of the branchlets and leaves" (vide Havard), and is said to make a most excellent liniment for use of man or beast, quickly healing cuts and sores. See Proc. U. S. Nat. Mus. VIII, 514.

↔ Omitted from page 59: —

Rhamnus purshiana DC.—Among the native remedial agents most extensively employed in California is this species, which is found only in limited quantity in Southern California. Prof. H. C. Ford records it from the Santa Ynez mountains, and Mrs. R. F. Bingham notes it among the "Medicinal plants growing wild in Santa Barbara and vicinity" (vide Bull. S. B. Soc. Nat. Hist., 1, 2, pp. 30-34). Dr. H. H. Rusby (Druggists' Bull. IV, 334), calls attention to the difficulty of positively identifying and distinguishing this species from its near relative, *R. californica*, in its southern habitat, where the two are usually associated together and recommends that this important drug, *Cascara Sagrada* as it is called, should be collected only in northern California or Oregon to avoid all risks of obtaining spurious bark.

FUNGI.

No even approximately complete list can be presented.
Peziza aciculata L. Or Cuyamaca mt., d
Peridermium ephedrae Ckl. Or on *Ephedra californica*, J
Uredo ephedrae F & E
Ecidium tiliaceae F & E

ALGAE.

In the check-list of 1885 appeared a list of the marine algae collected by D. Cleveland; names in that list are here indicated by the letter c; this has been added to by Mrs. Mary S. Snyder, shown by the letter s; but doubtless more of the old names are synonyms than here indicated, as the late literature is not accessible to the writer.

Agardhrella coulteri Harv. s?
Ahnfeltia concinna J Ag s
—*gigartinoides* Ag. c—is *concinna*.
—*plicata* Fr. c
Amphiroa aspergilum J E Gray s

—cretacea —	c	—squamata Ellis & Sol.	c are
—nodulosa Kutz	s	chilensis Desem [s] v californica.	
—orbigniana Harv.	c s	—rassa collins	s
Andersoniella farlowii Schmitz	s	—gracilis Lamour	s
Antithamnion floccosum pacificum Hv	s	Cordylecladia conferta Mont.	c s
Arthrocladia —?	c	Colpomœnia sinuosa Derb & Col	s
Asperococcus sinuosus Bory.	c—is Col-	—tuberculata Saunders	s
pomenia sinuosa		—expansa Saunders	s
Bangia fusco-purpurea Syng	s	Cruoria purpurea Crn.	c
Bryopsis plumosa Lmx.	c s	Cryptonemia crenulata Ag.	c
Callithamnion americanum Harv.	c	—dichotoma J. Ag.	c
—dasyoides Ag	c s	—obovata Ag.	c s
—heteromorphum J. Ag.	c	Cystosiera osmundacea Ag	s
—lejolisea Farlow.	c	Dasya helenæ Farlow	c
—scopulorum	c	—pacifica Harv	s
Callimènia californica Farlow	s	—subsecunda Suhr.	c s
Callophyllis centrocarpa	c	Delessiria quercifolia Bory.	c
—furcata Farlow	s	Derbesia tenuissima Cronan	s
—gracillarioides Farlow.	c s	Desmarestia ligulata Lmx.	c s
—laciniata Kutz.	c s	—var. herbacea	c
—obtusifolia Ag.	c	Dictyota kunthii Ag. c is binghamiæ J	
—variegata Kut.	c s	Ag. s	
Ceramium californicum J Ag	s	Dictyopteris bonarioides Farlow	s
—codicola J Ag	s	Ectocarpus crinitus Harv.	c
—rubrum Ag. c is v pacificum Col.	s	—fasciculatus Ag.	c
Centroceras clavulatum Mont	s	—granulosus Ag.	c
—eatonianum Farlow	s	—siliculosus Lyng.	c
Ceratothamnion pikeanum	s	—virescens Thurst.	c
Chætomorpha ærea Dillw.	c s	—confervoides Le Jol	s
—californica Collins	s	v pygmæus Kg	s
—clavata c; v torta Farlow	s	—mitchellæ	s
Chondria atropurpurea Harv.	c	Egredia menziesii Aresch.	c
—nidifica Harv	s	—lævigata Setchell	s
—tenuissima californica Collins	s	Eisenia arborea Aresch.	c s
Chondrus affinis Harv.	c s	Endocladia muricata J. Ag.	c s
—canaliculatus Ag.	c s	Entromorpha compressa Grev	c
Chrysemenia obovata	c =	—intestinalis Lmx.	c
—pseudodichotoma Farlow	s	—flexuosa	s
Cladophora ecklonii	c	Farlowia compressa J. Ag.	c
—hutchinsæ Farlow		Fucus fastigiatus Ag.	c
—membranacea Ag.	c	—harveyanus Desem	s
—stimpsoni	s	—vesiculosus Linn.	c
Codium tomentosum Stack.	c	Gelidium carneum Lmx. c is amansii	
—lindenbergi Ag	s	Lam s	
—mucronatum californicum J Ag	s	—australe	s
Coilodesma californica Ky	s	—cartilagineum Grev.	c s
Corallina officinalis Linn.	c and	—coulteri Harv.	c s
		—crinale Ag.	c

v spathulatum Hauck	s	Nemalion andersonii Farlow	s
Gigartina canaliculata Harv.	c s	Nemastoma californica Farlow	s
—mammillosa Ag.	c	Nereocystis gigantea Aresch	s
—microphylla Harv.	c	Nereocystis lutkeana Post & Rupr.	c
—var. horrida Farlow	c is radula forma horrida Farlow	Nitrophyllum andersonii Ag.	c s
—pistillata Ag.	c	—latissima Ag.	s
—radula Ag.	c s	—ruprechtianum Ag.	c s
forma horrida Farlow		—violaceum Ag.	c s
forma microphylla	s	Ophidocladus simpliciusculus	s
—spinosa Harv.	c s	Palmella crassa Ag.	c
—horrida Farlow	s	Pelvetia fastigiatus Deseve & Thua	s
—jardini J Ag	s	Phylletis fascia Knetz	s
—papillata formæ cristata et dissecta	s	Petrospongium berkleyi Nally.	c
Gracillaria confervoides Grev.	c	Peys onnellia atropurpurea Crn.	c
—multipartita Ag.	c	—dubyi Crn.	c
Grateloupia cutleriæ Kutz.	c	—squamaria Dec.	c
Gymnogongrus leptophyllus Ag.	c	Phyllophora clevelandii Farlow	c s
—linearis Ag.	c	Phyllophora menziesii Ag	s
Halidrys osmundacea Harv.	c is Cystosiera osmundacea.	Pikea californica Harv.	c s
Helminthocladia purpura-cens J Ag	s	—clevelandii Farlow	c
Herposiphonia villum J Ag	s	Plocamium coccineum Lyng.	c s
Hypnea divaricata Grev.	c	—var. californicum	c
—musciformis Lmx.	c s	—flexuosum	c
—adunca J Ag	s	—sinuosum	c
—crinalis Harv	s	—violaceum Farlow	c s
Iridea minor Bory.	c	Polypea bushiæ Farlow	s
—lamnarioides Bory	s	Pogonophora californica	s
Jania rubens Lmx.	c is corallina crassa.	Polysiphonia baileyi Ag.	c is Ptersiphonia baileyi.
Laminaria farlowii Setchell	s	—bipinnata Post & Rupr.	c is Ptersiphonia bipinnata
Laurencia cervicornis Harv.	c	—californica Harv.	c is Ptersiphonia c.
—pinnatifida Lmx.	c s	—clevelandi Farlow	c s
—virgata J. Ag.	c s	—collabeus	s
—paniculata	s	—dictyurus J. Ag.	c
—papillo-o Grev		—parasitica Grev.	c
Leathesia tubertiformis Gray	c	—var. dendroidea Ag.	c s
Lithothamnion polynum Aresch.	c	—pinnata Ag.	c s
Lithothrix aspergillum Gray	c is	—senticulosa Harv.	c s
Amphiroa aspergillum		—ureolata Grev.	c
Lomentaria ovalis A. Culteri Harv	c	—verticillata Harv.	c s
Lophosiphonia obtusa		—villum Ag.	c is Herposiphonia villum.
Macrocystis pyrifera	c s	Porphyra vulgaris Ag.	c is perforata v
Melobesia amplexifera	c	—uladum Anderson	s
—lenormandi Aresch.	c	—unioensis Annerson	s
—membranacea Lmx.	c	—perforata forma segregata	s
Microcladia californica Farlow	c	Prorocentrum andersonii Eaton	c is segregata
—culteri Harv.	c s	—californicum Farlow	c

- lanceolata Harv. c s ABBREVIATIONS, SIGNS AND
—decipiens s BIBLIOGRAPHY.
- lyallii forma gladiata Setchell s A = America
Pterodophora californica Rupr. s ac—academy
Pterosiphon a baileyi J Ag s aes—agricultural experiment station
—woodii Harv s Ag—August
—clevelandii s Am—American
—parasitica dendroidea s Ap—April
Pterygophora californica Rupr. c ARLOING, S.:
Ptilota densa Ag. c s —Recherches anatomiques sur le boutur-
age des Cactées. Ann. des Scienc. Nat.
—hypnoides Harv. c VI. Bot. iv. 95-152, pl. 1-2.
Ralfsia verrucosa Aresch. c b—bulletin
Rhodomela larix Ag. c b—San Bernardino county, Ca
—subfusca Ag. c BAILLON, H.:
—Histoire des plantes.
Rhabdonia couteri Harv. c s BALTIMORE CACTUS JOURNAL:
Rhodochiton floridulum Noy s i. JI 1894-Je 1895. (144 p. — f.).
Rhodymenia corallina Grev. c s ii. JI 1895-Mr 1896. (145-236 p. — f.).
—flabellifolia (Bory) Ag. c Br—
—palmata Grev. c s BRANDEGEE, TOWNSEND STITH:
Riccardia montagnei Derb. & Sol., var. —Cactaceæ of the Cape region of Baja
gigantea Farlow. c s California. Zoe. II. 18-22. Ap 1891.
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Sargassum agardhianum Farlow c s Bull. Geol. and Geogr. Surv. Terr. II. 227-
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phyllis californica CANDLEE, A. I. de:
—Memolre sur quelques especes de
Scinaria furcellata Bivona s cactees, nouvelles ou peu connues. 1834.
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Scytosiphon lomentarius Ag. c s —Revue de la Famille des Cactees; avec
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snyderæ Farlow s leur culture, ainsi que sur celles des
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—Beitrag zur Kenntn ss des Hautge-
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—Cactaceous plants; their history and
—tribuloides Mengh s culture. 1884. (93 p. et 16 f.).
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Stenogramme interrupta Mont. c s Ca—Alta, or Upper California
Sterrocolax decipiens Schmitz s COLLA, A.:
—Plantæ rariores in regionibus Chilensi-
Taenioma clevelandii Farlow c bus.
Taonia lennebackeræ Farlow s —
Ulva lactuca i inn. c s COULTER, JOHN M.:
—Preliminary revision of the North
—californica Wille s American species of Cactus, Anhalonium
—enteromorpha Tepolis s and Lophophora. Contr. U. S. Nat. Herb.
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Cv—
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D—December
d—San Diego county, Ca

E—

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ε—Colorado deert, d

E-B—E et J M Bigelow

F—February

f—figure

Fr—

FÖRSTER, CARL FRIEDRICH:

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fl—flower

fr—fruit

ft—feet

G—Asa Gray

Ge—Edward Lee Greene

h—Colorado descr., Riverside county

HAWORTH, A. II.:

—Saxifagearum enumeratio. Accedunt revisiones plantarum succulentarum. 1821. (208 p.).

hb—herbarium

He—A Arthur Heller: cat N A plants.

Hm—

HEMSLEY, W. BOTTING:

—Biologia Central-Americana. Botany. i. 1875-1888.

J—journal

j—Baja or Lower California

Ja—January

Je—June

Jl—July

KBr—Katharine Brandegee

Kg—Albert Kellogg

KLEBERG, DR.:

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L—Carl von Linnæus

L—Los Angeles county Ca

Lab—J Labouret, Monog. Cact. 1858.

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Len—

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m—Mexico

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Mr—March

My—May

N—November

n—New Mexico, north, new

Na—National

O—October

o—Oregon

Or— [W]

ORCUTT, CHARLES RUSSELL:

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p—pages, purple

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pr—proceedings

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Py—Charles Christopher Parry

q—Mohave desert, b

r—report

RUNGE, CARL:

—Zwei neue Cacteen. Gartenflora. 1882. 105-106. (2 f.).

S—September

s—vicinity of San Diego, Ca

Sn—

SALM-DYCK, JOS. de:

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1850. (268 p.).

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sr—series

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t—plate

Tr—

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tr—transactions

VOCHTING HERMANN:

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Vy—George Vasey

W—West Am Scientist

w—Washington, west, white

Wat—[bot Ca]

WATSON, SERENO:

—Biographical index to North American botany. Pt. 1. Polypetalæ. Mr 1873 (476 p.).

y—yellow

z—Arizona

ZUCCARINI, JOS. GERH.:

—Plantarum vel minus cognitarum, que in Horto botanico herbarioque regis monacensi servantur

Fasc. III. Cactæe. 597-742. (5 pl.).

o—feet

☞—perennial

@—annual

£—ligneous or woody

/—inches

//—lines, 12 to an inch

†—introduced or naturalized

- to

✂—Omitted from page 61:—

SCHINUS MOLLE Linnaeus. The Peruvian, or Mexican, Pepper tree, one of the most graceful and popular of ornamental trees in California; with pendant, fern-like, foliage, and bearing clusters of beautiful rosy-red berries.

The Botany of California, finished by Bereno Watson and published in 1880, through the generosity of gentlemen of a past generation, uniform with and as a part of the state geological survey publications, marked the commencement of a new era of botanical activity on the Pacific coast. The next decade saw many additions to the state flora through the labors of a group of collectors who assiduously explored mountain and desert regions alike. In 1879 Heman Chandler Orcutt moved with his family from the Green Mountain state to San Diego, and took part in this work of exploration, which only ended with his life in 1892.

Parry, Pringle, the Parish Brothers, Palmer and many others were especially active, with Gray Greene, Brandegee Watson and Vasey as the principal writers on their field work.

The last decade of the 19th century is noteworthy for the attempted changes in nomenclature as proposed by Kuntze, followed by Coville, Greene, Britton and other, mostly the younger, botanical authors.

In the present work the writer avoids the adoption of the most of the proposed changes, aiming to make it a supplement to Watson's great work—with this in view reproducing descriptions of species discovered since 1880. Notes and descriptions of all the plants would have been added but for the expense.

Omitted from page 46:

Paeonia Californica Nutt.—The root of the "Plonia" is considered valuable by the natives for the healing of sores on man or beast.

Omitted from page 54:

Krameria Parvifolia Benth. *Krameria Canescens* Gray.—These small bushes contain tannin and may be found useful medicinal plants (fide Havard), and are not rare on the border

ers of the Colorado desert in Southern and Baja California, eastward to Texas, and into Mexico.

In the Mission days of California, the Jesuite and Franciscan fathers and the early settlers found it necessary to rely upon their own resources and to become proficient in many trades and professions which in a more advanced stage of civilization are relegated to specialists. Medicine and surgery were sciences which naturally demanded the attention of every one, especially of the fathers who were virtually entrusted with both the spiritual and physical welfare of these primitive communities. At times, doubtless their limited stock of simple remedies ran low, and with the slow means of communication with other communities, and with Mexico and Spain, whence they drew their earlier supplies, they gladly availed themselves of the traditional knowledge of the virtues of native plants which obtained among the Indian population around them.

Among the Californian aborigines, as among most tribes of Indians, there existed so-called medicine men or doctors, who, by practicing on the superstitions of their fellows, and with the aid of their traditional knowledge of the virtues of certain plants—handed down from generation to generation of medicine men—followed with greater or less success the healing art.

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Whole No. 101.

Zwei neue einjährige *Epilobium*-Arten.

EPILOBIUM APRICUM sp. nov. Aufrecht, 1-7, meistens 4-6 dm hoch, drüsig-kurzhaarig in den Blütenständen und an dem blattreichsten, mittleren Teil des Stengels, sowie an den mittleren oder unteren Teilen der Äste. Stengel weisslich, mitunter teilweise gerötet, schlank und grade, etwa das mittlere Drittel verästelt oder bei kleineren Pflanzen oft einfach; Äste ebenfalls schlank und grade, einfach oder selten in der Mitte verzweigt. Blätter 2-3 cm lang, oder in den Blattbüscheln und an den Zweigen oft viel kürzer, weissgrün, schmallanzettlich bis linealisch, mit sehr kurzer, aber meistens scharfer Spitze, am Grunde verschmälert und mitunter in einen kurzen Stiel verlaufend, ganzrandig oder zuweilen mit schwachen Zähnen, steif, dicklich, rinnenförmig, meistens etwas zurückgebogen, besonders der Gipfel. Blüte 15-20 mm oder weniger lang, in kurzen Trauben an den Enden der Zweige, oder in kleinen achselständigen Büscheln, sehr kurz gestielt oder sitzend, von ziemlich breiten, 1-2 mm langen Deckblättern begleitet. Kelch drüsigkurzhaarig, oder an den Lappen und dem Fruchtknoten teilweise kahl; freier Teil der Kelchröhre 3-5 mm oder weniger lang, je nach Grösse der Blüten. Kronenblätter weiss oder rötlichweiss, 4-8 mm lang oder weniger. Kapsel auf einem 1-2 mm langen Stiel oder fast sitzend, aufrecht und grade, 12-20 mm lang oder weniger, schmal, nur etwa 1.5 mm breit und nach beiden Enden zu verschmälert, 4-8 samig, oder wenn kurz, 1-3 samig; der dünne samenlose Gipfel nimmt etwa ein Drittel der Kapsellänge. Samen 2 mm lang, 2 oder weniger in einem Fach. Auf trockenen Halden bei Bingen in Washington, vom Thalboden aufwärts bis zu einer Höhe von etwa 200 m. Von mir im September und Oktober 1898 gesammelt (Nr. 2640).

EPILOBIUM FASCICULATUM sp. nov. Steht dem *E. jucundum* am nächsten, ist aber schlanker, grüner und hat kürzere Äste und Blütenstände. Die Mitte des Stengels, sowie die unteren Äste sind dicht mit Blattbüscheln bedeckt. Blätter gestielt 2-4 cm lang oder weniger, Platt oder zusammengefaltet, meistens mit scharfen Zähnen am Rande, Blüten kurzgestielt, 8-14 mm lang oder kleiner, in kurzen, ziemlich dichten Trauben und 1- bis 3-blütigen, achselständigen Büscheln. Blütenstände ganz oder teilweise drüsigkurzhaarig, die Kelchlappen und die schmalen Deckblätter jedoch meistens kahl. Kelchlappen länger als der freie Teil der Kelchröhre. Kronenblätter 5-6 mm lang oder kleiner, blaurot mit dunkleren Adern. Kapsel meistens kurzgestielt und etwas gebogen, 10-22 mm lang, etwa 2 mm breit, linealisch, die samenlose Spitze kurz;

Fächer je 2- bis 5-samig. Auf ebenen, feuchten Plätzen im Falkenthal (Falcon valley*), Klickitat county, Washington, 22 August und September 1896 (meine Nr. 2641). Diese Form könnte auch wohl als Abart von *E. jucundum* aufgefasst werden, da aber Prof. Wm. Trelease letztere unter *E. punctulatum* stellt, so ist es wohl das Beste, die neue Form noch gesondert zu halten.

WILHELM N. SUKSDORF.

WEST AMERICAN MOLLUSCA.

PHYLLAPLYSIA TAYLORI.

"The Rev. Dr. Geo. W. Taylor, of Wellington, British Columbia, has recently forwarded to me some marine slugs which were found on floating sea-grass near Nanaimo, Vancouver Island. An examination shows that these animals represent a genus, *Phyllaplysia*, not hitherto known except in Southwestern Europe, and an undescribed species. The animal in most respects differs very little from *P. lafonti* Fischer, the type of the genus. It is subtranslucent, smooth, of a uniform pale lemon-yellow color, very much flattened, resembling some of the Planarian worms. The specimens sent by Dr. Taylor are presumably somewhat contracted by alcohol, which may account for the form of the rhinophores and tentacles, which are short, conical, and strongly transversely wrinkled, but without tuberculation or color pattern, being of the same pale yellow as the rest of the body. The 'rainure' extending from the right tentacle to the branchial opening is a plain line barely perceptible; the branchial pit with 2 minute lobes is short and in about the same relative position as in *P. lafonti*. The body is much depressed and the margins thin, sharp and even. The eyes appear as conspicuous small black spots in front of the bases of the posterior tentacles. The general form is elongate oval, the ends of the rhinophores, unlike the tentacles, are blunt, and these organs are sulcate inferiorly as usual. The length of the largest specimen, as contracted in alcohol, is about 20 mm., and the breadth about 9 mm. I propose for it the name of *P. taylori* in honor of its discoverer. Of the 3 other species known, *P. lafonti* is pale green, with darker bands and numerous violet spots; *P. depressa* is green-buff, variegated with black; and *P. limacina* is of a dusky green. All of these are from western and southern Europe." —Dall *Nautilus* 14:91-92 (D 1900).

*Ein Teil dieses Thales ist als Camas Prairie bekannt, ein Name der für viele Plätze benutzt wird. Seit einer Reihe von Jahren nennt man diese Gegend oft blos Camas, welcher Name auch für einen Ort in Clarke county, Wn verwendet wird. Wahrscheinlich die grösste und bekannteste Camas Prairie ist in Idaho.

SCAPHELLA (Voluta) ARNHEIMI.

"Shell regularly formed, elongate-ovate; body whorl more than $\frac{2}{3}$ as long as the spire; the spire an inch long, and made up of 6 whorls, the terminal nucleus being very small, pointed and oblique, which latter character places this species in the section Scaphella of Dall. Ground color obscure yellow, covered by a layer of chalk-like deposit.

The body whorl has some coarse longitudinal elevations and depressions, remnants of former lip extensions, and there are 2 large patches of dark rusty red at a wide interval which do not appear to form an interrupted band. The aperture is elegantly formed and measures $1\frac{1}{2}$ inches long by $\frac{1}{2}$ in. wide. The inner lip is regularly outlined on the columella; columella plaits 4, sharply oblique, the last one strongest, forming a prominent ridge parallel to the canal. The upper outlines of the mouth meet in a sharp angle, but the base has a well defined bifurcation. The whole of the aperture and the edge of the outer lip are heavily coated with enamel of a yellowish tint, and rust stained. Size $3\frac{1}{2}$ inches long, and $1\frac{1}{4}$ inches wide. Animal without operculum. Dredged in Monterey bay, California."—J. J. Rivers, *Caac pr ser* 2, 3:—; *Nautilus* 5: 111–112.

UVANILLA REGINA.

"Shell conical, imperforate, black or purplish-black; whorls 6–7, concave, longitudinally somewhat obliquely plicated, the plicae more or less projecting at the suture, and on the edge of the basal whorl, producing an undulating or crenulated effect. Otherwise sculptured by incremental striae which traverse the surface and cross the plicae at right angles. Base concave, radiately, closely and prominently striated, more conspicuous, flattened, coalescing, and sinuously curving at the edge. Commencing at the point where the outer lip joins the body whorl, a shallow groove follows parallel to the periphery and extends toward the aperture, without interrupting the basal sculpture. Aperture obliquely subangulate, black-rimmed and crenulated on the thin edge of the outer lip; nacreous, silvery white toward the edge, bright lustrous golden yellow within and around the umbilical region which latter though deeply pitted is not open. Columella white, calloused, arcuated with a moderately developed rib bounding the umbilical depression, and terminating in a single tubercle. This rib is paralld by a shallow furrow terminating in a notch just below the tubercle, and by an exterior or outer ridge, part of the way double, of a

brilliant orange color; this orange-colored rib is also exteriorly bounded by a shallow furrow which becomes obsolete toward the aperture. The base of the shell otherwise exhibits faint revolving sculpture. Dimensions: Altitude, 36 mm., diameter maximum, 34 mm. The above combine the sculptural features of the Japanese *Chlorostomas* and West Mexican *Uvanillas*, more particularly *U. olivacea*. It is a much handsomer shell than the latter and the most northerly form of the group yet detected on the west coast."—Stearns, *Nautilus* 6: 85-86. Guadalupe Island.

YOLDIA MONTEREYENSIS.

"Shell large, stout, inflated, with a polished, dark greenish olive epidermis; beaks eroded in all the specimens, situated in the anterior part of the middle third of the shell, not prominent; valves full and rounded, anterior end evenly rounded into the upper and basal margins; posterior end narrower, rounded, the extreme end nearer the cardinal margin with which it almost forms an angle, below sloping obliquely toward the basal margin, with a very obscure broad ray impressed in a radiating manner from the beaks toward the oblique slope, the profile of which it does not perceptibly indent; surface sculptured only by feeble incremental lines; epidermis polished with one or two darker concentric color zones and a microscopic, irregular, radially disposed wrinkling, most conspicuous at the margins of the impressed ray; posterior cardinal margin nearly straight, anterior ditto evenly rounded; interior porcellanous white, the pallial sinus not reaching the middle vertical line of the shell, broad and rather rounded; ligamental fosset large, cuplike; anterior teeth V-shaped, about 22 in number, strong and prominent; posterior teeth similar, and forming an equally long line but only 18 in number, the posterior cardinal margin showing a long narrow impressed area very feebly marked; length of shell 32; beak from anterior end 12; vertical from beak to base 17; max. diameter 13 mm. Habitat U. S. Fish Com. station 3202, in 382 fathoms green mud, Monterey bay, California, bottom temperature, 41 deg. Fahrenheit. This fine shell recalls *Y. thracæiformis*, but is smaller, without the angularity of that species and proportionately more solid. It was dredged by the U. S. Steamer *Albatross*, several years ago. It is probably a deep water species exclusively at least in the latitude of California. The types are in the U. S. Nat. Museum, 106,972."—Dall *Nautilus* 7: 29-30. J1 1893.

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Just a thought to give thee pleasure,
Just a hope to gild the way,
Just a word to speak of Jesus,
Do you love Him as you may?

THE COLORADO DESERT.

A vast triangular-depressed plain, below the level of the sea for a large portion of its surface, with an approximate area of twelve million acres (about one-half of which lies in Mexican territory), and comparatively destitute of verdure or of animal life, is the great basin known as the Colorado Desert.

This remarkable region lies between the peninsular range of mountains and the Colorado river of the west, extending from the San Geronio pass, at the base of the San Bernardino mountains, on the north, to the shores of the Gulf of California, on the south, and forms one of the most extensive and important portions of the arid regions of the United States. On the north and northeast it is separated from the more elevated plains of the Mohave desert by a low range of denuded hills, extending from the San Bernardino mountains to near the junction

of the Gila and Colorado rivers. Similar arid conditions exist on the eastern borders of the Colorado river, in Arizona, and south in Sonora, and along the Gulf shores.

From their rich chocolate-brown color, the inhospitable barrier between the Colorado and the Mohave deserts is frequently indicated on maps as the Chocolate mountains; but the range is better known to miners as the Chuckawalla (Lizard) mountains, a peculiarly appropriate name, from the great abundance and variety of lizards, but probably given from some fancied resemblance in the outline of these hills to this nimble animal.

The peninsula range of mountains, with a varying altitude of four thousand to eleven thousand feet, rise in precipitous abruptness from the western borders of the plains. The crest of this mountain range forms a sharp and well-defined line of demarcation between the arid region and the rich and fertile western slope. The summit is usually clothed with forests of oak and pine. The western slope is thickly overgrown with a varied vegetation, the valleys supplied in a greater or less degree with timber and water. Not so on the eastern declivity—the precipitous walls of rock, hundreds, often thousands of feet in height, present small inducements for plant growth, and the less precipitous banks are but slightly less devoid of botanical forms.

In the mighty chasms (or canyons), eroded by the still active, tremendous forces of nature, the botanist finds his richest harvest amid scenery that for beauty and grandeur would



rival even the Yosemite. Surrounded by walls three thousand feet or more high, the queenly Washington palm (*Washington filifera*) may be found in groves, growing with tropical luxuriance beside quiet brooklets, rivalling in beauty and novelty the giant Sequoia groves of California.

Despite the large areas totally barren of vegetable life for the larger portion of the year, the absolute lack of rain through long periods, which may extend over three or more years of time, the Colorado desert possesses in seasons of precipitation a flora that in variety and beauty of forms surpasses that of the Atlantic states. In richness of variety and coloring, the flora of California is probably unsurpassed, and the arid regions of the state are not one whit behind the more attractive western slopes. In springtime the stately lily of the desert (*Hesperocallis undulata*) waxes its sweetness on the desert air; every dry and thorny bush produces its quota of beauty, and a wealth of brilliant annuals spring into brief existence.

During June and July, 1888, the writer made his initial exploration in the Colorado desert, the main object being the examination of various prospects of gold, silver, lead and copper, which had been discovered in the Chuckawalla mountains, for a gentleman who was largely interested in their development. A brief report on this region, named the Pacific mining district, appeared in the tenth annual report of the California state mineralogist, 1890 ("The Colorado Desert," by Charles Russell Orcutt, pages 899-919).

Lyell says:—"Geology is the science which investigates the successive changes that have taken place in the organic and inorganic kingdoms of nature; it inquires into the causes of these changes, and the influence which they have exerted in modifying the surface and external structure of our planet."

In the decade commencing with 1850 the more depressed part of the Colorado desert seems to have been known as the Cienega Grande, now better known perhaps as the Salton Sea, but more usually designated as

the Dry Lake; in 1870 we are told by early emigrants of that period that the Colorado river was in the habit of annually overflowing its banks during the time of summer freshets, when the snows melted in the mountains whence the river has its source. This "annual overflow" (as often omitted as otherwise, it is said) formed a channel through the deep alluvial bottom lands of the great basin, to which the name New River was applied by the earlier pioneers who crossed the desert on the old overland route from Ft. Yuma to San Diego.

Along the course of New River, the Cocopa and other tribes of Indians planted and raised magnificent crops on the overflowed lands. Corn, melons, squashes, and other vegetables, and grain, reached the rankest growth attainable, and some of these early pioneers spoke with wonder of the fertility of the soil and the success attending these Indians in their agricultural labors. These fertile lands were formed of the sediment deposited by the waters of the Colorado river, and as the soil increased in depth the overflow decreased; with the increasing infrequency of these overflows now of more rare occurrence, the Indians were compelled to depart—the Cocopas retreating to the region of the gulf, the Cahullias to the mountains around the northern arm of the desert. In 1890 the desert Indian huts might yet be found among the mesquite groves of New river, and in 1892 I found the Indians producing from the untilled soil crops of promise, after an overflow of some of the lands below the United States boundary.

"Approaching Carrizo creek, we saw for the first time in many days, strata of unchanged sedimentary rock. These consist of shales and clays of a light brown or pinkish color, forming hills of considerable magnitude at the base of the mountains. From their soft and yielding texture they have been eroded into a great variety of fantastic and imitative forms. This series of beds have been greatly disturbed, in many places exhibiting lines of fracture and displacement. Where they are cut through in the bed of Carrizo creek, they contain concretions and bands of dark brown ferruginous limestone,

which include large numbers of fossils, ostreas and anomias. These have been described by Mr. Conrad, and are considered of Miocene age. In the debris of these shale beds I found fragments of the great oyster (*Ostrea titan*), characteristic of the Miocene beds of the California coast. A few miles north of this point, similar strata, probably of the same age, were noticed by Dr. Le Conte, but there they contain gnathodon, an estuary shell, showing that the portion of the desert where they are now found was once covered by brackish water."—J. S. Newberry.

Dr. J. G. Cooper reports (in bulletin 4, California state mining bureau, pages 58 and 59) the discovery by H. W. Fairbanks, near Carrizo creek of "fossil coral-islands, the coral forming extensive beds about the summits of short isolated ridges detached from the mountains of the western rim, and consisting at their bases of granitic or metamorphic rocks. The ridges appear to have been islands when the desert formed part of the Gulf of California, or of the Pacific ocean, and were at the right depth beneath the surface for coral growth on their summits for a long period. With the coral occurred several fossil shells of forms quite unlike those of the late tertiary of Carrizo creek beds, and apparently unlike those now inhabiting the Gulf of California."

Fragments of fossiliferous rock of the Carboniferous age have been found in the Carrizo creek region by various collectors, but none in place have yet been reported.

The Indians, according to Dr. Stephen Bowers, still preserve the memory of catching fish along the eastern base of the San Jacinto mountains, where the Cahuilla Indians pointed out to him the artificial pools, or "stone fish traps," where their ancestors easily secured the fish on the receding of the tides of the ancient sea. This would seem to indicate that the change from an arm of the gulf is comparatively recent, and a study of the fossils seems to confirm this view. An old Indian in the Cuyamaca mountains pointed out to miners a few years ago points in the hills to the eastward where his

great grandfather used to catch fish from the sea.

The cause of the separation of this region from the gulf can be readily understood in the present encroachment of the land that is forming from the sediment and debris of the Colorado river, where it empties into the gulf. With the formation of a barrier separating the basin from the gulf, the imprisoned waters were at once subjected to rapid evaporation.

The presence of fresh water shells in a semi-fossil condition, of a brackish water mollusk, and of marine shells of species now found living at San Diego, on the Pacific side, would seem to indicate that the great changes which have unquestionably taken place in this remarkable region were the result of natural phenomena of gradual, yet rapid, occurrence. After its isolation from the sea, with rapid evaporation, few years were requisite to transform this basin from an arm of the sea to a barren waste, the salt of the sea water forming the salt mines at Salton.

The Colorado river doubtless hurried past as it does today to the gulf, until breaking down the barrier it had itself erected. With alternate periods of evaporation and influx of fresh water, the great basin changed first to a brackish lagoon, and finally to a vast fresh water lake.

The water of the Colorado river at Yuma is known to carry at high water not less than ten per centum of solid matter. The deposit of this sediment in the great basin doubtless rapidly formed the deep and fertile lands which are now being harnessed into service at Indio and Imperial, and being converted at the latter place, by the utilizing under control of the water from the Colorado river, into fields of agricultural promise.

Dr. Robert Edward Carter Stearns, in a paper read before the California academy of sciences, entitled "Remarks on fossil shells from the Colorado Desert" (published in the American Naturalist, 13:141-154, March, 1879), discussed the occurrence of fresh water shells found in a well at Walter's station at a depth of fifty feet. The surface of the desert where this well was

sunk is 195.54 feet below sea level. Dr. Stearns remarks:

"Shall we indulge in a guess as to the depth of the water when these shells were alive? Shall we add the depth of the well to the elevation of bench marks, the ancient levels which form terrace lines in some places along the distant hills, once a part of the shores of an ancient lake, the walls of the basin which once inclosed and held a fresh-water sea? It may have been, however, that the lake was never so deep as the figures thus added would indicate, and that instead of a lake or a series of lakes, there existed only a lagoon or chain of lagoons, connected or disconnected, according to the volume of water, which probably varied one season as compared with another; a system of shallow reservoirs, receiving the catchment or surplus water in periods or seasons of unusual rainfall, sometimes, after a prolonged and widespread storm of great severity, uniting and forming an extensive expanse a few feet only in depth, as was seen in the valleys of California during the notable winter of 1861-62. The rate of depression may have been such as to continue to keep the lagoons supplied, * * * and that only within a very recent period has this depressed portion of the Colorado basin become bare and dry. Are the phenomena which this vast and remarkable region exhibits * * * the result of catastrophic action, sudden, violent, and widespread, or the result of gradual changes moving slowly through countless centuries?"

At Salton fresh water shells are found in countless myriads, with recent species of marine shells, on the surface of the plain, 250 feet below sea level. Portions of the Dry lake are 300 feet below sea level. These minute fresh water shells are drifted into windrows in places, where they may be scraped up by the quart.

Along the eastern base of the San Jacinto mountains, an old beach line is well defined, and can be easily traced for miles. The rocks are worn and rounded up to this line, sharp and jagged above. This line by actual measurement has been found to be even with the present level of the sea.

Major W. H. Emory, in report of the United States and Mexican boundary survey, gave the following table of distances:

San Felipe to Vallecito, 17.85 miles.
Vallecito to Carrizo creek, 16.6 miles.
Carrizo creek to Big laguna, 25.41 miles.
Big laguna to New river, 5.83 miles.
New river to Little laguna, 4.5 miles.
Little laguna to Alamo Mocho, 16.44 miles.
Alamo Mocho to Cook's well, 21.84 miles.
Cook's well to Fort Yuma, 20 miles.

Dr. Charles Christopher Parry, botanist and geologist of the United States boundary commission, in reporting a reconnaissance made in 1849, wrote, concerning this region, as follows:

"On leaving the last rocky exposures to enter on the open desert plain, we pass, some distance down the bed of Carrizo creek; along the course of which are exposed the high bluffs of sand, marl and clay, exhibiting a fine sectional view of the tertiary formation on which the desert plateau is based. At the point where the road leaves the bed of the creek, to mount to the desert tableland, some 150 feet above, fossil marine shells of *Ostrea* are found, and gypsum makes its appearance in extensive beds. The upper layer of the tableland shows a variable thickness, composed of water-worn pebbles, derived from the adjoining mountains. Near the mountain base, this plateau has a height of about 500 feet above the level of the Colorado river. The surface extends in a gentle slope towards the Colorado, or eastward, about the distance of 25 miles, where it reaches its lowest depression at the lagoon or New river basin, which is in fact a part of the extended alluvial tracts belonging to the Colorado river."

The New river region receives the drainage of a large scope of country, which is sometimes visited by heavy showers. "It retains this rain-water, and river overflows, for several months; when both these sources fail, it becomes a perfectly dry bed, or contracts into quaggy saline marshes" (Parry). After a heavy rain or overflow there is a rank growth of grass, and other vegetation, while considerable portions sustain a heavy growth

of the mesquite. This affords fine grazing for stock, which cattle men have not been slow to appropriate.

Between the peninsula range and the Colorado river and the gulf lies a high mountain range, to the most northern and western point of which has been given the name of Signal mountain; this consists of a form of syenite, associated with recent lava. "Its surface is bare, and presents a forbidding outline of dark weathered rock, variously marked by furrows, and shows an irregular crest, gradually sloping towards the east." (Parry).

The Maricopas (of Arizona), the Cuchanos or Yumas, and the Cocopas are said to have originally formed one tribe. The Cocopa Indians reside within the limits of Mexico and the Yumas in United States territory. Major Heintzelman, in speaking of their agriculture, says: "It is simple; with an old axe, if they are so fortunate as to possess one, knives, and fire, a spot likely to overflow is cleared; after the waters subside, from the annual rise, small holes are dug at proper intervals, a few inches deep, with a sharpened stick, having first removed the surface for an inch or two, as it is apt to cake; the ground is tamped; if salt, rejected and if not the seeds are planted. No further care is required but to remove the weeds, which grow most luxuriantly wherever the water has been. They cultivate watermelons, muskmelons, pumpkins, corn, and beans. The watermelons are small and indifferent, muskmelons large, and pumpkins good; these latter they cut and dry for winter use. Wheat is planted in the same manner, near the lagoons, in December or January, and ripens in May or June. It has a fine, plump grain and well-filled heads. They also grow grass-seed for food; it is prepared by pounding the seed in wooden mortars made of mesquite, or in the ground. With water the meal is kneaded into a mass and then dried in the sun. The mesquite bean is prepared in the same manner, and will keep to the next season. The pod-mesquite begins to ripen the latter part of June; the screw-bean a little later. Both contain a great deal of saccharine matter; the latter is so full, it furnishes, by boiling, a palatable molasses; and from the former, by boil-

ing and fermentation, a tolerably good drink may be made. The great dependence of the Indian for food, besides the product of his fields, is the mesquite bean. Mules form a favorite article of food; but horses are so highly prized, they seldom kill them, unless pressed by hunger, or required by their customs."

Much the same methods are followed by the Cocopas today, as observed by the writer. They also visit the canyons opening on the desert from the west, and gather the sweet and edible palm fruits, there so abundant, and no doubt seek at times the pinyons or pine nuts in the forests at the summit of the peninsula range.

The townsite of Imperial is situated about 30 miles east of the old stage station on Carrizo creek, and here a new civilization, based on modern agricultural methods, is like to thrive where roamed the nomad in former time.

Dr. J. Le Conte, gave an interesting account of some volcanic mud springs or solfataras, near the Southern Pacific railroad, on the Colorado desert in Silliman's Journal (2d ser. XIX, Ja. 1855). Arthur Schott mentions a severe earthquake which occurred November 29, 1852, and quotes from manuscripts by Major Heintzelman, as follows: "There exists, about 45 miles below Fort Yuma, in the desert between the western Cordilleras and the Colorado, a pond, considered as an old orifice, which had been closed for several years. The first shock of an earthquake, in 1852, caused a mighty explosion. The steam rose a beautiful snowy jet more than 1,000 feet high into the air, where it spread high above the mountains, gradually disappearing as a white cloud. This phenomenon repeated itself several times in a diminishing scale. Three months later I visited the place; jets took place at irregular intervals, from 15 to 20 minutes. The effect was beautiful, as they rose mingled with the black mud of the pond. The temperature of the water in the principal pond was 118 degrees F., in the smaller one 135, and in one of the mud holes, from which gases escaped, 170. The air which escaped was full of sulphurated hydrogen, and in the crevices crystals of yellow sulphur were found. The

ground near about was covered with a white efflorescence, tinged with red and yellow. On the edge of a small pond crystals of sal ammonia, 1 to 5 inches long, were collected."

At the time of this earthquake low grounds near Yuma became full of cracks, many of which spouted out sulphurous water, mud, and sand. Dr. Parry records that the river formed new bends, leaving portions of its old bed so suddenly that thousands of fishes were left lying on the muddy bottom to infect in a few days the air along the river by their putrefaction, and that the frequency of earthquakes occurring here forms also a point in the mythology and traditional tales of the aborigines.

SOME DESERT FOSSILS.

AMNICOLA LONGINQUA Gid.

Shell elongate ovate, horn colored, surface quite smooth; apex obtuse; whorls 5, well rounded; sutures deep, aperture elliptical, broadly rounded posteriorly; lip simple, copiously incrusting the pillar margin, which is profoundly arcuate; umbilical region nearly perforate. Length one-eighth, breadth one-tenth inch.

Living: Utah.—Henry Hemphill.

Quaternary: Cienega Grande, Colorado Desert.—W. P. Blake, Lahontan basin, Lassen county, Calif., Nevada.

AMNICOLA PROTEA Gould.

Quaternary: Colorado Desert (Orcutt).

Melania exigua Conrad, Phila ac pr 7:269 (F 1855).—"Turreted; volutions 8, disposed to be angulate and somewhat scariform above; cancellated, longitudinal lines wanting on the lower half of the body whorl; columella reflected; aperture elliptical. Length, one-fifth of an inch. Colorado Desert, California.—Dr. Le Conte. The specimens are numerous and of a chalky whiteness, showing that they are all dead shells."

Living: Dos Palmas spring, Colorado Desert, near Salton (Orcutt).

The most numerous of all the fossil shells found on the desert, and though one of the smallest species, its numbers are so great as to exceed the others in bulk as well.

GNATHODON MENDICUS Gould.

Living: Colorado estuary to Mazatlan, Mexico.

Quaternary: North of Carrizo creek, Colorado Desert.—Le Conte.

PHYSA HUMEROSA Gid.

Living: Colorado river; Pyramid lake, Nevada; Pecos river, Texas.

Quaternary: Near Carson, Nevada. Very abundant on the Colorado Desert in a "semi-silicified" condition.

Virtually only a distorted form of *P. heterostropha*; evidently the same form occurs living in the Dos Palmas springs, Colorado Desert.

PLANORBIS AMMON Gould.

Shell large, discoid, subconic, delicately striate; left side broadly and deeply concave, showing 4 obtusely carinated whorls; right side concave, showing 2½ rounded whorls; aperture ovate triangular, sometimes quite expanded on each side; axis, five-eighths to one; diameter ¼ to ½ inch.

Living: Kiamath lake, Oregon. Honey lake, Lassen county, Calif. Nevada, Colorado river.

Quaternary: Cienega Grande, Colorado Desert.—T. H. Webb; W. P. Blake. Lahontan basin, Lassen county, California. TRYONIA CLATHRATA Stimpson.

Shell elongated, narrow; apex of spire acute; sutures deeply impressed; whorls 2, with generally about 12 longitudinal ribs crossing them, sometimes crossed by revolving striae or ridges, and angulated in the middle; aperture rounded oval, very small; diameter, 1.5; altitude 5 mm.

Quaternary: Dry lake, Colorado Desert.

ANODONTA CALIFORNIENSIS Lea.

CHAMA EXOGYRA Conr.

Conrad Phila ac J 1837, 256.

Living: Bodega bay, Calif. to Baja California. Mazatlan?

Quaternary: Santa Barbara to San Diego, Calif. Borrego springs, Colorado Desert (Orcutt). San Nicholas Island (S. Bowers).

RANELLA CALIFORNICA Hinds.

Hinds, Ann Nat Hist 11:255 (1843); Zool Sulphur 12, t 2, f 4, 5.

Keep, West coast shells, 44, f 24.

Living: Monterey, Calif. to Santo Domingo, Baja California (Orcutt).

Quaternary: Dead Man's Island, San Pedro, Calif. (S. Bowers). Borrego springs, Colorado Desert (Orcutt).

POMALAX UNDOSUS Wood.

Living: Santa Barbara, Calif. to Cape San Lucas.

Quaternary: Santa Barbara, Calif. to San Quintin, Baja California. Borrego springs, Colorado Desert (Orcutt).

PECTEN AEQUISULCATUS Cpr.

Living: Monterey, Calif. to Santo Domingo, Baja California (Orcutt).

Quaternary: San Diego, Calif. Borrego springs, Colorado Desert (Orcutt).

VENUS SIMILLIMA Sby.

Living: Monterey, Calif. to Santo Domingo, Baja California (Orcutt).

Quaternary: Santa Barbara, Calif. to San Quintin, Baja California (Orcutt). Borrego springs, Colorado Desert (Orcutt).

TIVELA CRASSATELLOIDES Conr.

Living: Santa Cruz, Calif. to Santa Domingo, Baja California (Orcutt).

Quaternary: Santa Barbara, Calif. to San Quintin, Baja California (Orcutt). Borrego springs, Colorado Desert (Orcutt).

OSTREA TITAN Conrad.

Miocene: Carrizo creek, Calif.

OSTREA HEERMANNI Conrad.

Miocene: Carrizo creek, Calif.

OSTREA VESPERTINA Conrad.

Ovate-subfalcate; lower valve plaited or ribbed; hinge long and wide, sharp

and somewhat pointed; ligament cavity wide, profound, minutely wrinkled; margins abrupt; cavity not very deep; muscular impressions large, impressed; upper valve flat, irregular; pallial impression cretulated.

Miocene: Carrizo creek, and near San Diego, California.

ANOMIA SUBCOSTATA Conrad.

Obtusely ovate, rather thick; umbo of larger valve ventricose; hinge thickened, surface of the valve obtusely undulated concentrically, and marked with waved, wrinkled, interrupted ribs, much raised, except towards the base, where they are larger and somewhat tuberculiform; upper valve entire, or with obsolete radii towards the base.

Miocene: Carrizo creek, San Diego county, Calif.

OCINEBRA POULSONII Nutt.

SOLECURTUS CALIFORNIANUS Conr.

PECTEN DESERTI Conrad.

Miocene: Carrizo creek, Calif.

EDITORIAL.

The year 1900 has seen the addition of 140 pages to the volumes of the West American Scientist—far less than we had hoped but not a bad showing in the face of the difficulties we have met with.

It is our purpose to bring together in these pages descriptions of all the animals, plants, minerals, etc. of the west, together with notes of economic and geographic significance, bibliography, synonymy, etc.

The cooperation of our readers is invited, and our services in turn we offer in determining names of minerals, shells, and plants, or in any way that may tend to increase interest in these branches.

BOOKS.

MURRAY, D. A.: Atoms and energies. 1901. 202 pp. \$1.25 cl. Introduction by Prof. Frederick Starr.

An interesting discussion in physical science, aiming at simple explanations of phenomena little understood, rendering them less mysterious to the average student; "his assumptions not antagonistic to facts, but aid in the explanation of them".

New York, 150 Fifth ave.: A. S. Barnes & Co.

HARPER, GEORGE W.: How to determine and classify our common rocks. 14 pp. 10c.

REMARK, FERDINAND:

—Der Kakteenfreund, 32 p. 34 f. 50c.

HIRSCHT, KARL:

—Kakteenkulturen im Hause und ihr

Wert. 1896. 32 p. 1 f. 50c.

RUMPLER, THEODOR:

—et Karl Schumann: Die Sukkulenten. Berlin 1892. 263 p. 139 f. \$3.

LABOURET, J.:

—Monographie de la famille des Cactées.

Paris. 684 p. 1853.

SHIMCK, B.:

—The distribution of forest trees in Iowa.

Ia ac pr 7:47-59. Reprint. 1 map. 20c.

EATON, ELON HOWARD:

—Birds of Western New York. Rochester

ac pr 4: 1-64. F 1901.

PECK, CHARLES H.:

—Report of the state botanist on edible fungi of New York. Memoir N. Y. state museum 3: 129-234. t 44-68. n 1900.

From the author.

WATTS, W. L.:

—Oil and gas yielding formations of California. State mining bureau b 19. 236 p. Illustrations and maps.

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MINERALS.

Twelve years ago the writer contributed to the San Diego Union a brief annotated list of the minerals then known in San Diego county. The county has since been divided into two, but more, rather than less, territory is now tributary to San Diego, hence the present list will not be confined to the arbitrary limits of the county, but to the territory naturally tributary to our bay.

ACHROITE (colorless tourmaline)—Of gem quality, has been discovered in San Diego county, California, associated with other lithia tourmalines.

ACTINOLITE—Abundant in the Colorado desert.

AGATE—Occurs in various forms in Southern California, but not in commercial quantity. The world's supply is principally received from Uruguay and Brazil, which is mainly cut and polished in Germany.

ALABASTER—An abundance of apparently good quality of this form of gypsum occurs on the Colorado desert, and in Baja California.

ALLANITE—Named for T. Allen, who discovered it among minerals from East Greenland, contains the rare metals cerium, didymium, glucinum, lanthanum, and yttrium, together with alumina, silica, lime, and iron, with traces of magnesium, manganese, soda, copper, and water. This occurs in Pennsylvania, New Jersey, and in Southern California.

ALMANDITE—Red garnets are not rare in the California placer mines. Some few crystals of gem value have been produced in San Bernardino county; the finest having been valued as high as \$50 apiece. In the placer mines in Lower California the garnets were formerly saved, and sold for \$5 per pound—being popularly called rubies—like the garnets of Arizona and New Mexico, which are said to be much superior to the "Cape Rubies" by artificial light.

ALUM—See kalinite.

AMAZONSTONE—A beautiful semiprecious stone of the feldspar group; the finest specimens of which come from Pike's Peak, Colorado. Has been reported from Baja California, but I have seen no specimens in proof.

AMBER—See succinite.

AMBLYGONITE—Associated with lepidolite in the lithia mines of the county.

AMETHYST—Deep purple, bluish violet fading almost into pink, crystalline variety of quartz. Colorado yields many fine specimens. May be expected to occur in some of the mines of the Colorado desert.

ANGLESITE—Sulphate of lead has been reported from the Colorado desert in some abundance; composition about 73.6 per cent aside of lead, and 26.4 per cent sulphuric acid.

ANTIMONY—An ore carrying about 38 to 40 per cent of this metal, and from \$5 to \$30 per ton in gold, occurs near San Diego, and awaits development.

ANTONITE—A talc-like mineral, discovered in a copper mine at San Antonio, Baja California, not far from Todos Santos bay. It was formerly shipped to New York and used in the manufacture of decorative papers.

Dr. E. O. Hovey, of the American Museum of Natural History, writes:—

"I find no such name as antonite in Dana's System of Mineralogy, 1892, 6th ed., or in the Appendix thereto, 1899, or in Foote's Complete Mineral Catalogue, 1899. The mineral on merely superficial examination looks to me like some form of sericite."

ARGENTITE—Silver glance is composed of about 87.7 per cent silver and 12.9 per cent sulphur. One of the most valuable of silver ores.

APATITE—Phosphate of lime has been reported from the property of the San Jacinto tin mining company.

ASBESTOS—A four-foot vein seven miles east of Elsinore, Cal., has been worked to a considerable extent, and the product manufactured into boiler covering, etc. Other deposits exist in the mountains bordering the Colorado desert on the west, but the demand on this coast seems not to justify their development at present.

ASPHALTUM—Occurs native at various points along the coast from San Diego northward. California produced in 1896 nearly 75,000 tons, worth about half a million dollars.

The notion of making asphalt artificially from herrings and sawdust seems so

extraordinary as to suggest burlesque. Nevertheless, this surprising feat has been accomplished by Prof. W. C. Day.

ATACAMITE—A native exychloride of copper, originally found in the form of sand, in the desert of Atacama, between Chili and Peru. A specimen received of Emiliano Ybarra from a mine near Calmalli, Baja California, is identified as this species.

AZURITE—"Mountain blue" (blue carbonate of copper) occurs sparingly in some of the copper mines of Southern California. One of the most beautiful of copper ores, magnificent specimens of which have been produced by the copper mines of Arizona. Composition about 69.2 per cent copper oxide, 25.6 per cent carbonic acid, and 5.2 per cent water.

BARITE—Barytes or heavy spar is composed of about 65.7 per cent baryta and 34.3 per cent of sulphuric acid. The present supply in the United States is excessive of the demand.

BERYLS—Quite equal to those from the Ural mountains have been produced in Maine and North Carolina. Their occurrence in San Diego county has recently been predicted.

BRAZILIAN EMERALD—The emblem of the Brazilian clergy, is not an emerald proper, but a green colored tourmaline. A few green tourmalines have been found in San Diego county, in the lithia mine at Pala, and in several other localities, some of them of the finest gem quality. One beautiful specimen showing a perfectly flat termination, is banded green at the end, then a band of achroite shading into rubellite where fractured. Another specimen is green at the center, with a thin outer crust of black.

BIOTITE—Black mica occurs in various localities in Southern California and in Baja California.

BOLEITE—A rare mineral described from the copper mines at Santa Rosalia, Baja California, on the west coast of the Gulf of California. Occurs in perfect cubes.

BORAX—Originally obtained from a lake in Thibet; composition about 36.6 per cent boric acid, 16.2 per cent soda, and 47.2 per cent water. Of a white color, sometimes grayish, or with a shade of blue and green. The deserts

of California and Nevada produce annually about half a million dollars' worth, the product in 1896 being 13,508,000 pounds, worth \$675,400.

CALCITE—Carbonate of lime, consisting of lime and carbonic acid. Rhombohedral in crystallization. Includes marble, limestone, calcareous tufa, etc. The cement rock of San Diego county (notably in Jamul valley) is a form of calcite, especially adapted for the manufacture of cement. Thynolite, occurring on the Colorado desert, is another form.

Limestone occurs abundantly in various places in Southern California, and is mined at Colton and San Jacinto.

Marble occurs in San Diego county in various colors, but the quarries are as yet wholly undeveloped. Some delicate yellow marble—the most highly prized color among the ancients—occurs on the Colorado desert.

Ophiolyte, or Verd-Antique marble, occurs on the Mojave desert, where large quarries of this beautiful and highly prized ornamental stone have been partially developed.

CASSITERITE—Tin stone from Cornwall, England, is composed of 78.6 per cent tin, and 21.4 per cent oxygen. It occurs in the Black Hills, South Dakota, at Temescal, Riverside county, California, and near San Diego. The two latter localities may yield specimens equal to that from Durango, Mexico, which is polished as a gem.

CERARGYRITE—"Horn silver" (chloride of silver), composed of about 75.3 per cent silver, and 24.7 per cent chlorine, weighs 345 pounds per cubic foot, 5.8 cubic feet making a ton.

CHALCEDONY—An uncrystallized translucent or clouded variety of quartz, white, yellow, brown or blue (usually whitish), having a luster nearly like wax. When arranged in stripes or layers of different colors it constitutes agate; and if the stripes are all horizontal, it is called onyx. Portions of the Colorado desert in San Diego county are strewn with water-worn fragments of chalcedony of different colors, acres of the mesa-like formation, near the boundary line between the United States and Mexico, being covered with pebbles of every conceivable color and as smoothly laid as a piece of mosaic work.

CHALCOPYRITE—Copper pyrites exist in large deposits in Baja California, and a mine of this ore is now being developed near Encinitas.

CHRYSOCOLLA—Silicate of copper, composed of 45.2 per cent copper oxide, 34.3 per cent silica, and 20.5 per cent water. Beautiful specimens of this ore occur on the Colorado desert, near the Colorado river, and in Lower California. It is sometimes mistaken for turquoise.

CHRYSOPTASE—The locality near Visalia, Cal., yielded to the value of \$400 in 1896, more than half of it for cutting, the rest for specimens. Chrysoprase is a translucent, pale bluish-green or yellow-green chalcedony.

CINNABAR—Composition 86.2 per cent mercury, 13.8 per cent sulphur, weighing 549 pounds per cubic feet per ton. This is the principal ore of quicksilver, and has been reported from Riverside and San Diego counties, but I have seen no specimens in proof. The writer has five specimens from two distinct sources, alleged to have been found in Baja California. The industry in this county is practically confined to California, the product in 1896 being reported worth over one million dollars.

CORUNDUM—Reported from Los Angeles county by Dana.

CUPRITE—Red oxide of copper; red copper; reported from the Colorado desert.

CYANITE—Large quantities of small crystals occur in the Cargo Muchacha district, on the Colorado desert. None of gem value have been yet discovered.

DENDRITE—“Footprints of the fern”; some beautiful specimens have been collected on the Mojave desert, by Mr. Ira J. Gray.

DIAMOND—A small stone was reported in 1898 as having been found in Baja California, about 50 miles south of Ensenada. Diamonds have not been found in such numbers and size in California as to render the search for them profitable, but no serious prospecting for them has yet been attempted. Itacolumbite or flexible sandstone, an alleged native of the diamond has been reported from San Diego county.

DUMORTIERITE—Reported by Durden as occurring 25 miles from Ogilby, on the Colorado desert.

A beautiful variety is found near San Diego.

EMERALD:

True emeralds have been found in North Carolina.

EPIDOTE—The United States produced \$250 worth of this semi-precious stone in 1895. Crystals in masses have been obtained by the writer near the Alamo, and associated with crystals of calcite from near the coast south of Santo Tomas, Baja California.

ERYTHRITE—Occurs at the Kelsey mine, near Compton, Los Angeles county, Cal., associated with an ore of silver and of cobalt in dark colored earthy masses in a gangue of heavy spar. This occurrence was noted in 1881, and is described in the report of the state mineralogist for 1882, page 207, and in the fourth report, page 279.

FLUORITE—Colorado desert, in a massive form.

GALENA—Lead sulphide, composed of about 86.6 per cent lead, and 13.4 per cent sulphur, is one of the heaviest known ores, weighing 461 pounds per cubic foot, 4.34 cubic feet making a ton. It occurs in considerable abundance in some portions of the Colorado desert, carrying a greater or less quantity of gold and silver.

GARNET—See Almandite.

GILSONITE—A hydrocarbon, reported from Utah and Southern California.

GRAPHITE—Plumbago or black lead is a carbon like the diamond, with some iron oxide and clay. A good quality of this mineral occurs near the Jacumba valley, in San Diego county, California, in some abundance, but remains undeveloped. It also occurs in other parts of the country, but not in sufficient quantities to be of any commercial importance.

GYPNUM—Sulphate of lime, when pulverized the plaster of paris, of commerce; when crystallized known as selenite; the finer granular variety is known as alabaster. Composed of about 32.5 per cent lime, 46.6 per cent sulphuric acid and 20.9 per cent water. Very abundant near Riverside, on the

Colorado desert and Baja California.

HALITE—The salt fields of the Colorado desert, of San Quintin bay, and of Scammons Lagoon, Baja California, ensure San Diego an abundant supply aside from her own product, and promise to add considerably to our commerce.

HEMATITE—This iron ore occurs sparingly on the Colorado desert, in greater abundance on the Mojave desert and in Baja California, where the writer obtained some fine specimens of hematite in quartz in the Santo Tomas valley.

HYALITE, or Muller's glass—A variety of opal, is described by T. Beck as occurring in Beaver valley, Utah. A fine quality of this stone occurs near San Diego.

INDICOLITE—Blue tourmalines are reported as occurring in San Diego county.

ITACOLUMNITE—Flexible sandstone has been reported from the Jacumba valley, but has not been seen by the writer.

JASPER—Baja California.

JET—A fine black jet, evidently in some quantity, is reported from the vicinity of Santa Fe, New Mexico.

KALINITE—Alum occurs in considerable abundance in the sulphur mines of Baja California, especially in the region of the Cocopah mountains.

KAOLINITE—The kaolin found at Cajon mountain, now being independently tested by the owners of the numerous claims, has attracted considerable attention, and so far seems to meet with favor. An analysis by H. Boedtker & Co., gave the following result: Silica, 62.30 per cent; alumina, 20.50 per cent; iron (trace) .00 per cent; lime, 2.20 per cent; magnesia, .25 per cent; water, 11.60 per cent; moisture, 3.10 per cent. Rational analysis: Clay substance, 67.2 per cent; feldspar, 15.6 per cent; quartz, 17.2 per cent.

LEPIDOLITE—Lithia mica occurs in an immense deposit near the old mission at Pala—probably the largest and richest lithia mine in the world—upon which about \$4,000 were expended in development work during 1899. Lithia of American production—the product of this mine—was for the first time placed upon the market, and thus a new American industry inaugurated at

the close of the century.

LEUCITE:

The history of leucite is very interesting. Some 30 years ago Humboldt made the general statement that leucite occurred nowhere outside of Europe. Curiously enough, until within a few years this statement held good. In 1874, however, Vogelsang found it in an Asiatic basalt, and in 1876 Zirkel announced its discovery in Wyoming.

'Another extra-European locality for leucite is now announced by Von Chrustschoff, who finds it in a lava in the vicinity of the extinct volcano Cerro de las Virgenes in Baja California. The rock consists of an ash-gray ground mass sprinkled with rounded spots of brownish-black obsidian or glass, and with light specks of leucite. These light specks are shown by a lens to have a rounded octagonal outline.

'The leucite is remarkably clear and fresh, and shows in polarized light the well known twining structure, even better marked than in leucite of the Vesuvian lavas or of the Laacher-See. While generally in rounded masses, the smaller individuals are often clearly octagonal in outline. The microscope shows the leucite to contain many inclusions, among which are augite, apatite, olivine, plagioclase, magnetite, nepheline, and glass inclusions and bubbles.'—H. C. Lewis, reprint in *W. Am. Sci.* ii. 33.

LIGNITE—A vein 4 feet thick, 12 miles north of San Diego, was reported by Dr. Le Conte years ago, but seems to have been since lost sight of and remains undeveloped.

LIMESTONE—About 11.5 cubic feet weigh a ton, or 174 pounds to the cubic foot. See calcite.

LIMONITE—Elsinore, Cal.

MAGNETITE—Occurs eight or nine miles north of Mesquite station, on the Colorado desert. I have also found magnetic iron ore in the mountains north of Salton; in the Encantada mine near Alamo (rich in gold), in the Santo Tomas valley, and at San Ysidro, Baja California.

MALACHITE—Green carbonate of copper, composed of about 71.9 per cent copper oxide, 19.9 per cent carbonic acid and 8.2 per cent water, forms the most beautiful of copper ores, at times becoming a semi-precious stone. The finest specimens are probably found in the Ural mountains, but magnificent masses have been mined in Arizona, and it usually occurs in copper mines where azurite, chrysosolla or cuprite are present, in the Colorado and Mojave deserts, and in Baja California.

MICA—The mica of commerce is a form of muscovite, but no mine in San Diego county has yet become a producer. See biotite, lepidolite, and muscovite.

MOLYBDENITE—Composed of 60 per cent molybdenum and 40 per cent of sulphur; a soft, black lustrous, foliated mineral, often mistaken for graphite. Occurs sparingly in granitic veins near the Jamul and Jacumba valleys and at Campo, in San Diego county, and in Baja California, but not yet known to occur in this region in paying quantity. The United States produced this mineral for the first time commercially in 1898—about 10 tons, worth \$50 per ton.

MUSCOVITE—Common throughout the granitic formations.

ORTHOCLASE—Feldspar is not rare near Ballena, and occurs at Julian and in Baja California in considerable quantity, and of a quality suitable for the manufacture of fine ware.

OBSIDIAN—Reported to occur in immense quantities near the head of the Gulf of Cortes, in Baja California. I have found small fragments in San Diego county, evidently brought from a distance by the Indians, who valued volcanic glass for the manufacture of arrow and spear points.

OPAL—Occurs on the Colorado desert, and also credited to the limits of the city of San Diego, but only the inferior varieties are yet known in California. Banded opal has been described as occurring in Beaver valley, Utah, some three miles from Granite Peak. See hyalite.

PECTOLITE—"A silicate of aluminum, calcium, and sodium." Has been reported as occurring in Southern California.

PERIDOT—New Mexico.

PLATINUM—This metal is found only in metallic condition, sometimes alloyed with iridium or osmium. A nugget weighing nearly two pounds (only $2\frac{3}{4}$ x 3 inches in size) from Colombia, South America, has been reported as the largest in America, with an intrinsic value of \$350. It contained 85 per cent pure platinum and 15 per cent of gold, palladium and rhodium, and had a bluish-white lustre. This metal is almost as soft as copper and as ductile as gold. It can be rolled so thin that a thousand sheets in a pile would not exceed an inch in height.

PLUMBAGO—See graphite.

PREHNITE—San Ysidro, Baja California, associated with calcite.

QUARTZ—A cubic foot weighs 162 pounds, 12.34 cubic feet making a ton. Occurs in an endless number of varieties. See agate, carnelian, chalcedony, jasper, etc.

Rose quartz in magnificent masses has been found by the writer near Mesa Grande.

Silicified wood occurs in various parts of San Diego county, but in the greatest abundance and variety on the Colorado desert; while Arizona is noted for its Chalcedony park, where an entire forest is preserved in a beautiful agatized form.

Diatomaceous earth occurs on the sea coast near San Diego.

RHODONITE—"Between San Diego and Colton."

RUBELLITE—Beautiful radiations and masses of crystals of pink tourmaline occur in the lepidolite at Pala. A few crystals of gem quality, resembling those from the Isle of Elbe have been found in the county. The largest crystals measure two inches in diameter.

RUBY:

The so-called rubies of the placers of Baja California are not true rubies but only garnets, and seldom of value as gems.

True rubies occur in N. C. and S. C.

RUTILE—This rare mineral was discovered by the writer at Mesa Grande

SALT—See halite.

SCHORL—Black tourmaline; quite common in San Diego county and in Baja California, disseminated through

quartz or feldspar. Crystals six inches in diameter have been observed.

TALC—A foliated variety occurs at Elaine, Cal. See antonite.

TOURMALINE—See achroite, Brazilian emerald, indicolite, rubellite and schorl.

TURQUOISE — Reported from the Colorado desert, but no specimens have as yet been seen by the writer. Certain copper ores are easily mistaken for this stone. Mines of this gem of great extent are being worked in the Mojave desert region northwest of Vanderbilt.

WULFENITE—Very fine crystals of molybdate of lead were obtained by the writer in 1888 from some of the mines north of Salton, in the Colorado desert.

METALS MORE PRECIOUS THAN GOLD.

The value in 1898 per gram is given — as quoted in the European market.

Barium, \$5.71

Beryllium, crystals, \$9.04

Boron, crystals, \$1.43

CAESIUM—A rare metal contained in minute quantities in lepidolite. It would prove useful if an available supply existed.

Calcium, \$4.28

Cerium, \$2.02

Didymium, \$2.81

Erbium, \$3.06

Gallium, \$615 per grain.

Germanium, \$35.70

Glucinium, \$9.04

Indium, \$4.05

Iridium, \$1.19

Lanthanum, powder, \$4.28

Lithium, \$2.38

Niobium, \$3.81

Osmium, \$2.87

Palladium, \$761 per kg. for sheet and wire.

Rhodium, \$2.87

RUBIDIUM—One of the rare metals, more precious than gold, occurs as a by-product of the lithia mines.

Ruthenium, \$1.55

Strontium, \$6.19

Tantalum, \$3.57

Titanium, \$7.71

Vanadium, \$1.43

Yttrium, \$3.33

Zirconium, \$0.71

PERIODICALS.

FARM AND FIRESIDE:
SENTINEL: Ramona, Cal.
VERMONT JOURNAL: Windsor, Vt.

BIOGRAPHICAL.

ROTHWELL, RICHARD P.
Died April 17, 1901. Editor for years of the Engineering and Mining Journal, and of the annual mining publication, Mineral Industry, and well and favorably known in every civilized country where mining exists.

MAGAZINES.

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L. W. STILWELL. Deadwood (Black Hills), South Dakota. 8

COPPER is KING

[Abstract of a report by a mining engineer on a group in our hands for sale]

One claim of 20.66 acres, patented.
Four contiguous claims, unpatented.
Total area: 88 acres, 4,533 square feet.
Located on the west side of the Penos Altos range, Penos Altos mining district, Grant county, New Mexico, 2 miles west of the town of Penos Altos, and 8 miles north of Silver City, the county seat and railroad station. Altitude, 7,500 feet. Altitude of Silver City, 6,000 feet.

Good roads from Silver City to the mines.
Permanent water on the mines for camp use; sufficient to run a large smelting plant can be developed at a small expense.

Porphyritic-syenite hanging and foot walls, with quartzite, porphyry, syenite, dolomite (lime), porphyllite, iron and quartz alternating between the several ore bodies. The ore bodies vary in width from 2 to 150 feet each, iron capped and in places quartz. The surface shows the copper ore in bunches in the strata varying from 1 to 10 feet wide. The character of the ore is copper-iron carbonates, showing a little native and oxides of copper, and copper sulphides below the water level, the latter carrying a large percentage of iron and zinc at the south end of the ground, where a tunnel is run. The zinc only shows at this end and will disappear at depth, as is evidenced nearby.

Ores free smelting, 3 to 60 per cent. copper, containing lime in a few places adjoining dolomite wall. Shipments of ore average 8 to 13 per cent. copper, iron and silica neutral.

Ore can be marketed at the Silver City reduction works.

Cost of mining, assaying and hauling to Silver City estimated at \$6 per ton on small shipments; smelting charges \$6 per ton. On large shipments, after development, the cost will be reduced 25 per cent.

Net profit per ton (on a 10 per cent. ore) estimated at \$13.

A 3 per cent. copper ore can be smelted on the ground and marketed in the east at a profit.

This great deposit has the same geological and mineralogical characteristics of the mines of Clifton, Arizona, and the Copper Queen mine, of Bisbee, Arizona. Copper in this formation does not play out, but gets richer and better defined as depth is attained, the ore existing in surface bunches and chambers, and ore shoots below the water level.

The trend of the ore bodies and formation is N. E. Surface dip of ore bodies is 30 to 40 degrees N. W. from the vertical towards the vertical hanging wall. Development shows the same to be both vertical and dip S. E. into the mountain at depth.

Very little gold and silver is found in these surface ores. Silver 6 to 7 oz.; gold 6 to \$3 per ton.

Surface workings, outs, shafts and tunnels, from 5 to 100 feet each in length or depth, have been made by old-time gold hunters; and the present owners in mining surface ores, which show the formation, ore bodies in place, and their permanency.

A 20-foot open cut, and 220 feet of tunnel, crosscutting 3 ore bodies on the south end of the copper, extending below water level, has been made; approximate depth attained, 125 feet.

Very little timbering will be required. Pine, oak and juniper wood for all purposes on the ground. Wood can be purchased for \$2 per cord.

This group of copper mines embraces the only fluxing copper ores in the district. The expenditure of \$1,000 in development will probably open up pay ore bodies of chalcopyrite in the extension of the tunnel.

Price, \$50,000; six months' developing bond; shipping privileges.

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Hopkins laboratory contr 4 & 16

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ORCUTT, San Diego, California.

OIL

The editor reported to the State mining bureau in 1890 (10th report, 905), on the Colorado Desert:— 'The formation in certain sections seems very promising [for the producing of petroleum].

About half a million acres have been taken up for oil in the past few months. The editor is in a company claiming over 20,000 acres. Yes, stock will soon be for sale. Land also.

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July 23, 1901

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BIOGRAPHICAL.

Le CONTE, JOSEPH:

One of the most eminent scientists, of the University of California, died July 6, 1901.

Shells of western Lake and Stream.

ACROLOXUS NUTTALLI Hald.

Keep, West Coast shells, 115, f 102.
Shell fuscous, oval, elevated, apex $\frac{1}{4}$ of the entire length from one end. Length 8, width 6.25, height 3 mm.

Living: Snake river, Idaho; Oregon; Washington.

ANCYLUS ALTUS Tryon.

Shell somewhat oblong, broadly rounded at one end, more narrowly so at the other; convexly much elevated, apex obtuse, subcentral, texture delicate, surface rather smooth. Length 8, width 6, height 4 mm.

Living: Klamath river, California.

ANCYLUS CAURINUS W. Cooper.

Living: Black river, Puget Sound, to Sierra Nevada mountains, California.

Considered by Tryon as identical with *A. fragilis*.

ANCYLUS CRASSUS Hald.

Shell coarse, somewhat ponderous, ovate, elevated; lines of growth conspicuous; apex eroded, placed far back; anterior and lateral slopes convex, posterior slope steep and rectilinear. Color opaque chestnut-brown. Length 8, width 6.25,

height 3 mm.

Living: Oregon (Nuttall).

ANCYLUS FRAGILIS Tryon.

Shell very fragile, sides nearly parallel or slightly incurved in the middle, diverging anteriorly; ends rounded, apex elevated, acute, curved backwards, with about two-thirds of the shell anterior to it. Length 4, width 1.5, height 1 mm.

Living: Vallejo and coast region, California.

ANCYLUS KOOTANIENSIS Baird.

Shell ovate, ashy, concentrically striate, vortex anterior, obtuse, shining within. Length 9, width 6 mm.

Living: Kootanie and Spokane rivers, British Columbia.

ANCYLUS NEWBERRYI Lea.

Shell obtusely pyramidal, dark, reddish-brown, slightly compressed at the sides; apex subcentral, aperture elliptical. Length 13.8, width 10, height 5 mm.

Living: Klamath lake, Pitt river, California; Oregon.

ANCYLUS UNTTALLI Hald.

Living: Oregon.

ANCYLUS PATELLOIDES Lea.

Shell thick, elliptical, spotted, obliquely conical; striae minute, crowded; apex submedial.

Living: Arroyo San Antonio (Trask); Santa Cruz; Canoe creek; San Francisco; upper Sacramento river, California. Oregon.

ANCYLUS SUBROTUNDUS Tryon.

Shell very fragile, oval, nearly round; convex, but little elevated; apex obtuse, nearly central. Length 8, width 6.5, height 3 mm.

Living: Umpqua river, Oregon.

BYTHINELLA BINNEYI TRYON.

Shell elongated, 4-5 whorls, apex somewhat obtuse; aperture ovate or nearly suborbicular, both margins rounded; umbilicus very small. Color light horn, translucent. Height 3, diameter 1.6 mm.

Living: Bolinas; Martinez; Santa Cruz; Campo, San Diego county (Orcutt), California.

BYTHINELLA HEMPHILLI Pilsbry.

Shell very slender, about the shape of *Carychium exiguum*. Apex obtuse, whorls 5, convex, the last imperforate. Aperture ovate, about one-third the length of the shell; peristome continu-

ous, its plane oblique to the axis of the shell, the base of the lip being advanced. Color corneous, often encrusted with a black ferruginous deposit. Height 2.4, diameter 1 mm.

Living: Snake river, Washington (Henry Hemphill).

Pilsbry, Nautilus 4: 62-64.

RYTHINELLA INTERMEDIA Tryon.

Shell elongately turbinated, of over 4 very convex whorls; spire elevated, suture profound, apex obtuse; body whorl well rounded; aperture small, nearly round; umbilicus narrow. Color dark green. Height 5, diameter 3.3 mm.

Living: Owyhee river, southeastern Oregon. Springs, Cuyamaca mountains east of San Diego, California (Orcutt).

CARINIFEX NEWBERRYI Lea.

Keen, West Coast shells, 115, f 104.

Shell light horn color, turreted, very minutely striated, above and below acutely carinated, broadly and deeply umbilicated, whorls 5, flat above, sloping convex below; aperture large, subtriangular.

Living: Klamath lakes, Oregon, to Owens river and Clear lake, California. Nevada. Utah.

COCHLIOPA ROWELLI Tryon.

Shell depressed, wider than high, whorls 3½, regularly convex, rapidly enlarging; spire small, slightly elevated, apex acute, sutures well marked; base convex, except that region around umbilicus is flattened and inclined toward the axis, its outer boundary marked, thus by an angle; umbilicus small, very distinct; aperture half ovate, labrum well rounded, thin, labium slightly rounded, thickened, elevated from body whorl forming an acute angle with the labrum above, and not impinging on the umbilicus. Color yellowish-green. Operculum pauciserial. Height 2½, larger diameter 4, smaller 3 mm.

Living: Clear lake, California? Panama?

FLUMINICOLA FUSCA Haldeman.

Globose, smooth, whorls 5, rapidly increasing; sutures very deeply impressed; aperture large, broadly ovate, columella thickened. Color horn to light greenish. Height 10, diameter 8.6 mm.

Living: Sacramento river, California. Green river, Utah. Oregon. Wyoming. Dakotas.

FLUMINICOLA HINDSI Baird.

Keen, West Coast shells, 63.

Living: Kootane river, Montana.

FLUMINICOLA NUTTALLIANA Lea.

Keen, West Coast shells, 63, f 50.

Shell globosely turbinate, thick, whorls 4 (apex generally eroded), convex, sutures well impressed; aperture large, widely ovate. Greenish, aperture blue within. Height 10 diameter 8.3 mm.

Living: British Columbia; Sacramento river, California.

FLUMINICOLA VIRENS Lea.

Keen, West Coast shells, 63.

Shell oval, thick, apex eroded, whorls 4½-5, moderately convex; aperture narrow-ovate. Bright green, bluish within.

Height 10, diameter 6 mm.

Living: Oregon and northern California.

GUNDLACHIA CALIFORNICA Rowell.

Aperture suboval, obliquely expanded towards the left, posteriorly rounded, and wider anteriorly. Internal shelf reaching forward about one-fifth the length of the shell, its margin slightly concave and oblique. Dorsal surface convex, becoming somewhat keel-shaped towards the apex, which is strongly and obliquely deflected so as to make the right border nearly a straight line, while the expansion on the left projects nearly as far back as the apex at an obtuse angle. Structure corneous, with strong concentric lines of growth and faint radiating striae. Color dark brown, opaque; inner surface shining and purplish, the plate white towards the edge, and in some specimens showing a thickened, white semicircle continuous with its margin across the arch of the shell. Length 4, width 2, altitude 1.5 mm.

Living: On stems of plants growing in stagnant ponds, California, often two or more on the back of another.

LIMNAEA ADELINAE Tryon.

Shell thin, semi-transparent, body whorl large, wide, convex; spire small, consisting of 5 convex volutions, attenuating rapidly to an acute apex, sutures impressed; inner lip thin, reflected, but not covering the umbilical fissure, which is narrow; columella twisted; color light horn, polished within the aperture, outer lip tinged with red within. Length 14, diameter 8.5 mm.

Living: San Francisco; San Diego (Orcutt), California. Tijuana, Baja California (Orcutt).

LIMNAEA BULIMOIDES Lea.

Living: Upper Missouri river to Columbia river. San Diego, California.

LIMNAEA CAPERATA Say.

Living: New York; Massachusetts; Michigan; to Hudson bay, and northern California.

LIMNAEA EMARGINATA Say.

Shell ovate-conic, thin, translucent, smooth; lines of growth very fine; whorls 5, very convex, suture deep; apex acute when present; aperture wide, more than ½ the length of shell; labium turned over, so as to form an umbilic; fold on columella obsolete; columellar depression deeply emarginate. Color light ochraceous.

Living: Maine; Lake Winnipeg; Washington?

LIMNAEA HUMILIS Say.

Living: Throughout the United States. Baja California (Orcutt). Vancouver Island.

LIMNAEA LEPIDA Gould.

Living: Columbia river, to Antloch, California.

LIMNAEA PALUSTRIS Mueller.

Living: Circumboreal; Mountain lake, California; New Mexico.

LIMNAEA STAGNALIS L.

Living: Europe; Siberia; Ohio to Oregon; California.

NERITINA PICTA Sby.

Cooper, Cal ac pr 2d ser, 3:103.
Living: Guaymas (Orcutt). Todos Santos creek, Baja California (L. Belding).

PHYSA AMPULLACEA Gould.

Shell ovate-ventricose, shining, horn-colored; spire elevated, acute; whorls 6, last one inflated; suture decidedly impressed; aperture broadly ovate, five-sixths the length of the shell; lip thin, submargined with red; columella quite flexuous, covered with callus. Length 25, diameter 13 mm.

Living: Lake Oyosa, Washington; Oregon.

PHYSA DIAPHANA Tryon.

Cooper, Cal ac pr 2d ser, 3:103. Zoe 1:196.

PHYSA DISTINGUENDA Tryon.

Shell variable in outline, sometimes cylindrical, sometimes more inflated, lengthened; spire some longer than in *F. malleata*; whorls convex, suture well impressed; surface malleated, crowded with growth lines; aperture long, narrow, rather wider below, columella long, narrow, white, almost without fold, turned a little to the right below. Length 13, diameter 7 mm.

Living: Marysville, Stockton, San Diego, California. Tijuana, Baja California (Orcutt).

PHYSA GABBII Tryon.

Shell thin, closely striated by the lines of growth; body whorl inflated, its upper half flattened, so that the lip appears angulated in the middle; spire moderate, apex acute, whorls 6, convex, with distinct sutures. Color light corneous, very much polished within; lip margined with red. Length 25, diameter 13 mm.

Keop, West Coast shells, 119.
Living: Mountain lake; Santa Ana river, California. Baja California.

PHYSA HUMEROSA Gld.

Shell subrhomboidal, solid, smooth and white; spire acute; whorls 5, tabulated; aperture one-half to two-thirds length of shell, rounded posteriorly; labrum expanded; columella scarcely plicate, callus hardly perforate. Length 15, diameter 9 mm.

Living: Colorado river; Pyramid lake, Nevada; Pecos river, Texas.

Quaternary: Near Carson, Nevada. Very abundant on the Colorado Desert in a "semi-silicified" condition.

Virtually only a distorted form of *P. heterostropha*; evidently the same form occurs living in the Dos Palmas springs, Colorado Desert.

PHYSA LORDI Baird.

Shell thin, corneous, tumid, gibbous, aperture large, outer lip acute; external surface very minutely decussated; whorls 6, first 2 minute, tinged with black, the last swollen, 4 times the size of the others. Length 19-25, diameter 12-18 mm.

Living: Lake Osyoos, British Columbia, Washington. Humboldt lake Nevada.

PHYSA TRASKII Lea.

Shell very much inflated, somewhat oblique striate, semi-transparent very thin, pale chestnut color; spire somewhat

produced, pointed at the apex; sutures impressed; whorls 6, the last one very large and very much inflated; aperture broadly expanded; outer lip acute, and within the margin brown-banded; columella impressed in the middle and furnished with a large fold. Length 9, diameter 12 mm. Los Angeles river, California.

PHYSA VIRGATA Gould.

Shell moderate, solid, smooth, elongate-ovate, ash-colored with longitudinal olivaceous stripes; spire elevated, acute; whorls 4-5, well separated; aperture lunate, two-thirds the length of shell; columella moderately folded, with a heavy callus, within yellowish-red. Length 10, diameter 6 mm.

Living: Gila river, Arizona (T. H. Webb). Los Angeles and San Diego, California.

PISIDIUM OCCIDENTALE Newc.

Sierra Laguna, Baja California.
Cooper, Cal ac pr 2d ser, 3:217. Zoe 1:197.

PLANORBIS AMMON Gould.

Shell large, discoid, subconic, delicately striate; left side broadly and deeply concave, showing 4 obtusely carinated whorls; right side concave, showing 2½ rounded whorls; aperture ovate triangular, sometimes quite expanded on each side; axis, five-eighths to one; diameter ¼ to ½ inch.

Living: Klamath lake, Oregon. Honey lake, Lassen county, Calif. Nevada, Colorado river.

Quaternary: Glenega Grande, Colorado Desert.—T. H. Webb; W. P. Blake. Lahontan basin, Lassen county, California.

PLANORBIS ANITENSIS Cp.

"Shell (when held mouth downward) with the right side concavo-convex, the left flat (or slightly concave), the left margin forming a sharp carina expanded beyond the edge of shell, which is marked by a compressed line. Whorls 6, visible on both sides, uniformly flat on the left side, forming a concave umbilicus on the right, where their surface is rounded. Mouth triangular, the right lip arched, the left neatly fit, the extremities joined to outer angle and to obtuse margin of umbilical cavity. Umbilicus half as wide as the shell; flat side of mouth one-fourth of diameter; greatest breadth (at mouth) over one-fifth of same; greater diameter 0.26, least 0.03 inch."—Cooper, Cal ad pr 2d ser, 3: 341.

Type locality: Laguna at Santa Anita, Baja California, at an elevation of 100 feet, and 10 miles from San José del Cabo.

PLANORBIS BINNEYI Tryon.

Living: Oregon; Washington.

PLANORBIS HORNII Tryon.

Shell of three convex volutions; aperture almost orbicular, not oblique, nor extending above or below the plane of the whorls; labrum slightly reflected, thickened within, its ends converging so as nearly to connect on the parietal wall; lines of growth fine and close. Color light horn. Diameter 21, height 7 mm.

Living: Fort Simpson, British America (George H. Horn). Grant's lake, California (W. M. Gabb).

PLANORBIS OPERCULARIS Gould.

Shell dextral, much depressed, lenticular, with a prominent blunted keel at compressed line; tip sunken; beneath the periphery defined by a marginal, compressed line; tip sunken; beneath umbilicated for about one-third the breadth of the base, showing 3 volutions, convex, surface rather rude and indented, marked with irregular, coarse, much arcuated lines of growth, and here and there a few obscure, raised revolving lines; color dark chestnut brown, a little clouded; whorls above 4, slightly convex; suture well defined, impressed; aperture transversely subrhombic, lip above slightly declining, at periphery acuto-angled, beneath arched, lips embracing $\frac{1}{2}$ of that part of the whorl which is beneath the carina. Diameter 6, height 1.5 mm.

Living: Common in the waters of California. Vancouver Island.

PLANORBIS PARVUS Say.

Living: All British America and United States. Manitoba to New Mexico. Cantillas canyon, Baja California (Orcutt).

PLANORBIS PENINSULARIS Cp.

"Shell with both sides concave, the right with whorls rounded, their edge forming an obtuse margin, and the outer one partly enclosing the others so that it forms two-thirds the greater diameter of shell. Whorls 5, visible on both sides, the rounded (or right) surface showing less of them than the other. Left (or umbilical?) surface nearly flat, deeply concave near middle, the umbilicus being over one-third of diameter. Mouth trapezoidal, very oblique, its lips curved, the right extremity attached near the concave spire, the left to the obtuse periphery of shell. Mouth one-third longer than wide; its breadth over one-third that of shell. Greater diameter 0.18, least 0.05 inch. Color brown, surface smooth."—Cooper, Cal. ac pr 2d ser. 3: 342.

Type locality: "With *P. antensis*, in same laguna."

PLANORBIS SUBCRENATUS Cpr.

Shell tumid, very thin, horn-colored; whorls 6, rounded, sutures impressed; with sharp radiating, somewhat crowded and occasionally minutely crenulated ridges; aperture rounded, parietal wall small, scarcely touching the penultimate whorl; labrum slightly deflected, fuscous within; umbilicus deep. Diameter 23 height 9 mm.

Living: Oregon (Nuttall). British Columbia to Baja California.

PLANORBIS TUMENS Cpr.

Shell rapidly swelling, horn or reddish smoke-colored; whorls 4 or 5, with light waving striae; sutures deeply impressed; on one side subangulate or subcarinate near the suture, on the other rounded; umbilicus very deep; aperture with a sinuous edge, one side standing out above, flattened below, the other flattened above, produced below, capacious and rounded; labrum very thin. Diameter 15, height 6.5 mm.

Living: Mazatlan; Baja California; San Francisco, Petaluma, and southern California.

PLANORBIS TUMIDUS Pfeiffer.

Shell opaque, pale horn colored or smoky, densely and finely striated, umbilicated above, slightly concave below; whorls 5, convex, subcarinate on each side, rapidly increasing, separated by a deep suture; aperture oblique, lunate-rounded, somewhat kidney-shaped. Diameter 19, height 6 mm.

Living: Texas. Los Angeles, California. Nicaragua (T. Brydges). Guatemala.

PLANORBIS VERMICULARIS Gould.

Shell dome-shaped, minutely striated by growth, whorls 4, the last one deflected near the aperture, rounded at periphery, tip depressed, suture very deep, the whorls sloping towards it; base cup-shaped, exhibiting all the whorls. Aperture exhibiting a very oblique section of π cylinder; lip embracing about $\frac{1}{2}$ the height of the last whorl and joined by callus. Height 1.6, diameter 5 mm.

Living: Oregon; California; Baja California (Orcutt).

POMPHOLYX EFFUSA Lea.

Shell roundly gibbous, rather thin, effuse, reddish horn-colored or greenish, whorls 5, flattened above, concave below; aperture subrotund, dilated, white within. Length 6, diameter 3 mm.

Keep. West Coast shells, 116, f 103.

Living: Pitt river, Modoc county, to Lake Tahoe, California. Pyramid lake, White Pine, Nevada (Henry Hemphill).

POMPHOLYX SOLIDA Dall.

Living: Fish Springs, Owens river valley, California.

TRYONIA CLATHRATA Stimpson.

Shell elongated, narrow; apex of spire acute; sutures deeply impressed; whorls 3, with generally about 12 longitudinal ribs crossing them, sometimes crossed by revolving striae or ridges, and angulated in the middle; aperture rounded oval, very small; diameter, 1.5; altitude 5 mm.

Quaternary: Dry lake, Colorado Desert.

AMNICOLA LONGINQUA Gld.

Shell elongate ovate, horn colored, surface quite smooth; apex obtuse; whorls 5, well rounded; sutures deep, aperture elliptical, broadly rounded posteriorly; lip simple, copiously incrusting the pillar margin, which is profoundly arcuate; umbilical region nearly perforate. Length one-eighth, breadth one-tenth inch.

Living: Utah.—Henry Hemphill.

Quaternary: Clenega Grande, Colorado Desert.—W. P. Blake. Lahontan basin, Lassen county, Calif., Nevada.

VALVATA VIRENS Tryon.

Shell turbiniform, of 4 well-rounded whorls; spire elevated, apex acute, sutures deeply indented, periphery almost angulated; umbilicus very wide; aperture oval or nearly round, the peristome merely touching the body above. Surface closely striate. Color brilliant to dark green. Height 5, diameter 5 mm.

Living: Clear lake, California. Utah lake.

C. R. ORCUTT.

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Brief notices inserted free for subscribers.

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"The best and most influential mining paper in the world." Weekly edition, \$5 a year; monthly, \$1.50 a year. Specimen copy free.

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This popular paper is a practical wide-awake magazine of physical culture and hygiene. The editorials consider a number of timely topics. This magazine contains a great amount of miscellaneous matter pertaining to health culture, including Answers to Correspondents, book notices, etc., and certainly well worth the price, 10 cents a number, or \$1.00 a year. 503 Fifth Ave., New York.

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MINING: Spokane, Washington.

Journal of the northwest mining association. \$1 a yr. Monthly.

OHIO NATURALIST: Columbus, O.

Published by the biological club of the Ohio state university. 50c a year of 8 numbers.

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WITCH CREEK

9 rooms, 2 A. table grapes, 7 assorted fruits, 16x24 barn with stone basement, water, wood, near hotel, school, stage, store, etc.—all for less than cost of improvements, \$8000

ORCUTT, San Diego, California.

PAUMA.

The Pauma rancho, in San Diego county, California, is situated in the upper San Luis Rey valley, about 55 miles north and east of San Diego City, and may be reached by the Southern California railway to Escondido, thence by team, about 15 miles, on a good county road. One of the finest and best watered ranches in the state, containing 13,100 acres (title perfect—a Mexican grant, confirmed by the United States).

The Pauma creek, which flows into the San Luis Rey river, is a large and constant stream. An Indian village is located on the banks of this stream, whose waters they use for irrigating purposes. The creek and river run for several miles through the ranch, affording ample supply for irrigation, further supplemented by several large springs of crystal water.

The land is adapted to the growth of vines and fruit trees in the highest perfection; 5,000 acres are valley land, especially adapted to the culture of corn, alfalfa, grain and fruits; 3,000 acres are a mesa or table land, particularly suitable for oranges, olives, figs, and the raisin grape; the remainder excellent grazing and bee range, with an abundance of wood and water.

This picturesque section has for years been the property of the Catholic Bishop of Southern California. Planted to trees and vines, and properly cultivated, and stocked with cattle, horses, and bees, a princely income could be derived from this magnificent estate, or it could be converted into a thriving community, supporting many happy homes.

This beautiful ranch is now for sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California, who will be pleased to furnish our readers with further particulars, price and terms, on mention of this magazine.

SAN DIEGUITO.

The Rancho San Dieguito contains 8,132 acres, of which about 7,000 are capable of a high degree of cultivation. About 2,500 acres are of the finest bottom land, especially adapted for corn, beans, vegetables, and alfalfa; the mesa lands now have oranges, lemons, figs, guavas, olives, apricots, peaches, walnuts and grapes in bearing.

The San Dieguito river and San Elijo creek run through the property, affording ample supply of water for irrigation, supplemented by a good spring, and wells from 6 to 20 feet deep. Cottonwood and willows furnish an abundance of wood.

Three houses, 2 barns, blacksmith shop, and other buildings, tools, wagons, etc., for sale with the ranch, which is now leased for \$2,500.00 a year—optional with purchaser to take possession in 30 days. Price \$8.00 an acre.

For sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California.

RANCHO DE SAN YSIDRO.

Six square leagues (26,628 acres) of fertile land, with creeks of running water and perennial springs, an old adobe house, and primeval orchard of olives, oranges, lemons, figs and grapes, situated in Mexico, about 20 miles south and east of San Diego City, California, is an estate that might well captivate the fancy of any eastern home seeker.

One-third of the land is adapted to cultivation, the balance grazing land. Quartz and placer gold mines, mineral water, abundant wood, and a perfect climate, are among the attractions.

For sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California.

EDITORIAL.

It is our purpose to bring together in these pages descriptions of all the animals, plants, minerals, etc. of the west, together with notes of economic and geographic significance, bibliography, synonymy, etc.

The cooperation of our readers is invited and our services in turn we offer

in determining names of minerals, shells and plants, or in any way that may tend to increase interest in these branches.



Scientific Societies.



AMER. MUSEUM of NAT. HISTORY:
ARGENTINA REPUBLIC: Museo Nacional de Buenos Aires.
—Comunicaciones. Vol. 1, No. 8.
AUSTRALIAN MUSEUM:

Report of trustees for 1899.

CALIFORNIA ACADEMY of SCIENCES:
CANADIAN INSTITUTE:
CINCINATI SOC'Y of Natural History:
COLORADO College Scientific Society:
ESSEX INSTITUTE:
FIELD COLUMBIAN MUSEUM:
KANSAS ACADEMY of SCIENCES:
MASSACHUSETTS HORT. SOCIETY:
MISSOURI BOTANICAL GARDEN:

Twelfth report, 1901.

ROYAL GARDENS. Kew. England:
SOCIETE SCIENTIFIQUE de CHILI:
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TORREY BOTANICAL CLUB:

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- Journal of mycology
- Californian illustr. magazine v 3 Feb '94
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- Torrey bot club bulletin
- US Dept Agric bot b 1 3 9 10 11
- chem b 10 12 18 19 27 32 35-7
- entom b 1st ser
- Hopkins laboratory contr 4 & 16 and many others.

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- Scorpio allenii, scorpiion, 30".
- Trap-door spider 25c, nest (portion with lid) 25c.
- Crabs 5c to \$1—also other crustacea, barnacles ac
- Echinarachnius excentricus, flat sea-urchin or 'sand dollar,' with or without spines, 5 @ 20c
- Strongylocentrotus purp rascens 10 @ 50c.
- Egg of Leopard shark, Heterodontus francisi, odd, resembles a piece of twisted glue, 15c.
- Devil fish, Octopus punctatus, 50c
- Goose barnacles, very odd, 10c
- Feather moss, Aglaophenia struthionides, 25c.
- Pinus Torreyana cone, 35c

COPPER is KING

[Abstract of a report by a mining engineer on a group in our hands for sale]

One claim of 20.66 acres, patented.

Four contiguous claims, unpatented.

Total area: 88 acres, 4,533 square feet.

Located on the west side of the Penos Altos range, Penos Altos mining district, Grant county, New Mexico, 2 miles west of the town of Penos Altos, and 3 miles north of Silver City, the county seat and railroad station. Altitude, 7,500 feet. Altitude of Silver City, 6,000 feet.

Good roads from Silver City to the mines.

Permanent water on the mines for camp use; sufficient to run a large smelting plant can be developed at a small expense.

Porphyritic-syenite hanging and foot walls, with quartzite, porphyry, syenite, dolomite (lime), porphyllite, iron and quartz alternating between the several ore bodies. The ore bodies vary in width from 3 to 150 feet each, iron capped and in places quartz. The surface shows the copper ore in bunches in the strata varying from 1 to 10 feet wide. The character of the ore is copper-iron carbonates, showing a little native and oxides of copper, and copper sulphides below the water level, the latter carrying a large percentage of iron and zinc at the south end of the ground, where a tunnel is run. The zinc only shows at this end and will disappear at depth, as is evidenced nearby.

Ores free smelting, 3 to 60 per cent. copper, containing lime in a few places adjoining dolomite wall. Shipments of ore average 8 to 13 per cent. copper, iron and silica neutral.

Ore can be marketed at the Silver City reduction works.

Cost of mining, assaying and hauling to Silver City estimated at \$6 per ton on small shipments; smelting charges \$6 per ton. On large shipments, after development, the cost will be reduced 25 per cent.

Net profit per ton (on a 10 per cent. ore) estimated at \$13.

A 3 per cent. copper ore can be smelted on the ground and marketed in the east at a profit.

This great deposit has the same geological and mineralogical characteristics of the mines of Clifton, Arizona, and the Copper Queen mine, of Bisbee, Arizona. Copper in this formation does not play out, but gets richer and better defined as depth is attained, the ore existing in surface bunches and chambers, and ore shoots below the water level.

The trend of the ore bodies and formation is N. E. Surface dip of ore bodies is 30 to 40 degrees N. W. from the vertical towards the vertical hanging wall. Development shows the same to be both vertical and dip S. E. into the mountain at depth.

Very little gold and silver is found in these surface ores. Silver 6 to 7 oz.; gold 0 to \$3 per ton.

Surface workings, cuts, shafts and tunnels, from 5 to 100 feet each in length or depth, have been made by old-time gold hunters and the present owners in mining surface ores, which show the formation, ore bodies in place, and their permeability.

A 20-foot open cut, and 220 feet of tunnel, crosscutting 3 ore bodies on the south end of the copper, extending below water level, has been made; approximate depth attained, 125 feet.

Very little timbering will be required. Pine, oak and juniper wood for all purposes on the ground. Wood can be purchased for \$2 per cord.

This group of copper mines embraces the only fluxing copper ores in the district. The expenditure of \$1,000 in development will probably open up pay ore bodies of chalcopyrite in the extension of the tunnel.

Price, \$50,000; six months' developing bond; shipping privileges.

ORCUTT, San Diego, California.

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Telephone and telegraph.

Baths and electric bells.

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The West American Scientist.

Vol. XII. No. 3.

August, 1901.

Whole No. 104.

Established 1884.

THE WEST AMERICAN SCIENTIST.

Published monthly.

Price 10c a copy; \$1 a year; \$10 for life.
Charles Russell Orcutt, Editor,
Number 365 Twenty-first Street,
San Diego, California, U. S. A.



ALAMO MINES.

After an absence of ten years your correspondent is again visiting in the mining town of Alamo, Baja California, situated about forty miles south of the older town of the Real del Castillo, and some seventy miles from Ensenada. After arrival in Ensenada by stage from Tia Juana, making a quick trip in a day and a half from the line. I bought a horse and saddle and two pack burros, and started for the Alamo via La Grulla, the beautiful rancho of Christopher McA'eer—now looking sadly neglected, rented to Chinamen for a vegetable garden.

From La Grulla we soon left the wagon road for a trail through wild and beautiful hills, spending Sunday at a little valley called the Sycamores—where wild bees thrived amid a wealth of flowers, and where an apparently new species of *Ancylus*, a tiny water snail, rewarded diligent search among the stones in the clear running stream. The following Monday my guide led me over bushy hills innocent of all vestige of trails to the Santa Clara valley, where the wagon road to the Alamo was again met, and five leagues further on we found ourselves entering upon the one main street of the town—but little changed in outward appearance in the past decade.

But none of its former life seemed to remain in the deserted streets; none of the acquaintances of my former visit greeted my return; the semi-circle of smoke stacks, eight or ten in number, around the town to the south and west were silent from sunrise to sunset, the English, American, Italian, French, Chinese, Mexican and Indian races being about equally represented in the handful of inhabitants.

The history of the Alamo savors somewhat of romance. Tradition says that a red-handed fugitive from justice for some years kept the secret of these rugged peaks, but in a moment of fancied security fell into the hands of the mounted police, and for life and liberty exchanged his tale of gold. The rush from San Diego to the new placers will long remain in the memory of those who participated therein. Basillio Padilla was one of the characters of early days, a keen prospector, who thought nothing of taking out a pound of gold in a day—and spending it at night at the gaming table. His wife, however, was a better prospector than he, saith tradition here, and at her advice he left ground paying \$200 a day for ground that yielded \$2,000 for a day's labor—in the now abandoned but still famous Mexican gulch! It was this same Mexican who later found a quartz boulder studded with gold, which led to his discovery of the Princesa mine, said to have later yielded in a single pocket half a million of gold dollars.

This same Basillio Padillo had a partner, who, on the sale of the Princesa, pocketed all the money and left for parts unknown. In 1898 many a

San Diego housewife bought fish from a little old peddler with a sick wife who occupied one of my houses gratis. The steamer took the devoted old couple south to the orange groves of Durango, via Mazatlan, and news now comes of the old man having found and sold another mine for \$30,000 in gold.

But in my ten days' sojourn a change is creeping over the quiet village. The Aurora Consolidated Mining company has secured control of eighteen of the leading properties. It is credited with having \$260,000 in gold in its treasury, and with the announcement of its intention to sink 1,000 feet on the Aurora and Princesa mines, hope is reviving in the hearts of those who have staid by the town.

The Aurora, Ulysses, Montezuma, Telemico, Grand de Oro, Cocinera, Lawrence, Ensenada, India, Princesa, San David, San David No. 2, Penelope, Arbol de Oro, Borracho, Sterling, Spider and Chispa are the names of the mines of the new company, which it is believed will be developed into paying properties under the management of Mr. Mugford.

The Texas mine is in charge of Mr. Miller, but his company has been quiet for the past two years. Mr. Church, with characteristic persistence, is rebuilding a mill on his property single handed, and deserves a part in the bright future now predicted for the camp.

The writer has secured the agency of one of the best groups of mines in the camp, which in earlier days yielded \$8,000 to \$10,000 gold per month. The owner reached the camp "dead broke" and on sinking to the 100-foot level, found himself unable to continue single-handed, at a profit, and now invites capital to join him in developing the virgin ground beneath.

Edgar Davis, formerly of South Carolina, better known here as "Placer Davis," is doggedly persistent in seeking to win a stake from the sands of the creek, and expresses faith in the future of the camp, and in the merit of the "Scorpion," which has yielded many tons of \$500 ore in the past.

In passing, I may mention that F. R. Sawday, formerly of Julian, is now the manager of the Lower California

Development company's store at Ensenada, while his son, F. H. Sawday, has charge of the company's branch store in Alamo, and Americans will always find them accommodating and pleasant men to meet. Many things seem high here—bacon \$1 a kilo, flour \$6 a sack, hay \$100 a ton, and other things in proportion, but when one remembers that a United States dollar pays for \$2 here, prices do not seem quite so high.

A little stir in the stillness of the place was recently made over the discovery of some new placers five or six miles from here, where several men made very respectable wages for a time with dry washers. Last week, however, one of the heaviest summer storms known in the history of the place, destroyed for a time the infant industry of dry washing for gold. As a guest of J. W. Lee, the leading spirit in this work, I witnessed the operation before the storm, and saw a clean-up of an ounce and a half of virgin gold. Now that his operations are interrupted, Mr. Lee proposed an overland trip with his wife to San Diego, horseback, expecting to ret runagain as soon as the ground becomes sufficiently dry to permit work.

Rev. R. B. Taylor, pastor of the First Presbyterian church of San Diego, is planning to spend his vacation this month on the celebrated Sierra San Pedro de Martias—the highest mountain in the peninsula, rising to the south nearly 11,000 feet above sea level. Antelope, deer and mountain sheep are reported abundant, with wild honey, buried treasures of pearls, gold nuggets, and ancient silver dollars, and lost mines of fabulous richness, among its varied attractions.

A man has recently been reported as killed there by a mountain lion, but such accidents are exceedingly rare. The miles of pine trees, the running water, abundant grass, and the trout stream at its base, renders it the ideal spot for the hunter—one of the few places of its kind that has so far retained all its primeval beauty.

John Gray of Campo has a cattle ranch between here and the big mountain, in the Valle Trinidad, and it was an unexpected pleasure to shake his

hand the other day, when he visited town. My room is decorated with deer and wildcat skins and French flags, having been kindly placed at my service by Mrs. Joseph Goyette, a French Canadian, whose former home was not far north of my own native state, Vermont. The big room has been the scene of many a dance and ball to the governor during the prosperous days of the camp, and near it many a gold nugget has been picked up in the past. After the recent rains, I found two small nuggets myself in the street, near, and a Mexican boy picked up one worth about a dollar. In earlier days, Jack Lee found one weighing an ounce and a half, and the colored barber next door says he has picked up over \$300 worth in a radius of a few hundred feet. The government does not allow digging in the townsite, which chances to have been rich placer ground.

Most of the mines here are considered stringers from a big fissure vein which it is believed will be developed at a depth of 500 to 1,000 feet. The walls are granite, the veins interrupted by syenitic dykes. The best ore consists of magnetite in quartz with free gold. Garnets, epidote, schorl, mica, lead and copper ores, and cinabar, are among the minerals so far observed. My servant brought me one fine quartz crystal, clear as glass, and three inches in its greater diameter.

Tomorrow I expect again to follow the gentle burro to the mountains—ever in search of the fabulously rich lost mine of the mission fathers—and the beetles, snail and flowers that may lie in my path.

C. R. ORCUTT.

Zwei neue kalifornische Pflanzen.

ALIGERA PATELLIFORMIS sp. nov.

Diese Art gehört zu der Gruppe mit zweilippiger, kurzgespornter Blumenkrone. Pflanze oft 4-5 dm hoch. Krone hell rosenrot mit 2 Punkten auf der Unterlippe. Frucht 3-3.5 mm lang und nicht ganz so breit, auf der Rückenfläche dicht bedeckt mit sehr kurzen Haaren, an der Brustfläche mit einer Haarzeile

längs der Naht; Flügel etwa so breit wie der Same, ihre Ränder nur wenig einwärtsgebogen, die Schüssel daher sehr flach; Schnabel sehr kurz nicht über den Flügeln hervorragend.—Auf feuchten oder nassen Plätzen, Stonewall Mine, Cuyamaca-Gebirg, Meereshöhe 4600 F., Juni 1897 (S.B. Parish, Nr. 4539).—Herr Parish hatte die Freundlichkeit mir vor einigen Jahren eine Pflanze zuzesenden, dieselbe hatte jedoch keine Blüten und nur noch wenige Früchte, aber es gelang mir, aus den Samen junge Pflanzen zu ziehen.

COLLINSIA BREVIFLORA sp. nov.

Aufrecht, 2-3 dm hoch, meistens oben verzweigt. Behaarung unten am Stengel sehr kurz, oben länger und drüsig wie am Kelch und Blütenstiel. Blätter fast oder ganz kahl, 2-3 cm lang, lanzettlich bis fast linealisch, stumpf, am Grunde verschmälert, ganzrandig oder etwas gezähnt; oder die untersten kurzhaarig, langrund und gestielt, der Rand sägezähmig mit grossen, stumpfen Zähnen. Blüten etwa 7 mm lang, oft 6 in einem Quirl. Kelch etwa 5 mm lang; seine Lappen etwas mehr als halb so lang, linealisch oder etwas breiter, stumpf oder einige beinahe spitz. Krone unten weisslich mit einigen Längsstreifen, nur unbedeutend gekrümmt und der Schlund nicht stark erweitert; die Lappen hell rotblau, die seitlichen der Unterlippe etwas länger als die übrigen, die 4 ausgebreiteten ungefähr gleichgestaltet, über ihrem Grunde nicht erweitert, am Ende etwas abgestutzt und eingekerbt; Oberlippe unterhalb des Spaltens etwas punktirt. Staubfäden kahl, der verkümmerte fast 5 mm lang und etwas keulenförmig. Fruchtsiel etwa so lang wie der Kelch, mitunter auch 2- oder 3-mal so lang. Kapsel fast kugelig, viel kürzer als der Kelch, 2 samig. Same 2.5 mm lang, länglich und, dick, mit rauher

Oberfläche. Ockenden, Fresno County, Meereshöhe 5300 F., 1900 (H. M. Hall & H. P. Chandler, Nr. 86).

WILHELM SUKSDORF.

PERIODICALS.

AMERICAN BOTANIST:
Binghamton, N. Y.

AMERICAN ECONOMIST:
No. 135 W. 23d st., New York, N. Y.

AMERICAN FLORIST:

AMERICAN GARDENING:
No. 136 Liberty street, New York, N. Y.

AMERICAN GEOLOGIST:
Minneapolis, Minn.

AMERICAN HOMES: Knoxville, Tenn.

AMERICAN NATURALIST:

AMERICAN Mo. REV. of REVIEWS:

AMERICAN ORNITHOLOGY:
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CANADIAN ENTOMOLOGIST:
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"The best and most influential mining paper in the world." Weekly edition, \$5 a year; monthly, \$1.50 a year. Specimen copy free.

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This popular paper is a practical wide-awake magazine of physical culture and hygiene. The editorials consider a number of timely topics. This magazine contains a great amount of miscellaneous matter pertaining to health cul-

ture, including Answers to Correspondents, book notices, etc., and certainly well worth the price, 10 cents a number, or \$1.00 a year.

LADIES' HOME JOURNAL:
Philadelphia, Pennsylvania.

Far surpasses its rivals, and become the highest type of artistic printing, with high literary merit.

MEEHAN'S MONTHLY:

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Arthur Chamberlain, Editor.

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MONITOR: Hamburg, Ill.

MUHLENBERGIA:

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NATURE STUDY: Manchester, N. H.

NAUTILUS:

Cor. 19th and Race sts., Philadelphia, Pa.

Devoted to the interests of conchologists. Monthly, \$1 a year.

OHIO NATURALIST: Columbus, O.

Published by the biological club of the Ohio state university. 50c a year of 8 numbers.

OOLOGIST: Albion, N. Y.

PACIFIC ENSIGN:

PHILATELIC West and Camera News:
Superior, Nebraska

PITTONIA:

POPULAR SCIENCE NEWS:

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SCIENCE:

SCIENTIFIC AMERICAN:

SUCCESS WITH FLOWERS:

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No. 132 N. 12th st., Terre Haute, Ind.

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REAL ESTATE.

PAUMA.

The Pauma rancho, in San Diego county, California, is situated in the upper San Luis Rey valley, about 55 miles north and east of San Diego City, and may be reached by the Southern California railway to Escondido, thence by team, about 15 miles, on a good county road. One of the finest and best watered ranches in the state, containing 13,100 acres (title perfect—a Mexican grant, confirmed by the United States).

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For sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California.

RANCHO DE SAN YSIDRO.

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The editor reported to the State mining bureau in 1890 (10th report, 905), on the Colorado Desert:— 'The formation in certain sections seems very promising [for the producing of petroleum].

About half a million acres have been taken up for oil in the past few months. The editor is in a company claiming over 20,000 acres. Yes, stock will soon be for sale. Land also.

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A free milling gold "prospect" has been placed in our hands for sale, said to have an 85-foot shaft, and other workings, with a 5-foot ledge of ore assaying \$12.50 per ton. Good roads, wood and water. Price, \$20,000. An examination and conservative report will be made on reasonable terms. Address the editor.

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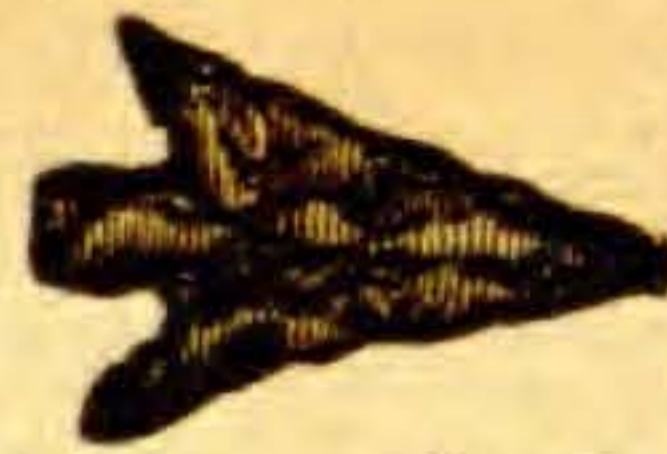
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We would be pleased to submit propositions to investors, or to list good improved or undeveloped properties.



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DR. TAFT BROS. MEDICINE CO.

AVON SPRINGS, N. Y., Feb. 1, 1901.

Gentlemen: I write this testimonial from a sense of duty, having tested the wonderful effect of your Asthamalene, for the cure of Asthma. My wife has been afflicted with spasmodic asthma for the past 12 years. Having exhausted my own skill as well as many others, I chanced to see your sign upon your windows on 130th street New York, I at once obtained a bottle of Asthamalene. My wife commenced taking it about the first of November. I very soon noticed a radical improvement. After using one bottle her Asthma had disappeared and she is entirely free from all symptoms. I feel that I can consistently recommend the medicine to all who are afflicted with this distressing disease.

Yours respectfully, **O. D. PHELPS, M. D.**

DR. TAFT BROS. MEDICINE CO.

67 E. 129th st., N. Y., Feb. 5, 1901.

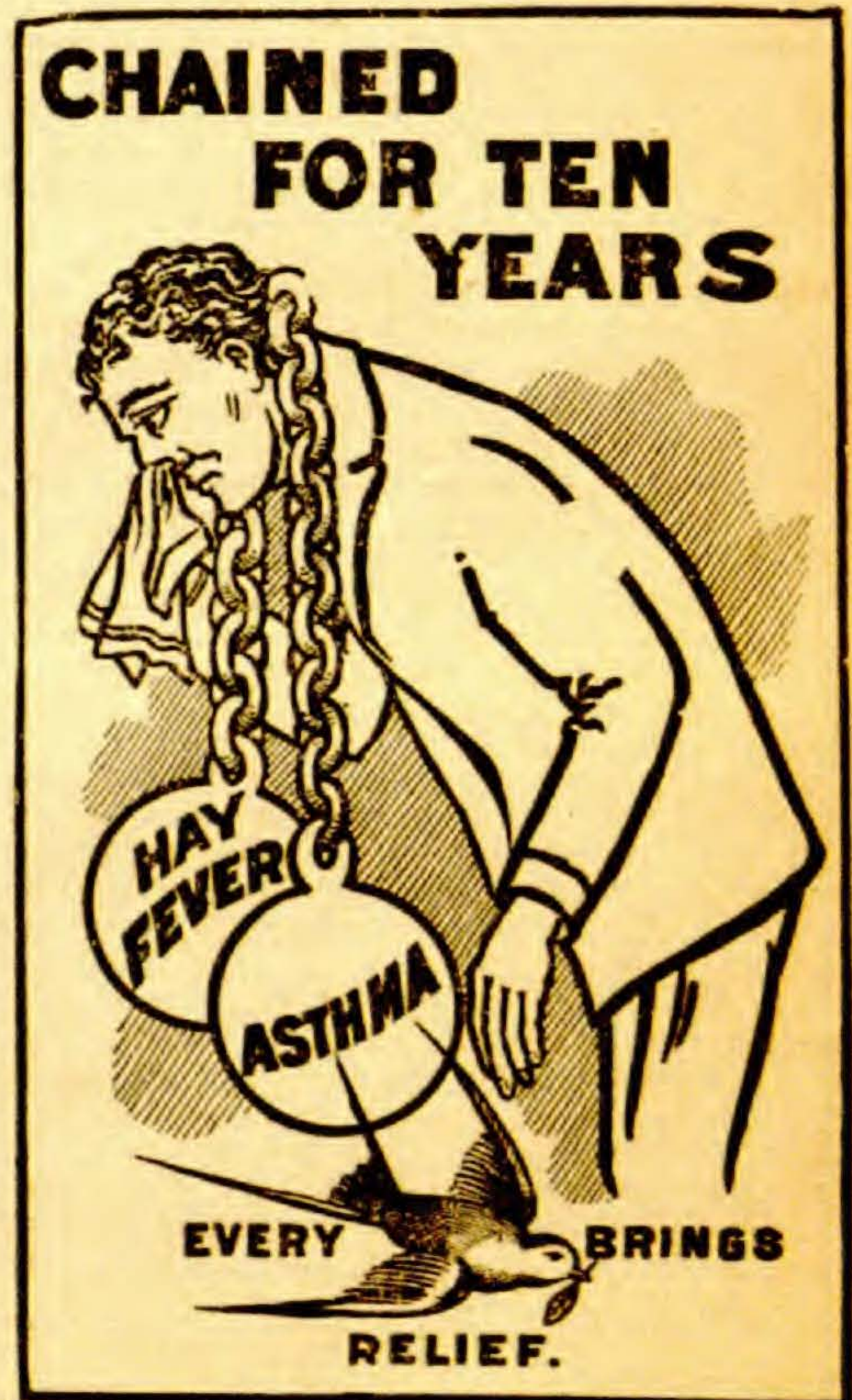
Gentlemen: I was troubled with Asthma for 22 years. I have tried numerous remedies, but they have all failed. I ran across your advertisement and started with a trial bottle. I found relief at once. I have since purchased your full-size bottle, and I am ever grateful. I have a family of 4 children, and for 6 years was unable to work. I am now in the best of health and am doing business every day. This testimony you can make such use of as you see fit.

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Do not delay, write at once **DR. TAFT BROS. MEDICINE CO., 79 E. 130th st. N. Y.**



COPPER is KING

[Abstract of a report by a mining engineer on a group in our hands for sale]

One claim of 20.66 acres, patented.

Four contiguous claims, unpatented.

Total area: 88 acres, 4,533 square feet.

Located on the west side of the Penos Altos range, Penos Altos mining district, Grant county, New Mexico, 2 miles west of the town of Penos Altos, and 8 miles north of Silver City, the county seat and railroad station. Altitude, 7,500 feet. Altitude of Silver City, 6,000 feet.

Good roads from Silver City to the mines.

Permanent water on the mines for camp use; sufficient to run a large smelting plant can be developed at a small expense.

Porphyritic-syenite hanging and foot walls, with quartzite, porphyry, syenite, dolomite (lime), porphyrite, iron and quartz alternating between the several ore bodies. The ore bodies vary in width from 3 to 150 feet each, iron capped and in places quartz. The surface shows the copper ore in bunches in the strata varying from 1 to 10 feet wide. The character of the ore is copper-iron carbonates, showing a little native and oxides of copper, and copper sulphides below the water level, the latter carrying a large percentage of iron and zinc at the south end of the ground, where a tunnel is run. The zinc only shows at this end and will disappear at depth, as is evidenced nearby.

Ores free smelting, 3 to 60 per cent. copper, containing lime in a few places adjoining dolomite wall. Shipments of ore average 8 to 13 per cent. copper, iron and silica neutral.

Ore can be marketed at the Silver City reduction works.

Cost of mining, assaying and hauling to Silver City estimated at \$6 per ton on small shipments; smelting charges \$6 per ton. On large shipments, after development, the cost will be reduced 25 per cent.

Net profit per ton (on a 10 per cent. ore) estimated at \$13.

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Very little gold and silver is found in these surface ores. Silver 6 to 7 oz.; gold 0 to \$3 per ton.

Surface workings, cuts, shafts and tunnels, from 5 to 100 feet each in length or depth, have been made by old-time gold hunters and the present owners in mining surface ores, which show the formation, ore bodies in place, and their permanency.

A 20-foot open cut, and 220 feet of tunnel, crosscutting 3 ore bodies on the south end of the copper, extending below water level, has been made; approximate depth attained, 125 feet.

Very little timbering will be required. Pine, oak and juniper wood for all purposes on the ground. Wood can be purchased for \$2 per cord.

This group of copper mines embraces the only fluxing copper ores in the district. The expenditure of \$1,000 in development will probably open up pay ore bodies of chalcopyrite in the extension of the tunnel.

Price, \$50,000; six months' developing bond; shipping privileges.

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The West American Scientist.

Vol. XII. No. 4.

September, 1901.

Whole No. 105. ✓

Established 1884.

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ogists as a writer on the birds of New Mexico, ascended a lofty pine tree to procure a birds' nest, 29 Je 1901, became entangled in the rope and strangled in the presence of his bride.

DEAN, GEORGE W.:

Born in Ohio 20 Ag. 1820, died 10 Ap 1901. A successful nurseryman and florist, well known to many as an ardent collector of shells.

GOODE, GEORGE BROWN:

Part 2 of the report of the U. S. National Museum for 1897 is a memorial of this eminent naturalist, together with a selection of his papers on museums and on the history of science in America. Portraits of the earlier scientific men, and notice of their work in connection with "the origin of the national scientific and educational institutions of the United States," and "the beginnings of natural history in America," form a volume of great interest, and a worthy monument to one who was great as a man and as a scientist. A list of his published writings occupy 20 pages of the memorial.

Le CONTE, JOSEPH:

One of the most eminent scientists, of the University of California, died July 6, 1901.

He was of Huguenot descent, and was born in Liberty county, Georgia, 26 F 1823. As a teacher he was suggestive, interesting and inspiring, and his naturally kind and genial disposition gained him the affection of his pupils. Geology, optics, aerostatics and physiology were branches upon which he became authority.

Among his important writings are:

—Religion and science.

—Elements of geology.

—Evolution and its relation to religious thought.

—Sight, or the principles of monocular and binocular vision.

—Outlines of the comparative physiology and morphology of men and animals.

LINTNER, JOSEPH ALBERT:

Bulletin Vol. 5, No. 24 of the N. Y. State Museum, is a "memorial of life and entomologic work" of this prominent entomologist, by Ephraim Porter Felt, with portrait.

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BIOGRAPHICAL.

BIRTWELL, FRANCIS J.:

Well and favorably known to ornithol-

WEST AMERICAN MOLLUSCA.

STEARNS, ROBT. EDWARDS CARTER

--Exotic mollusca in California. Science, 27 Apr 1900.

Notes the occurrence of the following species:

AMALIA HEWSTONI Cooper.
Seattle, Washington, to San Diego, California.

BULIMUS VENTROSUS Fer.
Oakland, California (Henry Hemphill).

COCHLICOPA IULRICA Muell.
Ferrussacia subcylindrica L.
Crazy Peak, Berkeley, Cal. (H. Hemphill); Oregon; Alaska.

CREPIDULA CONVEXA Say.
Variety GLANCA Say.
This form of the Atlantic slipper-shell was found on the Alameda Mats, Cal. by Henry Hemphill.

HELICODISCUS LINEATUS Say.
Oakland, California (Henry Hemphill).

HELIX ASPERSA Muell.

MODIOLA PLICATULA Lam.
Nova Scotia to Georgia. Found in 1894 three miles north of Stanford University, Cal., by N. F. Drake.

MYA ARENARIA Linn.
Mya Hemphilli Newcomb.
San Francisco bay, Cal. (Henry Hemphill, N 1874). Washington. Accidentally introduced on the Pacific coast, from the Atlantic seaboard, and variously known as the "soft-shelled," "squirt," "long-necked" clam, and "mananose." An important food species.

OSTREA VIRGINICA Gmelin.
Importations of seed oysters from the Atlantic side to San Francisco bay, California, for the nine years ending with 1895 amounted to 15,271,000 pounds, costing \$350,000.00, according to the U. S. Fish Comm. report for 1896.

UROSALPINX CINEREUS Say.
The oyster-drill of the Atlantic coast, discovered on the oyster beds in San Francisco bay, California, by C. H. Townsend, in 1889.

ZONITES CELLARIA Muell.

ZONITES DRAPARNALDI Beck.
Greenhouses, Seattle, Washington; Oakland, California.

STEARNS, R. E. C.
--The edible clams of the Pacific coast and a proposed method of transplanting them to the Atlantic coast. U. S. Fish Com b 3:353-362.

Mentions the following:

CARDIUM CORBIS Mart.
Cockle.

CLYCIKERIS GENEROSA Gould.
Puget Sound to San Diego, California. "Geoduck," attaining a weight of 16 pounds (fide Capt. J. S. Lawson)!

MYTILUS EDULIS Linn.

SAXIDOMUS NUTTALLII Conr.
Saxidomus aratus Gould.

Saxidomus squalidus Desh.

Saxidomus brevisiphoratus Cpr.

Alaska to San Diego, California. Fully equal, if not superior, as many persons think, to the Atlantic quahaug.

SCRIZOPBAERUS NUTTALLII Conr.
Treatus maximus Midd.

Luteresca capax Gould.

Puget Sound to San Diego, California. Closely approaching the best oysters in tenderness and delicacy.

TAPES STAMINEA Conr.

"Little round clam," or "hard shelled."

ACTAEON TRASKII Stearns.

Shell small, conical above, cylindrical, rather solid, opaque, somewhat glossy; sculpture consisting of fine spiral impressed lines or grooves, which become wider toward the base of the body whorl, making the sculpture of the lower portion of the shell lirate; part of the lirae are slightly grooved and in some cases show a tendency to run in pairs; the grooved lines are not quite regular in their relative distances, and some are deeper than others; the surface is otherwise sculptured by sharp, close-set, incremental lines; these latter are subordinate to the spiral sculpture and are more conspicuous on the lower part of the body whorl. Color dull-cream white, with (in the example before me) 2 obscure, broad, pale rufous bands on the body whorl. Spire short, obtusely conical. Whorls 6 (probably, apex in example somewhat eroded); suture distinct, narrowly channeled. Aperture about two-thirds the length of the shell (not quite 9 mm), acutely angular above, rounded and effuse below, finely lirate and glossy within, with a thin glazing on the body whorl. Outer lip thin, simple. Columella short and flexuous, with a conspicuous fold, curving around the same and thickening the edge of the lip, which is moderately produced in the umbilical region. Length of shell (type), 24, of body whorl 19, breadth 12 mm."--Stearns, U S Na Mu pr 21: 297-298, f (1899).

Quaternary marl: San Diego, California (Stearns, Homer Hamlin).

ACTAEON PUNCTOCAELATUS, Cpr.
Stearns, U S Na Mu pr 21: 297, 299 (1899):--quaternary, San Diego, Calif.

Va. CORONADOENSIS Stearns.

Stearns, U S Na Mu pr 21: 299 (1899).
Slender, more attenuated and delicate than the recent specimens, without the dark bands. Quaternary marl, Spanish Bight, San Diego, California (Stearns).

SUCCINEA CINGULATA Forbes.

Oblong-ovate, slightly oblique, striate, shining; spine well developed, suture impressed; whorls 4; aperture large, oval, columella at the base receding to the left. Brownish-yellow, with obsolete spiral white lines. Length 12, diameter 6 mm. Mazatlan, Mexico?

Tryon, Monog T M 28, t 2 f 35.

SUCCINEA CHRYSIS Westol.

Living: Andreafski, Yukon river, Alaska.

PERIODICALS.

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- AMERICAN ECONOMIST:**
No. 125 W. 23d st., New York, N. Y.
- AMERICAN FLORIST:**
AMERICAN GARDENING:
No. 136 Liberty street, New York, N. Y.
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- AMERICAN HOMES:** Knoxville, Tenn.
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MONITOR: Hamburg, Ill.

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No. 547 W. Walnut st., Lancaster, Pa.
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lished by A. A. Heller. \$1 a volume.

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NAUTILUS:

Cor. 19th and Race sts., Philadelphia,
Pa.

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gists. Monthly, \$1 a year.

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OOLOGIST: Albion, N. Y.

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MINES.

CLEVELAND COPPER GROUP.

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UTTER, GEORGE H.:

Silver City, New Mexico.

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OIL

The editor reported to the State mining bureau in 1890 (10th report, 905), on the Colorado Desert:—"The formation in certain sections seems very promising [for the producing of petroleum]."

About half a million acres have been taken up for oil in the past few months. The editor is in a company claiming over 20,000 acres. Yes, stock will soon be for sale. Land also.

ORCUTT, San Diego, California.

MOHAVE DESERT IRON MINES.

In May, 1882, the writer first visited the region known as the Mohave desert, in San Bernardino county, California, and found it to be in fact a delightful garden, filled with a great variety of brilliantly colored flowers. The usually leafless and thorny shrubs were a mass of deep indigo flowers, while each open space displayed a bed of delicate annuals unknown to more favored localities.

The mountains on either hand of the Cajon Pass were still covered partially with snow, darkened with the masses of evergreen—spruce, cedar and pine, which render these peaks a delight in summer to the pleasure seeker.

The tree yucca, the wild datile, and large quantities of juniper, growing over a large part of these slopes, render the name desert somewhat of a misnomer; as one leaves the base of the mountains, however, large areas of very uninteresting country—from a horticultural standpoint—are met with, but the wealth of its minerals will be found a redeeming character.

About 16 miles due south from a point midway between Newberry and Hazlett stations, 275 miles from San Diego, Cal., and 180 miles from Los Angeles, Cal., by the Santa Fe route, occurs probably the largest deposit of iron ores on the Pacific Coast. It is variously estimated by conservative men that fifty to one hundred million tons of magnetic and hematite ores lie above and convenient to a suitable railway grade, which can be quarried rather than mined—if we restrict the word mining to the English sense of underground workings.

The writer is indebted to Mr. H. C. Gordon, of San Diego, Cal., one of the owners in this vast property, for many of the facts here presented concerning the Bessemer Iron District, the 320 acres of patented lands covering the more valuable and accessible portions of this remarkable body of ores.

The chief chemist of the U. S. Geological Survey, after an examination of the magnetite, says: "A very high grade of magnetic ore with but a trace of titanium."

Prof. Pierce de P. Ricketts, the well

known ex-chief of the school of mines and metallurgy, of Columbia College, New York, secured the following results from an examination made for the following elements only: Metallic iron, 68.48; Manganese, .038; Sulphur, .076; Titanium, .02; Phosphorus, (trace) per centum.

Prof. Woulfe, chemist of the Union Iron Works, San Francisco, Cal., secured the following results from a car load each of the Magnetite (M) and Hematite (H): Sesqui oxide of iron, M 68.8, H 81.94; Proto oxide of iron, M 25.5, H 8.28; Alumina, M 2.843, H 3.24; Manganese oxide, M .52, H .43; Lime, M .72, H .82; Magnesia, M 3.83, H 3.18; Phosphorus anhydride, M .013, H .066; Sulphur, M .038, H .47; Silica, M .845, H .061 per centum.

Samples of surface ores from all the workings, aggregating 50 lbs., gave: Iron, 66.25; Silica, 1.65; Lime, 1.35; Magnesia, 3.32; Sulphur, .031; Phosphoric acid, .554; Tannic acid, 0; Alumina, .84; Manganese, .25; Iron peroxide, 72.21; Iron proto oxide, 20.16; Manganese oxide, .39; and Phosphorus, .024 per cent. (analysis by Mr. Curry, of Pittsburg, Pa).

There is an abundance of good water at the junction of a proposed railway to the mines with the Santa Fe, and a good supply can probably be developed on or near the property. A uniform grade of one (not to exceed three) per cent., with no cuts, fills or expensive bridging makes a connection with the existing railroads comparatively easy of accomplishment. The cost of mining the ore is estimated not to exceed 50 cents per ton f. o. b., and freight to tide water, \$2 per ton. Fuel and timber can be obtained in large quantities from the mountains in sight, estimated to be about 8 miles away.

The 9th and 11th reports of the California state mineralogist give very able and conservative estimates of the quantity and quality of the ore bodies.

The recent discovery of oil at Victor, on the Mohave desert, should hasten the development of our latent iron industries, which have lain dormant for an abnormal period, owing in part to the death of one of the owners in these iron lands.

C. R. ORCUTT.

Just a thought to give thee pleasure,
 Just a hope to gild the way,
 Just a word to speak of Jesus,
 Do you love Him as you may?

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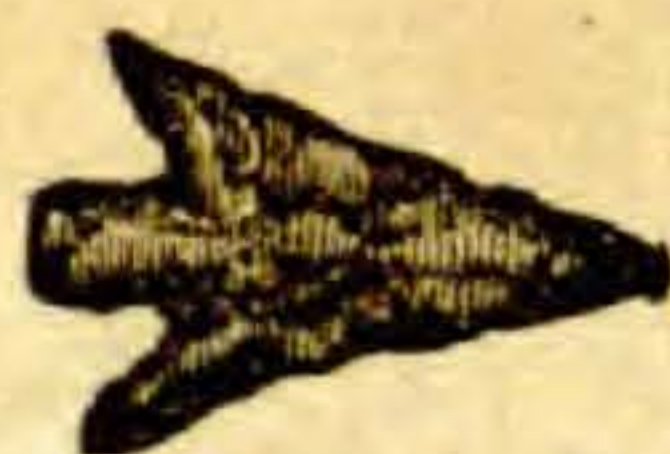
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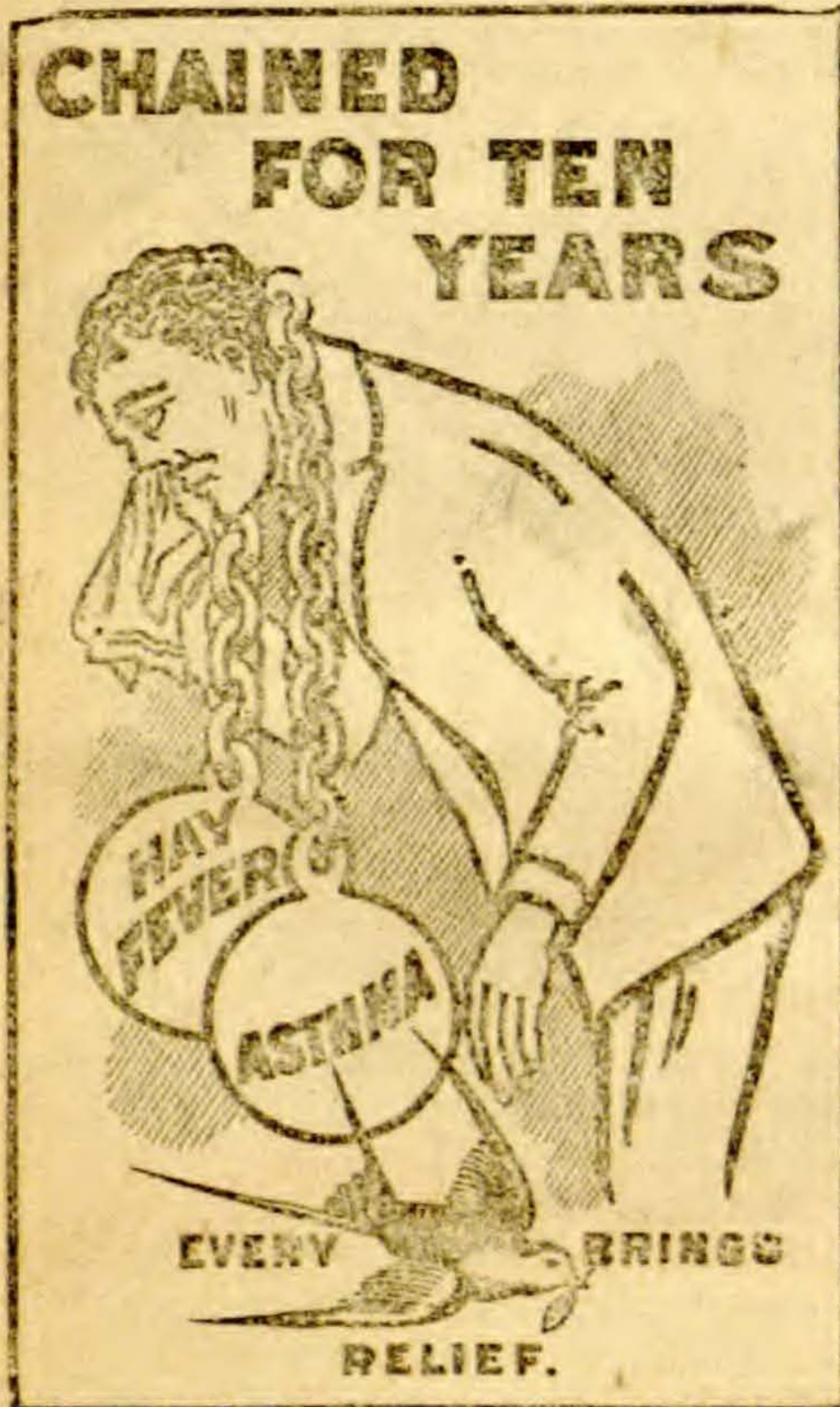
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New York, January 3 1901.

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Yours respectfully, **O. D. PHELPS, M. D.**

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Gentlemen: I was troubled with Asthma for 22 years. I have tried numerous remedies, but they have all failed. I ran across your advertisement and started with a trial bottle. I found relief at once. I have since purchased your full-size bottle, and I am ever grateful. I have a family of 4 children, and for 6 years was unable to work. I am now in the best of health and am doing business every day. This testimony you can make such use of as you see fit.

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REAL ESTATE.

PAUMA.

The Pauma rancho, in San Diego county, California, is situated in the upper San Luis Rey valley, about 55 miles north and east of San Diego City, and may be reached by the Southern California railway to Escondido, thence by team, about 15 miles, on a good county road. One of the finest and best watered ranches in the state, containing 13,100 acres (title perfect—a Mexican grant, confirmed by the United States).

The Pauma creek, which flows into the San Luis Rey river, is a large and constant stream. An Indian village is located on the banks of this stream, whose waters they use for irrigating purposes. The creek and river run for several miles through the ranch, affording ample supply for irrigation, further supplemented by several large springs of crystal water.

The land is adapted to the growth of vines and fruit trees in the highest perfection; 5,000 acres are valley land, especially adapted to the culture of corn, alfalfa, grain and fruits; 3,000 acres are a mesa or table land, particularly suitable for oranges, olives, figs, and the raisin grape; the remainder excellent grazing and bee range, with an abundance of wood and water.

This picturesque section has for years been the property of the Catholic Bishop of Southern California. Planted to trees and vines, and properly cultivated, and stocked with cattle, horses, and bees, a princely income could be derived from this magnificent estate, or it could be converted into a thriving community, supporting many happy homes.

This beautiful ranch is now for sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California, who will be pleased to furnish our readers with further particulars, price and terms, on mention of this magazine.

SAN DIEGUITO.

The Rancho San Dieguito contains 8,132 acres, of which about 7,000 are capable of a high degree of cultivation. About 2,500 acres are of the finest bot-

tom land, especially adapted for corn, beans, vegetables, and alfalfa; the mesa lands now have oranges, lemons, figs, guavas, olives, apricots, peaches, walnuts and grapes in bearing.

The San Dieguito river and San Elijo creek run through the property, affording ample supply of water for irrigation, supplemented by a good spring, and wells from 6 to 20 feet deep. Cottonwood and willows furnish an abundance of wood.

Three houses, 2 barns, blacksmith shop, and other buildings, tools, wagons, etc., for sale with the ranch, which is now leased for \$2,500.00 a year—optional with purchaser to take possession in 30 days. Price \$8.00 an acre.

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The West American Scientist.

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 Charles Russell Orcutt, Editor,
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 San Diego, California, U. S. A.

EDITORIAL.

We believe that Truth is stronger than falsehood, that Fact is more valuable than fiction, and hope to win the public recognition of this apparent reality.

The periodicals devoted to light literature far exceed in number those devoted to science, and the works of a novelist are read by hundreds of thousands, the papers of a naturalist by a few hundreds.

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The student of our wild flowers, of our beautiful trees, the friends in feathers and fur, the brilliant butterflies, the fishes, the insects, the shells and corals, cannot fail to gain inspiration of a higher life—that leads to a fuller appreciation of duty, and an increase in the world's treasures of knowledge and material advancement.

Our direct aim is a review of our present knowledge, and a record of new discoveries, in natural history and other branches of science. Descriptions of animals and plants, not easily accessible to the young student, notes of economic or geographic significance, bibliography, synonymy, and an interchange

of ideas, will be means used to a common end.

The reader must assist the editor in carrying out the great work undertaken. If the greatest results are to be achieved. The management of the journal exists to serve the reader—in identifying minerals, plants and animals, in supplying needed literature, as a medium of communication and record, or in any way that may tend to promote human intelligence, which in its greatest development leads to an affinity with God.

ABBREVIATIONS.

aes—Agricultural experiment station
 agr—agrostology (Division of)
 Am—America, American.
 an—annual.
 anth—anthropology, anthropological.
 b—bulletin.
 cir—circular.
 D-A—U. S. Department of Agriculture.
 f—Figure.
 FCM—Field Columbian Museum.
 pr—proceedings.
 r—report.
 sc—society.
 sr—Series.
 U—university.
 Zo—Zoology, zoological.

AUTHORS' LIST.

This is intended (1) as a catalog, by authors, of publications received, (2) as a catalog of our library, and (3) as a catalog of works treating upon the subjects embraced by our magazine, in fact, a complete bibliographical catalog, as far as we may be able to bring it up to date.

ANDERSON, LEROY:
 —See M. E. Jaffa.
 BEANS, HAL H.:
 —Some Idaho soils. U of Idaho aes b 28.
 DORSEY, GEORGE A.:
 —Archaeological investigations on the

Island of La Plata, Ecuador. FCM anth
er 2: 247-260, t 43-102.

—et H. R. Voth: The Oraibi Soyal ceremony. FCM anth sr 3: 1-59, t 1-37.

EATON, ELON HOWARD:

—Birds of Western New York. Rochester ac pr 4: 1-64. F 1901.

ELLIOT, D. G.:

—A list of the land and sea mammals of North America north of Mexico. Supplement of the synopsis. FCM so sr 2: 47-52, t 50-58.

—A list of mammals obtained by Thaddeus Surber, in North and South Carolina, Georgia and Florida. FCM so sr 2: 37-7, t 5-10.

—The Caribou of the Kenai peninsula, Alaska. FCM so sr 3: 59-62, t 11-13.

JAFFA, M. E.:

—et Leroy Anderson: Feeding of farm animals. Cal. aes b 132.

HALSTED, BYRON D.:

—Bean diseases and their remedies. N J aes b 151.

HARPER, GEORGE W.: How to determine and classify our common rocks. 1: pp. 10c.

HELLER, A. ARTHUR:

—Catalogue of North American plants north of Mexico, exclusive of the lower cryptogams. 160 p. 10 Mr 1896. 60c.

Ed 2. 10 N 1900. 252 p. Paper \$1.18; cloth \$1.45, postpaid.

HIRSCHT, KARL:

—Kakteenkulturen im Hause und ihr Wert. 1896. 52 p. 1 f. 50c.

LABOURET, J.:

—Monographie de la famille des Cactees. Paris. 684 p. 1853.

MORRIS, E. L.

Western High School, Washington, D. C.

—North American plantaginaceae.—H. Torr bot. cl. b. 23:112-122, t. 12 (F. 1901).

MURRAY, D. A.: Atoms and energies. 1901. 202 pp. \$1.25 cl. Introduction by Prof. Frederick Starr.

An interesting discussion in physical science, aiming at simple explanations of phenomena little understood, rendering them less mysterious to the average student; "his assumptions not antagonistic to facts, but aid in the explanation of them."

NELSON, JULIUS:

—Domestic Pasteurizing methods, and the care of milk in the home. N J aes b 152.

NEWMAN, C. L.:

—Oat experiments. Ark aes b 66.

PECK, CHARLES H.:

State Hall, Albany, N. Y.
—Report of the state botanist on edible fungi of New York. Memoir N. Y. state museum 3: 129-234, t 44-63, n 1900.

REMARK, FERDINAND:

—Der Kakteen freud. 32 p. 34 f. 50c.

RUMPLER, THEODOR:

—et Karl Schumann: Die Sukkulenten. Berlin 1892. 263 p. 139 f. 43.

SHIMEK, B.:

—The distribution of forest trees in Iowa. Ia ac pr 7:47-59. Reprint. 1 map. 20c.

SHUFFLETT, R. W.

—On the Osteology of the Striges (Strig-

idae and Bubonidae). Am phil soc pr 2: 695-722, t 10-17.

—On the Osteology of the Woodpeckers. Am phil soc pr 29: 578-632, t 9. 10 f.

From the author.

—The osteology of the cuckoos. Am phil SC pr 40: 4-51, t 1-2. Reprint.

STEARNS, R. E. C.

—Exotic mollusca in California. Science, 27 Ap 1900.

—The edible clams of the Pacific coast and a proposed method of transplanting them to the Atlantic coast. U. S. Fish Com b 3:353-362.

STUART, WILLIAM:

—Formalin as a preventive of oat smut. Purdue U aes b 87.

SUKESDORF, WILHELM:

Bingen, Washington.
—Zwei neue kalifornische Pflanzen.

WATTS, W. L.:

—Oil and gas yielding formations of California. State mining bureau b 19. 236 p. Illustrations and maps.

WITHTYCOMBE, J.:

—The silo and silage. Ore aes b 67.

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Stockholm, Sweden.
ACADEMY OF NAT. SCI. OF PHILA.: 19th and Race sts., Philadelphia, Pa.
AMERICAN ENTOMOLOGICAL SOC.: Philadelphia, Pa.

AUER, MUSEUM OF NAT. HISTORY:

Central Park, New York, N. Y.
ARGENTINA REPUBLIC: Museo Nacional de Buenos Aires.
Casilla del Correo No. 470.
Comunicaciones, Vol. 1, No. 8.

AUSTRALIAN MUSEUM:

Sydney, Australia.
BUFFALO SOC. OF NAT. SCIENCES: Buffalo, New York.

CALIFORNIA ACADEMY OF SCIENCES:

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DANA NATURAL HISTORY SOCIETY: Albany, New York.

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KANSAS STATE HISTORICAL SOC.:

Topeka, Kansas.
MASSACHUSETTS HORT. SOCIETY: No. 37 Tremont Bldg., Boston, Mass.

MEADVILLE SOC. OF NAT. HISTORY:

Meadville, Pennsylvania.
MERIDEN SCIENTIFIC ASSN.: Meriden, Connecticut.

MEXICO: Insituto Medico Nacional:

Jardin Carlos Pacheco 3, Mexico City.
--Anales, volumes I-IV.
MINNESOTA ACADEMY of Nat. Sci.: Minneapolis, Minnesota.

MISSOURI BOTANICAL GARDEN:

MUSEUM OF COMPARATIVE Zoology: Cambridge, Massachusetts.
NEW YORK STATE MUSEUM: 52d Ann R 1898, 1: 65 p. II: 139 p. III.

ROCHESTER ACADEMY OF SCIENCE:

Rochester, N. Y.
ROYAL GARDENS, Kew, England.
ROYAL MALACOLOGICAL SOCIETY: 10 Boulevard du Nord, Bruxelles, Belgium.

SAN DIEGO Society of Natural History:

San Diego, California.
SANTA BARBARA Soc. of Nat. History: Santa Barbara, California.

SMITHSONIAN INSTITUTION:

SCIENCE D'HORTICULTURE DU JAPON: 99 Minami-Inarimachi, Ehitaya, Takto, Japan.

SOCIETE SCIENTIFIQUE de CHILI:

538 Calle del Puente, Santiago, Chili.
SOCIETE ZOOLOGIQUE de FRANCE: SOUTHERN CALIF. Academy of Sci. Los Angeles, California.

TORREY BOTANICAL CLUB:

U. S. BUREAU OF EDUCATION: U. S. COAST and GEODETIC SURVEY: U. S. COMMISSIONER OF LABOR: U. S. FISH COMMISSION: U. S. GEOLOGICAL SURVEY: U. S. NATIONAL MUSEUM: WISCONSIN ACADEMY OF SCIENCES, ARTS AND LETTERS: Madison, Wisconsin.

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Journal of mycology

Californian illustr. magazine v 3 Feb '94

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AGRICULTURAL EXPERIMENT STATIONS.

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As many of the reports and bulletins are out of print, it is extremely difficult to obtain all that have been issued, and many are missing from our library, for which we would gladly give a liberal exchange.

Titles of these publications will appear in our Authors' List.

AGRICULTURAL Experiment Station: Auburn, Alabama.

Tuskegee station, Tuskegee, Ala.

Canebrake station, Uniontown, Ala.

AGRICULTURAL Experiment Station: Fayetteville, Arkansas.

Experiment station, Sitka, Alaska.

AGRICULTURAL Experiment Station: Berkeley, California.

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AGRICULTURAL Experiment Station: New Haven, Connecticut.

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Sugar planters station:

Honolulu, Hawaii.

AGRICULTURAL Experiment Station: Moscow, Idaho.

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North La. station, Calhoun, La.

Sugar station, Audubon park, N.Or., La.

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Fruit station, Mountain Grove, Mo.

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40 named tertiary fossils,

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BOTANY.

WEST AMERICAN BOTANY.

MIMULUS CLEVELANDI Brandege.

Perennial, suffrutescent at base, 3-6 dm. high, glandular-pubescent throughout; stems many from the base, sparingly branched above; leaves lanceolate, serrate, 3-7 cm. long, narrowing to the clasping base. In age revolute on the margins; flowers shortly pedicellate; calyx 2 cm. long, contracted above the ovary, the upper and longer portion curved and spreading, the lanceolate, somewhat unequal teeth $\frac{1}{2}$ the length of the tube; corolla golden yellow, nearly twice the length of the calyx, with gradually dilated throat and widely spreading nearly equal lips; styles stout, minutely and densely glandular; stigma tubular-peltate; mature capsule 10-12 mm. long, nearly quadrangular, tapering slightly toward the apex, opening to the base by the upper suture, the lower separating for only a short distance from the tip, and each valve splitting at the tip for nearly the same distance as the lower suture; placentae separate, as in *M. glutinosus*; seeds toveo-a-e, apiculate at both ends. — T. S. Brandege, Garden and Forest, 2:151, f. 20 (3 Ap 1895).

South side of Cuyamaca peak, San Diego county, California.

BROMUS MAXIMUS Desf.

Type from northern Africa. Stanford University (C. Ritter 205), California.

Var. **GUSSONI** Parl.

Bromus gussoni Parl. Rar. Pl. Sic. 2: 8 (1849).

Bromus sterilis Gus. Fl. Sic. Prod. Suppl. 1: 27 (1832).

Larger than the type, 4-7 dm. tall, larger and more lax panicle, 1-2 dm. long, with the upper part somewhat drooping. Arizona, California, Washington. In-cult 1059.

Introduced. San Diego, California (Orchaeo).

CHAELOCHLOA GLAUCA Scribn.

Setaria glauca Beauv. Agrost. 51 (1812).

Panicum glaucum L. sp. Pl. 55 (1753).

Chamaeraphis glauca Kuntze Rev. Gen. Pl. 2: 767 (1891).

Isophorus glaucus Nash Torr bot. cl. b. 2:423 (1896).

PROMUS UNIOLOIDES HBK.

Annual, or sometimes perennial, 3-4 ft. high, several stems from same base; panicle large and spreading, spikelets about 1 inch long, $\frac{1}{4}$ wide, composed of 2-11 florets overlapping each other; flowering glumes coarse in texture, strongly nerved, usually bearing a short awn about 3 mm. long. Rescue grass. Widely distributed in South and Central America, Mexico, Southern Texas, and naturalized or cultivated in the southern United States, Europe, and Australia. Known also by the names Iverson's, California prairie, Schrader's brome, and Arctic grass, Australian oats, etc.

BROMUS HORDEACEUS L.

Bromus mollis L. Sp. pl. ed. 1, 1:112 (1762).

Serrafalcus mollis Parl. Fl. Ital. 1:356

(1842).

Erect or ascending annual or biennial with a rather dense, erect panicle; culms about 2-8 dm high, usually somewhat pubescent at the nodes; sheaths retrose-ly soft pilose-pubescent; ligule 1.5-2 mm. long, lacinate; blades linear, pilose-pubescent to nearly smooth, about 5-15 cm long and 3-5 mm broad; panicle contracted, narrow pyramidal, 5-10 cm long, 2-4 broad; branches somewhat spreading in flower; spikelets 5-13 flowered, ovate-lanceolate, becoming obtuse, 12-15 mm long, 4-6 wide, with short pedicels; empty glumes broad, obtuse, coarsely pilose or scabrous-pubescent, the lower 3-5-nerved, 4-6 mm long, the upper 5-7-nerved, 7-3 mm long; flowering glume broad, obtuse, 7-nerved, coarsely pilose or scabrous-pubescent, rather deeply bidentate, margin and apex hyaline, 8-9 mm long; awn rather stout, rough, flattened toward the base, straight at first, frequently somewhat twisted when old, about 6-9 mm long; palea a little more than $\frac{3}{4}$ the length of its glume.

Southern Europe; introduced sparingly from Maine to Virginia, abundantly on the Pacific coast, from Washington, to Los Angeles, California.

BROMUS TRINII Desv.

Trisetum hirtum Trin. Linnæa 10:300 (1833).

Trisetum barbatum Steud. Syn. Pl. Gram. 229 (1851).

Bromus barbatoideus Beal Grass N. A. 2:611 (1876).

California; Colorado; Chili.

Var. **PALLIDIFLORUS** Desv.

Bromus barbatorides sulcatus Beal Grass N. A. 2:615 (1896).

Trisetum barbatum major Vasey in herb. Beal Grass N. A. 2:615 (1896).

Robust, 6-12 dm high, panicle much elongated, 2-4 dm long; branches mostly 6-8 at the lower whorls, weak and spreading; leaves broadly linear lanceolate, smooth or somewhat sparsely pilose-pubescent, as are the sheaths.

Type from the Andes of southern Chili, Chollas valley, San Diego (Orcutt 1064), Pasadena (C. D. Allen, in 1885), and San Nicolas Island (Balche Trask 15), California.

PLANTAGO PICTA Morris.

Utah, Arizona, Southern California (Parrish 2643).

PLANTAGO OBLONGA Morris.

Colorado Desert, California (Orcutt).

PLANTAGO IGNOTA Morris.

Ft. Verde, Arizona (E. A. Mearns 199); northern Baja California.

PLANTAGO SPECIOSA Morris.

Santa Catalina Island, California (G. B. Grant 2412).

PLANTAGO OBLERSA Morris.

Del Mar, San Diego County, California (Belle Sumner Angier 21).

Plantago erecta Morris in part; Torr bot. cl. b. 27:118 (1900).

PLANTAGO ERECTA Morr's.

Plantago patagonica Californica Greene Men bay reg. 236 (1894).

California; Oregon.

MOHAVE DESERT IRON MINES.

In May, 1882, the writer first visited the region known as the Mohave desert, in San Bernardino county, California, and found it to be in fact a delightful garden, filled with a great variety of brilliantly colored flowers. The usually leafless and thorny shrubs were a mass of deep indigo flowers, while each open space displayed a bed of delicate annuals unknown to more favored localities.

The mountains on either hand of the Cajon Pass were still covered partially with snow, darkened with the masses of evergreen—spruce, cedar and pine, which render these peaks a delight in summer to the pleasure seeker.

The tree yucca, the wild datile, and large quantities of juniper, growing over a large part of these slopes, render the name desert somewhat of a misnomer; as one leaves the base of the mountains, however, large areas of very uninteresting country—from a horticultural standpoint—are met with, but the wealth of its minerals will be found a redeeming character.

About 16 miles due south from a point midway between Newberry and Hazlett stations, 275 miles from San Diego, Cal., and 180 miles from Los Angeles, Cal., by the Santa Fe route, occurs probably the largest deposit of iron ores on the Pacific Coast. It is variously estimated by conservative men that fifty to one hundred million tons of magnetic and hematite ores lie above and convenient to a suitable railway grade, which can be quarried rather than mined—if we restrict the word mining to the English sense of underground workings.

The writer is indebted to Mr. H. C. Gordon, of San Diego, Cal., one of the owners in this vast property, for many of the facts here presented concerning the Bessemer Iron District, the 320 acres of patented lands covering the more valuable and accessible portions of this remarkable body of ores.

The chief chemist of the U. S. Geological Survey, after an examination of the magnetite, says: "A very high grade of magnetic ore with but a trace of titanium."

Prof. Pierce de P. Ricketts, the well

known ex-chief of the school of mines and metallurgy, of Columbia College, New York, secured the following results from an examination made for the following elements only: Metallic Iron, 68.48; Manganese, .038; Sulphur, .076; Titanium, .02; Phosphorus, (trace) per centum.

Prof. Woulfe, chemist of the Union Iron Works, San Francisco, Cal., secured the following results from a car load each of the Magnetite (M) and Hematite (H): Sesqui oxide of iron, M 68.8, H 81.94; Proto oxide of iron, M 25.5, H 8.28; Alumina, M 2.843, H 3.24; Manganese oxide, M .52, H .43; Lime, M .72, H .82; Magnesia, M 3.83, H 3.18; Phosphorus anhydride, M .012, H .066; Sulphur, M .038, H .47; Silica, M .845, H .061 per centum.

Samples of surface ores from all the workings, aggregating 50 lbs. gave: Iron, 66.25; Silica, 1.65; Lime, 1.35; Magnesia, 3.3; Sulphur, .031; Phosphoric acid, .554; Tannic acid, 0; Alumina, .84; Manganese, .25; Iron peroxide, 72.21; Iron proto oxide, 20.16; Manganese oxide, .39; and Phosphorus, .024 per cent. (analysis by Mr. Curry, of Pittsburg, Pa.).

There is an abundance of good water at the junction of a proposed railway to the mines with the Santa Fe, and a good supply can probably be developed on or near the property. A uniform grade of one (not to exceed three) per cent., with no cuts, fills or expensive bridging makes a connection with the existing railroads comparatively easy of accomplishment. The cost of mining the ore is estimated not to exceed 50 cents per ton f. o. b., and freight to tide water, \$2 per ton. Fuel and timber can be obtained in large quantities from the mountains in sight, estimated to be about 8 miles away.

The 9th and 11th reports of the California state mineralogist give very able and conservative estimates of the quantity and quality of the ore bodies.

The recent discovery of oil at Victor, on the Mohave desert, should hasten the development of our latent iron industries, which have lain dormant for an abnormal period, owing in part to the death of one of the owners in these iron lands.

C. R. ORCUTT.

PERIODICALS.

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There are many scientific and popular magazines which we desire to obtain by purchase or exchange to complete files.

All classes of printed matter bought, sold, loaned or exchanged.

ORCUTT, San Diego, California.

MINES.

CLEVELAND COPPER GROUP.

One claim of 20.66 acres, patented.
Four contiguous claims, unpatented.
Total area: 88 acres, 4,533 square feet.
Located on the west side of the Penos Altos range, Penos Altos mining district, Grant county, New Mexico, 2 miles west of the town of Penos Altos, and 8 miles north of Silver City, the county seat and railroad station. Altitude, 7,500 feet. Altitude of Silver City, 6,000 feet.
Good roads from Silver City to the mines.

Permanent water on the mines for camp use; sufficient to run a large smelting plant can be developed at a small expense.

Porphyritic-syenite hanging and foot walls with quartzite, porphyry, syenite, dolomite (lime), porphyrite, iron and quartz alternating between the several ore bodies. The ore bodies vary in width from 2 to 150 feet each, iron capped and in places quartz. The surface shows the copper ore in bunches in the strata varying from 1 to 10 feet wide. The character of the ore is copper-iron carbonates, showing a little native and oxides of copper, and copper sulphides below the water level, the latter carrying a large percentage of iron and zinc at the south end of the ground, where a tunnel is run. The zinc only shows at this end and will disappear at depth, as is evidenced nearby.

Ores free smelting, 3 to 60 per cent. copper, containing lime in a few places adjoining dolomite wall. Shipments of ore average 8 to 13 per cent. copper, iron and silica neutral.

Ore can be marketed at the Silver City reduction works.

Cost of mining, assaying and hauling to Silver City estimated at \$6 per ton on

small shipments; smelting charges \$6 per ton. On large shipments, after development, the cost will be reduced 25 per cent.

Net profit per ton (on a 10 per cent. ore) estimated at \$12.

A 3 per cent. copper ore can be smelted on the ground and marketed in the east at a profit.

This great deposit has the same geological and mineralogical characteristics of the mines of Clifton, Arizona, and the Copper Queen mine, of Bisbee, Arizona. Copper in this formation does not play out, but gets richer and better defined as depth is attained, the ore existing in surface bunches and chambers, and ore shoots below the water level.

The trend of the ore bodies and formation is N. E. Surface dip of ore bodies is 31 to 40 degrees N. W. from the vertical towards the vertical hanging wall. Development shows the same to be both vertical and dip S. E. into the mountain at depth.

Very little gold and silver is found in these surface ores. Silver 6 to 7 oz.; gold 8 to \$3 per ton.

Surface workings, cuts, shafts and tunnels, from 5 to 100 feet each in length or depth, have been made by old-time gold hunters and the present owners in mining surface ores, which show the formation, ore bodies in place, and their permanency.

A 20-foot open cut, and 220 feet of tunnel, crosscutting 3 ore bodies on the south end of the copper, extending below water level, has been made; approximate depth attained, 125 feet.

Very little timbering will be required. Pine, oak and juniper wood for all purposes on the ground. Wood can be purchased for \$2 per cord.

This group of copper mines embraces the only fluxing copper ores in the district. The expenditure of \$1,000 in development will probably open up pay ore bodies of chalcopyrite in the extension of the tunnel.

Price, \$50,000; six months' developing bond; shipping privileges.

UTTER, GEORGE H.:

Silver City, New Mexico.

THE WEST AMERICAN MINING AND EXPLORATION ASSOCIATION.

San Diego, California.

The objects of this association are to further the systematic and scientific exploration of West America, and to foster and promote in every legitimate manner the various branches of the mineral industries. There are hundreds of undeveloped mineral properties in the western United States and Mexico, containing gold, silver, copper, iron, lead, and other metals, or valuable minerals, waiting for some one

with capital and business judgment to turn them into paying mines. No investment yields better returns than a good mine. But there are thousands of alleged mines or prospects, and many fortunes have been spent on worthless claims, while valuable properties are often ignored for years, until chance or education reveals their value.

There are few mines for the poor man. It takes money to operate on a scale commensurate with the business involved. It is a common saying that "mines are made, not found." Ignorance and insufficient means, are the two rocks upon which many mining enterprises have been wrecked.

Many valuable claims can be bought for a small sum. Often the controlling interest can be obtained without other consideration than an agreement to do a certain amount of development work, sufficient to demonstrate the value of the property. Conditions are now favorable for working many mines, abandoned years ago, when facilities for transportation, or for the treatment of certain classes of ore, did not exist.

The association is formed to "prospect for prospects"—to secure an exhaustive investigation and conservative reports upon mines and mineral lands, and to locate, purchase, or otherwise acquire such as prove of value, and to develop, operate and sell; also to buy and sell real estate, to buy, sell and deal in minerals, gems, rocks, ores and metals, and general merchandise, when found desirable, to erect smelters, mills and factories, and to engage in other business that may further its aims.

The success of the enterprise depends greatly upon the ability, judgment and honesty of the managers—points of vital interest to the intending investor. Economical, intelligent, honest effort will win success. No offers of "a sure thing", no big promises of things uncertain of accomplishment, will mar the simple statement of faith in legitimate mining as a business. Hundreds of claims may be examined before one of true worth is found, but a single success will abundantly reimburse the association for

many failures. By keeping in touch with the mineral industries in Europe and America, and employing the services of specialists of known reputation, the expensive experiences and failures due to ignorance, should be avoided.

A capital stock of half a million shares, of the par value of \$1.00 each, sold only at par, and the proceeds applied in an economical manner wholly in furtherance of these plans, should place the association on a firm financial basis.

Subscriptions of from one to one hundred dollars per month are invited, to terminate whenever the assessed value of the property of the association shall equal its capital stock, all unsold shares to be then withdrawn from sale. All stock will thus be fully paid and nonassessable.

It is the desire of the association to keep in close touch with prospectors and discoverers of valuable mineral deposits. It is not the intention to employ or "grub stake" prospectors, or to purchase with stock properties of unknown value at fictitious prices. The aim instead is to facilitate the development and utilization of properties of merit. Thus it is hoped to earn an interest in valuable mines, or acquire by purchase at moderate cost, properties that from a lack of means or a limited knowledge, might otherwise remain untouched. The association will also act as brokers for the owners of developed mines. In this way the interests of the prospector, the mine owner, and the investor, may be best efficiently served.

Subscriptions will be received by the following agencies:—
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METALS AND ORES.

ANTIMONY—An ore carrying about 38 to 40 per cent of this metal, and from

\$5 to \$30 per ton in gold, occurs near San Diego, and awaits development.

CAESIUM—A rare metal contained in minute quantities in lepidolite. It would prove useful if an available supply existed.

LITHIUM.—Ambygonite, lepidolite, spodumene, and triphylite are the principal ores of this rare metal, the lightest known.

PLATINUM.—The constantly increasing demand for this widely distributed metal in the arts and manufactures of the world, and the present limited sources of supply, have in recent years greatly enhanced its price; about 80 per cent. of the present supply is derived from the alluvial deposits of the Ural mountains, but there are few if any of the gold-bearing gravel beds of the world that have failed to yield this metal. Platinum ore is usually found in the form of rounded or flattened grain or "sand," occasionally in irregular lumps of the size of peas; large nuggets are very rare—the largest as yet found weighing 21 pounds. The largest ever found in America weighed nearly 2 pounds.

QUICKSILVER.—Cinnabar is the principal ore.

RUBIDIUM—One of the rare metals, more precious than gold, occurs as a by-product of the lithia mines.

REAL ESTATE.

PAUMA.

The Pauma rancho, in San Diego county, California, is situated in the upper San Luis Rey valley, about 55 miles north and east of San Diego City, and may be reached by the Southern California railway to Escondido, thence by team, about 15 miles, on a good county road. One of the finest and best watered ranches in the state, containing 13,100 acres (title perfect—a Mexican grant, confirmed by the United States).

The Pauma creek, which flows into the San Luis Rey river, is a large and constant stream. An Indian village is located on the banks of this stream, whose waters they use for irrigating purposes. The creek and river run for several miles through the ranch, affording ample supply for irrigation,

further supplemented by several large springs of crystal water.

The land is adapted to the growth of vines and fruit trees in the highest perfection; 5,000 acres are valley land, especially adapted to the culture of corn, alfalfa, grain and fruits; 300 acres are a mesa or table land, particularly suitable for oranges, olives, figs, and the raisin grape; the remainder excellent grazing and bee range, with an abundance of wood and water.

This picturesque section has for years been the property of the Catholic Bishop of Southern California. Planted to trees and vines, and properly cultivated, and stocked with cattle, horses, and bees, a princely income could be derived from this magnificent estate, or it could be converted into a thriving community, supporting many happy homes.

This beautiful ranch is now for sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California, who will be pleased to furnish our readers with further particulars, price and terms, on mention of this magazine.

SAN DIEGUITO.

The Rancho San Dieguito contains 8,132 acres, of which about 7,000 are capable of a high degree of cultivation. About 2,500 acres are of the finest bottom land, especially adapted for corn, beans, vegetables, and alfalfa; the mesa lands now have oranges, lemons, figs, guavas, olives, apricots, peaches, walnuts and grapes in bearing.

The San Dieguito river and San Elijo creek run through the property, affording ample supply of water for irrigation, supplemented by a good spring, and wells from 6 to 20 feet deep. Cottonwood and willows furnish an abundance of wood.

Three houses, 2 barns, blacksmith shop, and other buildings, tools, wagons, etc., for sale with the ranch, which is now leased for \$2,500.00 a year—optional with purchaser to take possession in 30 days. Price \$8.00 an acre.

For sale by the H. C. Gordon Land Company, No. 1202 Fourth street, San Diego, California.

RANCHO DE SAN YSIDRO.

Six square leagues (26,628 acres) of fertile land, with creeks of running water and perennial springs, an old adobe house, and primeval orchard of olives, oranges, lemons, figs and grapes, situated in Mexico, about 20 miles south and east of San Diego City, California, is an estate that might well captivate the fancy of any eastern home seeker.

One-third of the land is adapted to cultivation, the balance grazing land. Quartz and placer gold mines, mineral water, abundant wood, and a perfect climate, are among the attractions.

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Wanted—One peso of Paraguay.
5 frs os Helvetia.
ORCUTT, San Diego, California.

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Shells to exchange for shells.

Prices are for single specimens in good condition—slightly imperfect at 1/2 price. Exchanges for books, magazines, etc.

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<i>depicta</i>	10
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<i>scabra & v limatula</i>	05
<i>spectrum</i>	05
<i>Alexia myosotis setifer</i>	05
<i>Alycaeus longituba</i> Mts	40
<i>jagori</i> Web.	60
<i>Amiantis callosa</i>	30
<i>Amnicola dupotetiana, limosa</i>	05
<i>longinqua, paluda, protea</i>	05
<i>Amphidromus palaceus</i>	80
<i>semirugosus</i> Bttgr.....	50
<i>Ampullaria cumingii</i> Sby.	75
<i>Anchidra porcellanus</i> Mouss.....	30
<i>Anculosa rubiginosa</i>	05
<i>Ancylus deperditus, fluvialilis, lacustris, paralelus, rivularis</i>	05
<i>Anodonta edentula</i> 10, <i>ferrusaciana, undulata</i>	05
<i>Arca americana</i> 20, <i>incongrua</i> 10, <i>occidentalis</i> 15, <i>plexata</i>	10
<i>Auricula elongata</i> 20, <i>midæ</i>	1 00
<i>Parleeia subtenuis</i>	05
<i>Bittium nigrum</i> Totten.....	04

Buccinum glaciale.....	20	Lottia gigantea Gray.....	05
Bulinus lubricus.....	03	Macoma nasuta Conr.....	30
Rulinus hypnornm.....	05	Macron Kellettii Forbes.....	50
Busycon perversum.....	15	Murex pomum Gmel.....	10
Bythinella binneyi, intermedia.....	05	adustus Lam.....	25
Bythinia tentaculata.....	05	bicolor.....	25
Callopona tessellatum Reeve.....	25	brevifrons.....	15
Cardita affinis Brod.....	35	plicatus Sby.....	30
Cerithium muscarum Gmel.....	10	Mytilus pellucidus.....	10
Chiton dentiens Gould.....	10	Nacella depicta &c.—see Acmaea.	
Hartwegii Cpr.....	10	Nassa luteostoma B. & S.....	20
ciliata Sby. (mucosa Gould).....	25	Natica bifasciata Gray.....	40
lanuginosus Cpr.....	25	Pritchardii Fbs.....	30
conspicua Cpr.....	20	uber Val.....	20
pectinulatus Cpr.....	15	Nerita Bernhardi Recl.....	15
scabra Reeve.....	15	Neritina diadema Real.....	20
Clausilia junghuhni Phil.....	30	tessellata Law. v. maculifera Mouss.....	20
javana v. planispira Bttgr.....	30	Neritina picta.....	10
Conohelix conicus Schum.....	50	reclivata Say.....	05
Conus abbreviatus.....	20	viridis Lam.....	10
eburneus Brug.....	30	Norrissia Norrissi Sby.....	25
imperialis L.....	1 50	Nitidella cribraria Lam.....	20
marmoratus L.....	50	Oliva venulata Lam.....	10
proteus Hwass.....	50	Olivella anazora Duclos.....	15
Crepidula unguiformis Say.....	05	bellula.....	20
Cycas achatinaceum Pfr.....	40	dama Mawe.....	10
Cypraea helvola L.....	15	gracilis Gray.....	20
caurica L.....	30	tergina Duclos.....	10
rotunda Kiener.....	30	zonalis Lam.....	10
moneta, 'African money'.....	05	oryza Lam.....	05
Sowerbyi Kiener.....	1 00	mutica Say.....	05
Diplomatina auriculata Bttgr.....	60	Omphalius ligulatus Menke.....	15
Dosinia ponderosa Gray.....	40	Opeas achatinaceum Pir.....	30
Engina carbonaria Reeve.....	20	Patella magellanica.....	25
Georissa javana Bttgr.....	80	viridula Lam.....	20
Helix rosatoria.....	30	variabilis Sby.....	20
leucomphala Bttgr.....	30	Planaxis lineolatus Gld.....	20
subsularis Nts.....	30	planicostata Sby.....	20
semernensis Mouss.....	40	nigritella Fbs.....	20
Hemicardium unedo L.....	60	lineatus Da Costa.....	20
Hemiplecta centralis Mouss.....	80	Planorbis compressus Shutt.....	20
Hypsostoma Fruhstorferi Bttgr.....	40	Pleurotoma olivacea Sby.....	50
Kadiella ambliæ, indifferus, convescoconica, viritula Bttgr. each	20	Prosopas acutissimum Mouss.....	30
Lagochilus grandipilum Bttgr.....	25	Protinula violacea King.....	40
Limnæus javanicus v. teuggerious	20	Psammobia rubroradiata Conr.....	75
v. ventrosa W.....	15	vespertina Chemn.....	10
Limnæa adelinæ Tryon.....	20	Pupina bipalatalis Bttgr.....	20
Littorina Phillippii Cpr.....	15	sucinaces.....	20

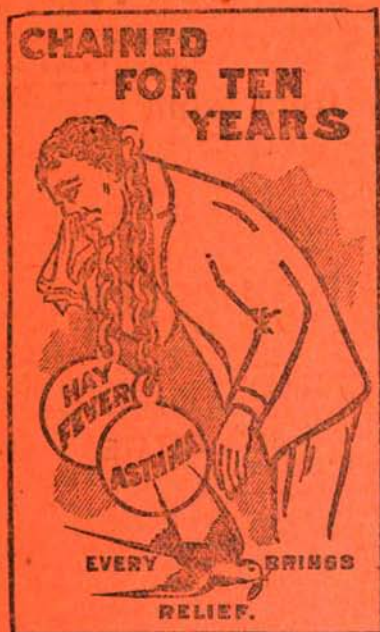
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Rev. Dr. Merris Wechsler

Rabbi of the Cong. Bnai Israel.

New York, January 3 1901.

DRS. TAFT BROS.' MEDICINE CO.

Gentlemen: Your Asthmalene is an excellent remedy for Asthma and Hay Fever, and its composition alleviates all troubles which combine with Asthma. Its success is astonishing and wonderful.

After having it carefully analyzed, we can state that Asthmalene contains no opium, morphine, chloroform or ether.

Very truly yours, REV. DR. MORRIS WECHSLER.

DR. TAFT BROS. MEDICINE CO.

AVON SPRINGS, N. Y., Feb. 1, 1901.

Gentlemen: I write this testimonial from a sense of duty, having tested the wonderful effect of your Asthmalene, for the cure of Asthma. My wife has been afflicted with spasmodic asthma for the past 12 years. Having exhausted my own skills as well as many others, I chanced to see your sign upon your windows on 12th street New York. I at once obtained a bottle of Asthmalene. My wife commenced taking it about the first of November. I very soon noticed a radical improvement. After using one bottle her Asthma had disappeared and she is entirely free from all symptoms. I feel that I can consistently recommend the medicine to all who are afflicted with this distressing disease.

Yours respectfully, O. D. PHELPS, M. D.

DR. TAFT BROS. MEDICINE CO.

67 E. 129th st., N. Y., Feb. 5, 1901.

Gentlemen: I was troubled with Asthma for 22 years. I have tried numerous remedies, but they have all failed. I ran across your advertisement and started with a trial bottle. I found relief at once. I have since purchased your full-size bottle, and I am ever grateful. I have a family of 4 children, and for 6 years was unable to work. I am now in the best of health and am doing business every day. This testimony you can make such use of as you see fit.

Home address, 25 Rivington street.

S. RAPHAEL.

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About properties which have been in our hands for disposal, are mines or 'prospects' in great variety, including Antimony, Copper, Gold, Iron, Lithium, Marble, Mica, Molybdenite, Nickel, Sulphur, Wolframite, Zinc, etc.

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The editor reported to the State mining bureau in 1890 (10th report, 905), on the Colorado Desert:— 'The formation in certain sections seems very promising [for the producing of petroleum].

About half a million acres have been taken up for oil in the past few months. The editor is in a company claiming over 20,000 acres. Yes, stock will soon be for sale. Land also.

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Botany of Southern California' is a pamphlet of about 70 pages, by Charles Russell Orcutt, editor of the West American Scientist, San Diego, California, containing a provisional check-list of the known species, with descriptions and economic notes concerning many. \$1

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A free milling gold "prospect" has been placed in our hands for sale, said to have an 85-foot shaft, and other workings, with a 5-foot ledge of ore assaying \$12.50 per ton. Good roads, wood and water. Price, \$20,000. An examination and conservative report will be made on reasonable terms. Address the editor.

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The West American Scientist.

Vol. XII. No. 6.

November, 1901.

Whole No. 107.

Established 1884.

THE WEST AMERICAN SCIENTIST.

Published monthly.

Price 10c a copy; \$1 a year; \$10 for life.

Charles Russell Orcutt, Editor.

Number 365 Twenty-first Street,
San Diego, California, U. S. A.

WEST AMERICAN MOLLUSCA.

COCHLICOPA LUBRICA Muell.

Ferrussacia subcylindrica L.
Grizzly Peak, Berkeley, Cal. (H. Hemp-
hill); Oregon; Alaska.

COCHLIOPA ROWELLII Tryon.

Shell depressed, wider than high, whorls $\frac{3}{4}$, regularly convex, rapidly enlarging; spire small, slightly elevated, apex acute, sutures well marked; base convex, except that region around umbilicus is flattened and inclined toward the axis, its outer boundary marked thus by an angle; umbilicus small, very distinct; aperture half ovate, labrum well rounded, thin, labium slightly rounded, thickened, elevated from body whorl forming an acute angle with the labrum above, and not impinging on the umbilicus. Color yellowish-green. Operculum paucispiral. Height $\frac{2}{3}$, larger diameter 4, smaller $\frac{3}{4}$ mm.

Living: Clear lake, California? Panama?

MELAMPUS OLIVACEUS Cpr.

Obconic; spire short, suture indistinct; whorls 7-9, obtusely angulated on the body below the suture; aperture long and narrow, lip covered with sharp laminae within, parietal wall with from 1 to 3 small revolving laminae; there is also a stout fold on the columella. Epidermis olivaceous, below which the color is white with patches or revolving lines of red. Length 13, diameter 8 mm.

Living: San Diego, California to Mexican.

PEDIPES LIRATA, W. G. Binney.

Shell globose conical, solid, with regular spiral lines; spire short, with obtuse apex; whorls 3, the upper ones small, the last equalling five-sixths of the total length; aperture semicircular; parietal wall with strong transverse lamina, columella with 2 acute approximate teeth. White or yellowish. Length 3.3, diameter 2.5 mm.

Living: San Diego, California (Orcutt).
Cape San Lucas, Baja California.

SCALA STEARNSII Dall.

Pliocene: Pacific Beach, San Diego, Calif. (Stearns, 1887).

Stearns, Wagner Free Inst tr III, pt 2:245 t 21 f 4 (1892).

SELENITES CAELATA Maszyck.

Shell small, depressed, brownish horn-color, with very coarse, rough, crowded, subaequidistant, irregular ribs, which are obsolete at the apex; whorls 4, rounded, somewhat inflated below, gradually increasing, the last not descending at the aperture; suture impressed; umbilicus wide, clearly exhibiting all the volutions; aperture almost circular, slightly oblique; peristome simple, its ends approaching and joined by a very thin, transparent, whitish callus, through which the ribs are distinctly seen. Greater diameter 4, height 1.75 mm. Santa Barbara (Dr. L. G. Yates); Hayward's, Alameda county, California (W. H. Dall).

Maszyck, U S Na Mu pr 9:460-461, f 1888.

SELENITES DURANTI.

Maszyck, U S Na Mu pr 9:460-1 f (1886).
Helix *duranti* Newcomb, Ca ac pr 3:118 (1864).

Patula *duranti* Tyron, Am J Conch 2:262, t 4 f 53 (1866). Mong. T. M. 51, t 4 f 53.

Hyalina *duranti* Binney and Bland L-F S 1:37, f 49 (1869).

Macrocyllis *duranti* W G Binn T M 5:94, 188. Man Am L 9 86 f 49 (1885).

"Shell depressed, discoidal, pale corneous, under the lens minutely striated, opaque, broadly and perspective umbilicated; whorls 4, the last shelving but not descending (at the aperture); suture linear; aperture rounded, lunate, lip simple, the external and internal approaching. Santa Barbara Island."—Newcomb.

Tyron says: "spire not at all elevated, perfectly plane above."

Binney says: "with very coarse rough striae."

Diameter 5, height 1.75 mm.

Pilsbry, Phila ac pr 1889, p 196, treats *Selenites caelata* Maszyck as a variety of this.

SELENITES HEMPHILLI W. G. Binn.

Eastern Oregon; Washington.

SELENITES SPORTELLA Gould.

Tyron, Mong T M 33, t 3 f 7.

Macrocyclus sportella Gould.

Whorls 5, the superior part of the last one flattened upon approaching the aperture, rounded below; very light apple green, dull, very closely and sharply striate, reticulated by slight, revolving lines; suture moderate, umbilicus moderate and deep. Diameter 18 mm. Puget Sound to San Diego, California (Orcutt).

SELENITES VANCOUVERENIS Lea.

Large, whorls 5, the superior part of the last one flattened upon approaching the aperture, rounded beneath; bright yellowish-green, shining, roughly striate, with very slight revolving lines, suture moderate, umbilicus of moderate width and deep. Diameter 30 mm. Oregon; Washington; Alaska; western Idaho.

Macrocyclus vancouverensis Lea.

Tryon, Mong T M 33, t 3 f 6.

SELENITES VOYANA Newc.

Depressed; whorls 5, convex, the last declining towards the aperture and somewhat flattened or concave above, striate; aperture sinuate above, the lip slightly expanded, its extremities joined by a callus on the body whorl; below broadly umbilicate. Pale horn color. Diameter 12.5 mm. San Diego to Trinity county, California.

Macrocyclus voyana Newcomb.

Tryon, Mong T M 34, t 3 f 9.

SPORTELLA STEARNSII Dall.

"Shell of moderate size for the genus, inequilateral, not very convex, white, with an almost imperceptible yellowish epidermis; anterior dorsal margin nearly straight, the base parallel with it, the ends bluntly rounded; surface nearly smooth, with faint incremental lines and microscopic sagrination; teeth normal, strong, the posterior cardinal prominent, vertical; ligament strong, external, on a nymph; resilium well developed, its area of attachment thickened; posterior adductor scar rounded, unusually large. Lon. 13.5, alt. 10, diam. 5 mm. One well-preserved specimen from the Gulf of California, exact locality unknown, is contained in the Stearns collection."—Dall, U S Na Mu pr 21: 885, 879, t 87, f 8, 12 (1899).

SUCCINEA STRECHIANA Bland.

Keep, West Coast shells, 129.

Tryon, Monog T M 19, t 2 f 5.

Globose-conic, thin, pellucid, shining, striatulate; spire short, obtuse, suture well impressed; whorls 3, convex, last inflated; aperture roundly oval, columella arcuate, slightly thickened. Greenish horn color. Length 6.25, diameter 5 mm.

Sub-alpine Sierra Nevada, California and Nevada, 4,000 to 6,500 feet altitude.

MYSELLA ALEUTICA Dall.

"Shell small, solid, ovate, white, smooth, covered with a polished straw-colored epidermis with usually 3 or 4 concentric darker colored zones; beaks distinct, often eroded, ends and base rounded, valves moderately convex, teeth strong in the right valve, anterior adductor scar narrow and rather irregular, elongated, posterior rounded, pallial scar linear. Lon. 4.3, alt. 3.3, diam. 2 mm. Bering sea, the Aleutians,

and east to Sitka bay, Alaska."—Dall, U S Na Mu pr 21: 892-3, 881, t 87 f 6 (1899).

MYSELLA PEDROANA Dall.

"Shell large, thin, rounded, rather compressed, white, with a concentric rugose pale-brownish epidermis (to which, in the type, adheres a good deal of blackish oxide of iron); beaks inconspicuous; surface with coarse, concentric, incremental lines; inequilateral; the posterior side short, dorsal margins merging roundly into the distal and they into the basal margin, which last is nearly straight; hinge feeble, the right anterior lamella elongated and very slender, the posterior one shorter and stouter, the resilium subumbonal and very small; adductor scars small, the pallial scar linear. Lon. 9, alt. 7.3, diam. 3 mm. A single shell found on the beach at San Pedro, California."—Dall U S Na Mu pr 21: 893, 881, t 88 f 4 (1899).

MYSELLA PLANATA Dall.

Dall, U S Na Mu pr 881, 892 t 88 f 12 (1899).

Tellimya planata Dall, in Krause; Beitr Moll fauna des Beringsmeers, Arch f Naturg 51 pt 1: 34, t 3 f 6 a-d (1885).

Bering Strait, south to the Aleutians and east to the Shumagin Islands, Alaska.

MYSELLA TUMIDA Cpr.

Dall, U S Na Mu pr 21: 881, 892, t 87 f 7 (1899).

Tellimya tumida Cpr, Suppl R Brit Assoc 1863: 88, 97, 129 (1864). Phila ac pr 1865: 58.

Alaska peninsula, south to San Diego, California.

ERYCINA COMPRESSA Dall.

"Shell large, subquadrate, thin, moderately compressed, white, covered with a conspicuous, thin, wrinkled, partly glossy periostracum; nearly equilateral, the posterior end slightly broader, both ends rounded, the basal margin nearly straight; beaks inconspicuous, surface with strong, irregular incremental lines, but no radial sculpture; pallial scar rather wide and irregular, merging into the subequal, rather narrow adductor scars; resilium large, wide, and long, more or less calcareous ventrally, left valve with one obscure cardinal tooth, right valve with the tooth better developed; the right dorsal valve margins overlap those of the left valve a little, but there are no distinct lamellae. Lon. 13, alt. 13, diam. 6 mm. Dredged on muddy bottom in from 4 to 28 fathoms in the eastern part of Bering sea, south of Nunivak Island, the eastern Aleutians, and southward to Sitka, Alaska, by W. H. Dall."—Dall, U S Na Mu pr 21: 888, 883, t 87, f 1, 8 (1899).

ERYCINA RUGIFERA Cpr.

Dall U S Na Mu pr 21: 887, 880, t 87 f 4 (1899).

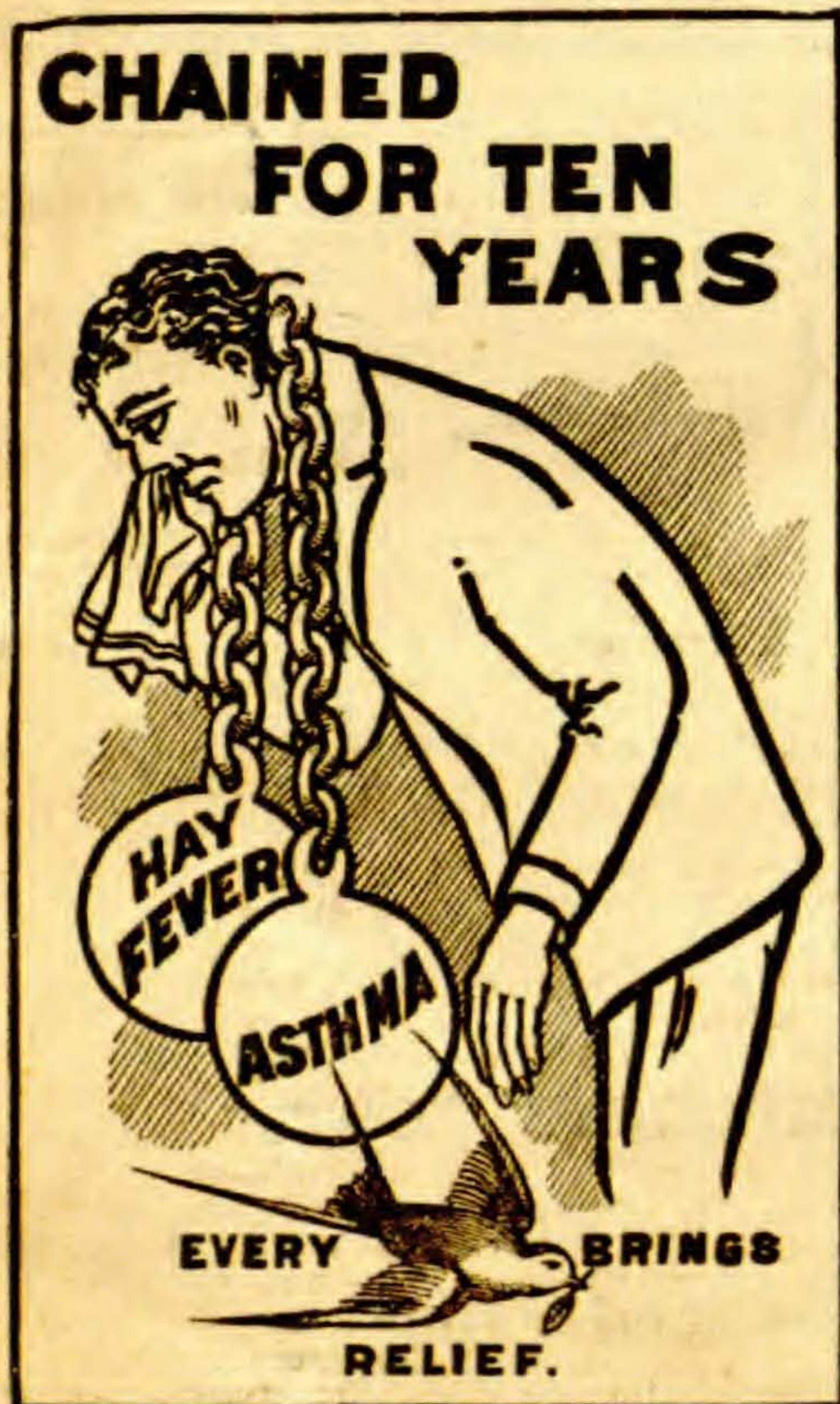
Pythina rugifera Cpr Supple R Brit Assoc 1863: 602, 643 (1864). Phila ac pr 1865: 57.

Lepton rude (Dall ms) Whiteaves R Progr Geol Surv Canada 1878-79: 198 B, f 2 (1880).

Lives attached to the abdomen of *Gebia pugetensis* Dane, a burrowing crustacean. Puget Sound.

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Yours respectfully, **O. D. PHELPS, M. D.**

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S. RAPHAEL.

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The West American Scientist.

Vol. XII. No. 7.

December, 1901.

Whole No. 108. ✓

Established 1884.

THE WEST AMERICAN SCIENTIST.

Published monthly.

Price 10c a copy; \$1 a year; \$10 for life.

Charles Russell Orcutt, Editor.

Number 365 Twenty-first Street,
San Diego, California, U. S. A.

TOURMALINE.

The tourmaline is one of the most interesting of gems, yet but little known, especially under its true name, its diversity of color having enabled it to pass under a multitude of names.

Black and brown tourmaline are usually opaque, and hence have no value as gems. The transparent stones available for gems are found in Maine, Connecticut and California, and in Brazil, Russia and Ceylon. The colored varieties are known correctly under the following names:

ACHROITE (colorless tourmaline)—Of gem quality, has been discovered in San Diego county, California, associated with other lithia tourmalines.

BRAZILIAN EMERALD—The emblem of the Brazilian clergy, is not an emerald proper, but a green colored tourmaline. A few green tourmalines have been found in San Diego county, in the lithia mine at Pala, and in several other localities, some of them of the finest gem quality. One beautiful specimen showing a perfectly flat termination, is banded green at the end, then a band of achroite shading into rubellite where fractured. Another specimen is green at the center, with a thin outer crust of black.

INDICOLITE—Blue tourmalines are reported as occurring in San Diego county.

RUBELLITE—Beautiful radiations and masses of crystals of pink tourma-

line occur in the lepidolite at Pala. A few crystals of gem quality, resembling those from the Isle of Elbe have been found in the county. The largest crystals measure two inches in diameter.

SCHORL—Black tourmaline; quite common in San Diego county and in Baja California, disseminated through quartz or feldspar. Crystals six inches in diameter have been observed.

Dr. A. C. Hamlin published in 1873 a small book, 'The Tourmaline,' of 107 pages and 4 colored plates, devoted mainly to the beautiful crystals of this mineral as found in Maine. On page 62 he says:—

'It seems as though the light of heaven was required in the production of the gems, as it is for the marvellous and varied hues of the flowers of vegetation. Thus far, nearly all of our precious stones have been found on or near the surface of the earth; and it appears as though the contact of the air or a ray of sunlight was required to build up their forms and perfect lines. Down in the thousand mines along the slope of the Rocky Mountains the amethyst vanishes below the depth of 20 or 30 feet, while the same quartz crystallizes in its beautiful and definite but colorless forms in the depths of the deepest mines. The diamond and the sapphire belong to superficial terrains; and we find that the rule of shallow deposit relates to most of the gems. The topaz of Brazil, the beryl of Siberia, the chrysoptase of Silesia, the turquoise of Thibet, or the opals of Hungary, all occur near the surface of the earth, and are never found below a certain depth.'

Oliver Cummings Farrington, in *Birds and Nature* for September, 1901, says:—

'The crystals are usually in the form of long, slender prisms; They often have the peculiarity of being differently colored in different portions. Thus a crystal may be green at one end and red at the other, and in cross section may show a blue center, then a colorless zone, then one of red and then one of green. Some of the crystals from Paris, Me., change from white at one termination to emerald green, then light green, then pink, and finally colorless at the other termination. In some crystals again the red passes to blue, the blue to green and the green to black.

Tourmalines of different colors have been known in the mountains near San Diego, California, for many years. At Pala the red crystals in lepidolite have been known since 1876, but not until 1898 was this remarkable deposit of lithia mica of known value, when the writer brought it to the attention of great chemical houses. The beautiful radiations of red tourmaline crystals in the delicate lilac lepidolite are seldom of gem value, but are now to be found in nearly every mineral cabinet in the world.

At Mesa Grande, east of San Diego, one of the most remarkable deposits of tourmalines was brought to my notice in 1899. The locality had been known for nearly 20 years, but had previously failed to attract attention. In 1900 the mine produced hundreds of crystals from 1 to 2 inches in diameter, generally 3 or 4 inches or more long, of nearly every shade and tint of color that the world had yet known, except some shades of blue and yellow.

A vein of feldspathic minerals, mostly decomposed, and lying on a granite foundation, contained masses of coarse, purple lepidolite, angular fragments of crystal quartz, and amblygonite, spodumene, and other minerals. In this matrix were the beautiful vari-colored crystals of tourmalines, and loose in the soil composed of decomposed portions of the ledge, were many of the finest gems ever found.

C. R. ORCUTT.

HOUSE HOLD PESTS.

'The Silver Fish' belongs to the lowest order of insects—the Thysanura—is wingless, of very simple structure, worm-like, about 1-3 inch long, tapering from near the head to the extremity of its body, and often one of the most troublesome enemies of books, papers, card tables in museums, starched clothing, and more rarely stored food substances. The entire surface of the body is covered with very minute scales like those of a moth. The head carries 2 prominent antennae, and at the tip of the body are 3 long, bristle-shaped appendages, one pointing directly backward, the other 2 extending out at a considerable angle; 4 shorter appendages are near; 6 legs spring from the thorax, and, while not very long, they are powerful and enable the insect to run with great rapidity.

Heavily glazed paper is very attractive to this insect, while it often causes wall paper to scale off by its feeding on the starch paste. Pyrethrum furnishes the best means of control, wherever it can be applied. C. L. Marlatt describes and figures it in bulletin No. 4, new series, division of entomology, U. S. department of agriculture, from which the above notes are mainly taken. *Lepisma saccharina* L. is the common species of England, now practically cosmopolitan.

METALS AND ORES.

ANTIMONY—An ore carrying about 38 to 40 per cent of this metal, and from \$5 to \$30 per ton in gold, occurs near San Diego, and awaits development.

CAESIUM—A rare metal contained in minute quantities in lepidolite. It would prove useful if an available supply existed.

LITHIUM.—Amblygonite, lepidolite, spodumene, and triphylite are the principal ores of this rare metal, the lightest known.

QUICKSILVER.—Cinnabar is the principal ore.

RUBIDIUM—One of the rare metals, more precious than gold, occurs as a by-product of the lithia mines.

LOUIS AGASSIZ.

Part of an address by David S. Jordan.
Teacher's Institute San Diego county.

"I have known and loved as well as a small man can know and love a great one, the man of whom I am to try to give you a picture—probably the greatest man in the history of education in America.

"It was the idea of Agassiz that his pupils were the best pupils in the world, the spot he was occupying the best spot, and the present minute the very best minute in the universe. It is said in Cambridge that it was not necessary to button one's overcoat quite so tightly in passing the house of the genial Agassiz.

"The parentage and early history of this man you can read in the encyclopedia. His mother was possessed of a warm love of nature, and this was inherited by her son. As a boy he wrote to his father: 'I desire that it shall sometime be said that Lewis Agassiz was a good son, a good citizen, and the greatest naturalist of his time.' The greatest naturalist of his time he doubtless was not, for Darwin lived in his time, and in many ways he was greater; but certainly Agassiz was far greater than any who had preceded him. He attended the University of Munich, the greatest university of that time, because it had the best teachers. Many of the discoveries of that time were first reported from the room of Agassiz, which soon became the resort of both teachers and students, and which became known as the 'Little Academy.' The museum of the town still contains many mementoes of the ardent worker who turned every place which he frequented into a bee hive. This young man, while earning but a small salary, found time and means to investigate and give to the world many great truths of nature, never before suspected. One subject which especially interested him was the nature and movements of the glacier. With a few chosen companions, he went upon the great glacier, built a hut, and lived there for seventy days. At the end of which time he gave the world a mass of valuable information which could

never have been gathered but by such observation.

"At last, he went to Paris and lived in the Latin quarter. While there, he met Humboldt, who was about to make a tour in Liberia for scientific investigation. Agassiz wished to accompany him, but Humboldt chose a better-known man. About the same time, two young men, Tyndall and Huxley, applied for positions in the University of Toronto, and were refused, as they were not sufficiently well known.

"Agassiz, later, went to England, and thence to America. He came to America for two reasons, one to study the glacier formations; second, to see for himself the great republic, for he was the child of the little Swiss republic.

"Though offered one of the finest of European professorships, he decided to remain in America and become an American.

"He loved the breath of freedom which was in the air of America, and which he had found nowhere else.

"He took a professorship at Harvard college, and went to work. Soon there was a complaint that the college was growing unsymmetrical, and even Emerson suggested that a check-rein be placed upon the ardent young professor. Agassiz replied that instead of checking one branch, it would be better to spur on the other departments, and thus restore the symmetry.

"The work of this new man was entirely different from anything previously known. He went out and talked with fairness and was ready to learn from every one he met. He attended teachers' institutes, and gave the teachers grasshoppers to study. This was ridiculed by teachers and newspapers, but he stood firm, insisting that the only way to study natural history was by studying the thoughts of God in nature for themselves, and not from books or blackboards. No book was allowed to be used till all possible independent investigation had been made.

"In 1873 this great educator decided to hold a sort of educational camp-meeting for instruction of teachers in

natural history. For his class he selected thirty young men and twenty young women, an innovation which aroused an outburst of criticism at first, as it was not considered at all necessary for the young women to be so instructed.

"The meeting place was an island, or reef, of about forty acres in extent, containing a barn, an old shed, a flock of sheep, a willow tree and nothing else. The barn was used as kitchen and dining-room, the shed as laboratory, sleeping places were improvised, and there for three months, under this great teacher, that earnest band of young people studied the book of nature. That summer's work marked an era in education, and natural history has been taught ever since, on the new and scientific plan of personal investigation. The next December, the well-loved teacher died. His pupils buried him in Mount Auburn, and brought to mark his grave a boulder from the same great glacier where he had built his students' hut.

"The barn and the shed of the summer's camp were afterward burned, the captain of the boat which took the students there was drowned, and soon only memories remained of the scene of their work. But on that uninhabited island on the Atlantic coast, in the midst of the solitude of nature, was held the grandest school, under the grandest teacher, that the history of education in America has ever known."

TALKS ON MINERALS.

Teacher's Institute, San Diego county.

It was expected that L. M. Aubrey, state mineralogist, would be present to speak on the subject of "Mineralogy, and Why More Attention Should be Given to It in the Public Schools of the State. Mr. Aubrey was not able to be present, however, but he sent a letter which was read by Superintendent Davidson. In part of the letter Mr. Aubrey said: "California's mineral wealth is gradually increasing yearly, and as it is an industry that has proven its stability, and is one of the state's chief sources of wealth, I believe that a more general knowledge by pupils, concerning the var-

ious classes of minerals that are produced is necessary, and that they should have a better geographical idea of the localities where these minerals are found. To illustrate the extent of this industry in California, the mineral statistics collected by the state mining bureau for the year 1900 show that there were produced mineral substances of a valuation of \$32,622,945.

"There are also to be found many metals which exist in quantity, but which, owing to local conditions, cannot at this time be profitably mined, but which will unquestionably be treated successfully in the near future, as modern methods are advanced."

Mr. Aubrey advocated the teaching of mineralogy by having in the schools collections of the minerals and metals of the state, and particularly of the locality in which the school is situated. He promised the assistance of his department in making the collection if the trustees would see that they were put to use.

W. H. Holcomb spoke for some minutes on the subject of the minerals of this county.

SCHOOL GROUNDS.

R. C. Allen, at Teacher's Institute.

"In the matter of efficiency and general high character of our country schools I believe that our state makes a favorable comparison with any other in the union, and so far as that is true we have reason to be proud; but as, in a race, the leader, if followed by his contestants, cannot afford to lag, so we cannot afford to relax our efforts to keep our schools in the front rank. We must insist on more and more thorough preparation and well-rounded education on the part of our teachers. Through the generosity and good judgment of our state government we are enabled to pay our teachers higher salaries than rule for similar work in the older states, and therefore we are justified in expecting and requiring a full equivalent of service from them. I believe that as a rule we are getting interested and enthusiastic work from our teachers, but in this world perfection is rarely attained and improvement is nearly always possible.

"I am informed by our superintendent that in some districts he finds great laxity on the part of the clerks in the matter of filing their records. It sometimes occurs that all records are lost and this causes serious inconvenience to him, and also to the new clerk, where the fault has been that of a predecessor. In the superintendent's office at the court house, will be found boxes provided for this special purpose of filing away the records of each district, where they may be safe from loss or destruction. It is hoped that district clerks will make use of these filing cases."

THE QUEST OF HAPPINESS.

Part of an address by D. S. Jordan.

"I wish in this address to make a plea for sound and sober life. I base this plea on two facts: to be clean is to be strong; no one can secure happiness without earning it.

"Among the inalienable rights of man—as our fathers have taught us—are these three: "Life, liberty, and the pursuit of happiness." So long as alive and free, he will, in one way or another, seek that which gives him pleasure, hence life, liberty, and the pursuit of happiness are in essence the same. But the pursuit of happiness is an art in itself. To seek it is not necessarily to find it, and failure may destroy both liberty and life. Of some phases of this pursuit I wish to speak today. My message is an old one. If by good chance some part of it is true, this truth is as old as life itself. And if it be true, it is a message that needs to be repeated many times to each generation of men.

"It is one of the laws of life that each acquisition has its cost. No organism can exercise power without yielding up part of its substance. The physiological law of transfer of energy is the basis of human success and happiness. There is no action without expenditure of energy, and if energy be not expended, the power to generate it is lost."

"In every walk of life, strength comes from effort. It is the habit of self-denial which gives the advantage to men we call self-made. He has learned the value of money and of

time, and he has learned to resist the temptation to throw either away. He has learned to say "no" and to say it at the right time.

"If we would have the Puritan strength we must hold to the Puritan's hatred of evil. Our course of life must be as narrow as his; for the way that leads to power in life must ever be short and strong. It is still true, and will be true forever, that the broad roads and flowery paths lead to weakness and misery, not to happiness and strength. There is no real happiness that does not involve self-denial.

"In general, the sinner is not the man who sets out to be wicked. There are some such fiends by blood and birth, but you and I do not meet them very often. The sinner is the man who cannot say "no." For sin to become wickedness is a matter of slow transition. One virtue after another is yielded up as vice calls for sacrifice. The primal motive of most forms of sin is the desire to make a short cut to happiness. We yield to temptation because it promises pleasure without the effort of earning it. The promise is never kept. The unearned pleasures are mere illusions. They leave "a dark brown taste in the mouth"; their recollection is 'different in the morning.'

"But true happiness leaves no reaction. The mind is at rest within itself and the consciousness is filled with the joy of living."

Dr. Jordan classified the short cuts to happiness which temptation commonly offers into five classes:

Indolence—the attempt to secure the pleasure of rest without the effort that justifies rest and makes it welcome;

Gambling—the desire to get something for nothing. Burglary and larceny have the same motive. The difference is one fixed by social customs and prejudices—the thief may be a welcome member of society if he is the right kind of a thief.

Licentiousness—The search for the unearned pleasures of love, without love's duties or love's responsibilities. The way to unearned love lies through the valley of the shadow of death. The

path is white with dead men's bones. Just as honest love is the most powerful influence for good that can enter into a man's life, so is love's counterfeit the most disintegrating. Love is a sturdy plant of vigorous growth, with wondrous promise of flower and fruitage, but it will not spring from the ashes of lust.

Precocity—In the hot bed of modern society there is a tendency to precocious growth. Precocious virtue, as the Sunday school books used to describe it, is bad enough, but precocious vice is most monstrous. Precocious fruit is not good fruit. The first ripened apples have always a worm at the core. What is worth having must bide its time. To seize it before its time is to pluck it prematurely. The immature child is brought at once among temptations he cannot resist because he cannot understand them. Vulgarity has in some measure its foundation in precocity. It is an expression of arrested development in matters of good taste and good character.

Intemperance—The basis of intemperance is the effort to secure through drugs the feeling of happiness when happiness does not exist. Men destroy their nervous system for the tingling pleasures they feel as its structures are torn apart. There are many drugs which cause this pleasure, and in proportion to the delight they seem to give is the real mischief they work.

While all this is true, I do not wish to take an extreme position. I do not care to sit in judgment on the tired woman with her cup of tea, the workman with his pipe or his glass of beer. A glass of claret may sometimes help digestion by a trick on the glands of the stomach. A cup of coffee may give an apparent strength we greatly need. A good cigar may soothe the nerves. A bottle of cool beer on a hot day may be refreshing. A white lie oils the hinges of society. These things are the white lies of physiology.

"I makes no attack on the use of claret at dinner, or beer as medicine. This is a matter of taste, though not to my taste. Each of these drugs leaves a scar on the nerves; a small scar, if you please, and we cannot go through

the battle of life without many scars of one kind or another. Moderate drink-scar on the nerves; a small scar, if stays moderate. It is much like moderate lying—or, to use Beecher's words, words, "like beefsteak with incidental arsenic."

But the point of all I have to say is this: What is worth having comes at the cost which corresponds to its worth. If the end of life is to enjoy life, we must so live that enjoyment is possible to the end. All forms of subjective enjoyment are pleasures that begin and end with self, and are unrelated to external things, are insane and unwholesome, destructive to effectiveness in life and of rational enjoyment. And this is true of spurious emotions alike, whether the pious ecstasies of a half starved monk, the neurotic excesses of the sentimentalist, or the riots of a debauchee.

It is not for you to seek strength by hazard or chance. Power has its price, and its price is straight effort. It is not for you to seek pleasure and strength in drugs, whose only function is to deceive you, whose gifts of life are not so real as your own face in the glass. It is not for you to believe that idleness brings rest, or that unearned rest brings pleasure. You are young men and strong, young women in your full strength, and it is for you to resist corrosion, and to help stamp it out of civilized society. A man or woman ought to be stronger than anything that can happen to him. He is the strong man who can say "No." He is the wise man who, for all his life, can keep mind and soul and body clean.

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Yours respectfully, **O. D. PHELPS, M. D.**

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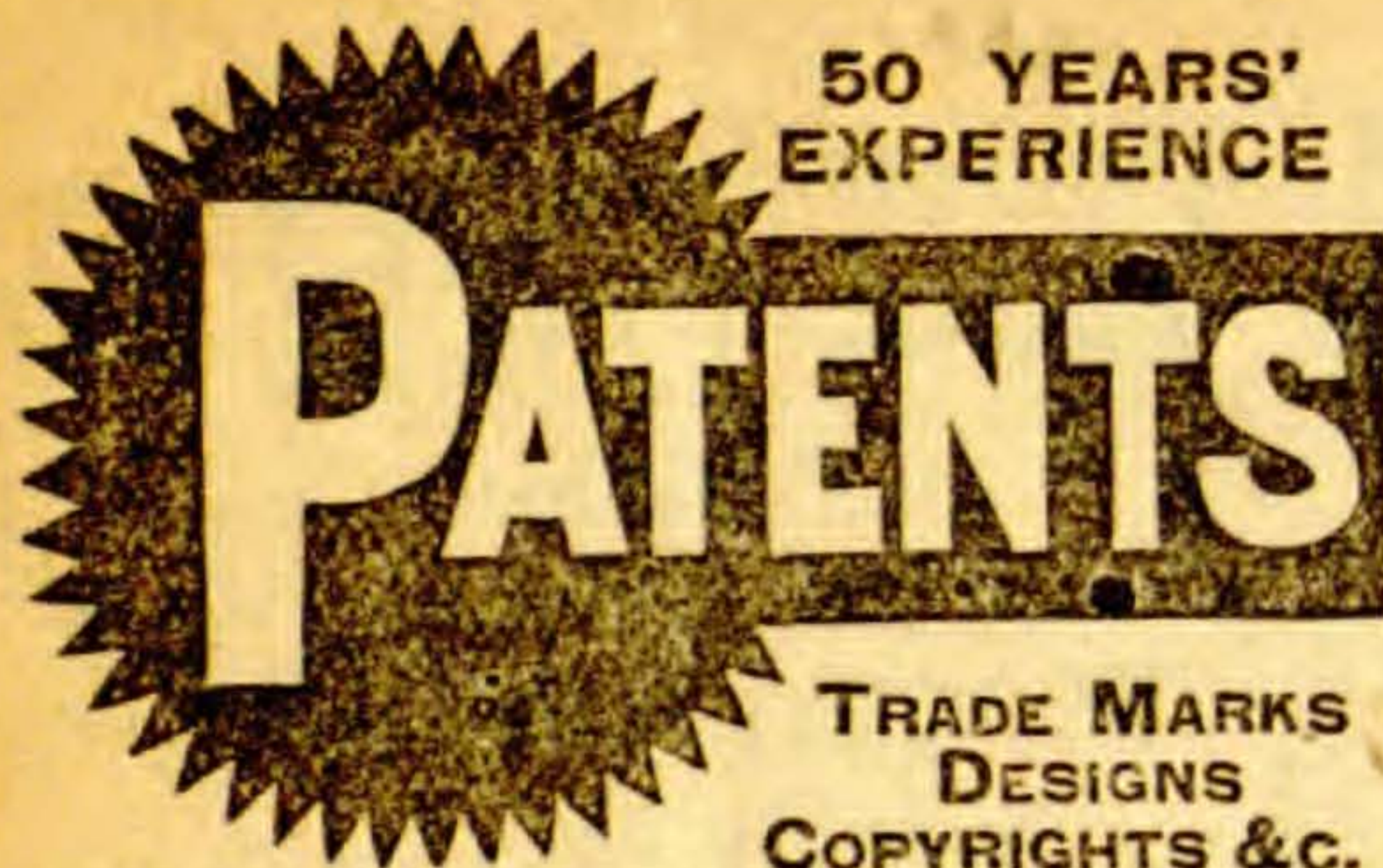
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SAN DIEGO SOCIETY OF NATURAL HISTORY.

On the first day of October, A. D. 1874, Dr. George W. Barnes, Charles Coleman, Jr., (principal of the public school), J. B. Wells (local observer of the U. S. Signal Service), Charles J. Fox, L. L. Roberts, W. F. Allen, O. N. Sanford, L. B. Wilson, George W. Marston, E. W. Hendrick and Daniel Cleveland, met at Mr. Cleveland's office in this city and effected the preliminary organization of the San Diego Society of Natural History. Of these eleven persons, the first four have died, the next four have removed from this county, while the last three of them still reside here. Articles of incorporation were filed October 14, 1874. On the 2d of November, 1874, the permanent organization was effected by the election of the following officers: President, Dr. George W. Barnes; vice-president, Daniel Cleveland; secretary, E. W. Hendrick, and treasurer, O. N. Sanford. Dr. Barnes held the office of president until his resignation was presented, because of falling health, about one year before his death, in February, 1890. He was succeeded by Daniel Cleveland, who has been president ever since, with the exception of the years 1892-3, when the Rev. B. F. McDaniel, now of Newton, Mass., was the incumbent.

The object of the society, as declared

in its constitution, is "the study of nature, the acquirement and diffusion of scientific knowledge, and the collection and preservation of materials pertaining thereto."

To this purpose the society has ever remained true, during the twenty-seven years of its existence, and it is believed that this association is the first scientific society organized in this state south of San Francisco. During its first year, meetings were held weekly, and were always well attended. Thereafter, the meetings, held once a month, were interesting and successful. About 1889, however, interest in the society seemed to abate somewhat, and for some years meetings were not regularly held. It is hoped that the time has now come when the regular meetings and work of the society can be successfully resumed.

In this brief article upon the society only a small portion of its work, and a few items of special interest connected with it, can be mentioned. At one of the first regular meetings of the society—Nov. 9, 1874—contributions of scientific material—biological and literary—began to flow in, and have continued, until the society has now amassed a considerable museum and library. Unfortunately, as the society possesses no building of its own, this material is packed away where it is not accessible. As early as July, 1875, the society, at the request of Gen. Myer, Chief Signal Officer, U. S. A., appointed a local meteorological committee to co-operate with him. Later in the year, this committee, aided by an appropriation of \$100, granted by the county board of supervisors, established at different

points in the interior of this county ten weather stations, equipped with all the necessary instruments, blanks and books for observing, reporting and recording meteorological conditions. Resident volunteer observers were secured for all the stations, who reported to the society, which, in turn, reported to the chief signal officer. Stations were thus established at Banner, Campo, El Cajon, Julian, Pine Valley, Poway, San Pasqual, Stonewall mine, in the Cuyamaca valley, and at Temecula, and were maintained—according to the good faith and perseverance of the observer—for periods ranging from one to ten years. The meteorological data thus obtained by the society is interesting and valuable.

In this connection, attention may be called to a few interesting "weather" items contained in the records of the society. On the 12th of March, 1876, J. S. Harbison reported to the society that "while certain curious clouds were visible, the atmosphere had qualities unfavorable to honey making. Dr. Barnes thought that northerly winds contained more electricity, and may have some effect in this way. Mr. Harbison stated further that while these 'curious clouds' were present horses seemed to be nervous. Doctors had observed at such time unusual nervousness in their patients." On Sept. 7, 1877, it was stated by the meteorological committee that "settlers regarded this season—1876-7—as the driest year they have known in San Diego county, as is indicated by the drying up of the lagoons, streams, springs, etc.; the limited rainfall of the season (amounting to only 3.63 inches), and the rapidity of exaporation caused by the unusual heat, and the drying (north) winds." Nov. 2, 1877, "C. J. Fox called attention to the unusually early precipitation of snow on the Cuyamaca mountains, which occurred October 29, 1877." Brilliant meteors were observed here Nov. 30, 1877. Dr. Barnes reported that in the fourteen months during which the sunset observations of the sky had been made at San Diego, 86 per cent of the forecasts of the anticipated weather for the succeeding twenty-four hours had been verified. Dec. 6, 1878, Dr. Barnes

reported upon the heat wave of September, 1878. March 3, 1897, Ford A. Carpenter, local weather observer, reported that "so far at least as the United States is concerned, San Diego has a unique record in the amount of sunshine in the winter months, and throughout the year—the amount of sunshine being relatively very great during the winter months—when it is needed—and small during the summer months, when it would be objectionable."

Oct. 11, 1879 the meteorological committee reported successful tests for ozone made at the San Diego and Campo weather stations for September, 1879.

The old bronze cannon, "El Jupiter," cast at Manila in 1798, was brought from Old San Diego in November, 1876, to celebrate the supposed election of Samuel J. Tilden to the presidency, over Gen. R. B. Hays. In December, 1880, some mischievous boys filled the gun with mud and fired it at night, hoping to make a great noise, in which they succeeded, bursting the cannon and almost killing one of the boys at the same time. The fragments of the gun were collected by Robert Bailey for his museum. On January 7, 1881, the citizens of "Old Town," who claimed to be the owners of the gun, donated it in writing to the society, and the board of city trustees confirmed this action. Mr. Bailey surrendered the gun to the society, which had the pieces put together. Jan. 17, 1882, the board of city trustees presented to the society, from the city archives, a letter written in 1850 by Capt. J. Hayden, U. S. A., to J. H. Bean, then alcalde of San Diego, relating to the history of this old cannon. May 13, 1898, "El Jupiter" was placed on exhibition at the chamber of commerce, where it now is.

May 7, 1880, a fine specimen of the California vulture (*Cathartes Californianus*), which had long been shot in the Cuyamaca mountains, was presented to the society. It measured ten (10) feet across the wings. Unfortunately, this very valuable skin was not preserved, as there was then no taxidermist at San Diego.

Jan. 17, 1882, Theodore L. Rogers, vice-

president of the California Southern Railway company, donated to the society the first passenger ticket issued by said company.

March 10, 1882, D. Cleveland exhibited a specimen of *Ophlogosum*, recently named *O. Californicum*—a new species—which was collected at San Diego in 1850 by Dr. C. C. Parry, then botanist of the Mexican Boundary Commission. The plant was lost, with others, in transmission to the east, and not seen again until it was rediscovered here, a few days before by Dr. Parry and Mr. Cleveland. Nov. 2, 1883, Mrs. Z. Cronyn reported that some tubers of the common potato (*Solanum tuberosum*) which had been collected by J. G. Lemmon, among the indigenous plants of the Chiricahua mountains of Arizona, were planted by her and had yielded a good crop of tubers of increased size. This is, perhaps, the first discovery of the potato as indigenous to North America. It is generally regarded as a South American plant, naturalized in North America and Europe.

Nov. 2, 1883, Mr. Cleveland presented a written communication upon *Pinus Torreyana*, growing in Soledad canyon. A committee was appointed to take measures to protect this rare tree. August 7, 1883, Joseph Surr reported that, at the request of this committee, the county board of supervisors, and the board of city trustees had each passed ordinances offering a reward of \$100 for the arrest and conviction of any person who should cut, destroy, or injure any of these trees. This action stopped the cutting down and sale of said trees for fire wood, which at one time threatened the destruction of the whole grove..

July 24, 1899, the common council of the city of San Diego, by ordinance, reserved the land—about 369 acres—upon which these trees are standing, as a public park, designating it as "Torrey Pine Park." The park contains about 2,700 trees, and is located about twenty miles north of the city center, though within the municipal limits.

Oct. 2, 1884, on motion of John G. Capron, it was resolved that the United States congress be petitioned to grant to this society sections 12, 13 and 14 on

San Miguel mountain for an astronomical observatory. The petition was sent, prominent senators and representatives became favorably interested in the project, and at one time it seemed as though the grant would be made.

In March, 1887, E. W. Morse and Mary C. Morse, his wife, donated to the society, lot I in block 18 of Horton's addition, upon which Unity hall now stands, under a lease from this society. The society pledged itself to erect a building upon the lot for the use of the society, as soon as practicable.

Aug. 26, 1887, Henry Hemphill donated a large collection of shells to the society.

In the winter of 1892-3 the chamber of commerce undertook the preparation of an exhibit of fishes, in alcohol—the property of this society—for the Columbian exposition at Chicago in 1893.

Dec. 10, 1897, E. W. Morse reported the successful grafting, at Alpine, in this county, of the eastern chestnut upon the common oak.

Many scientific papers have been presented, and many interesting lectures and addresses have been made to the society. Some of these have been of much more than local and transient interest and value. At present the society meets monthly at the house of some member. Papers are presented and addresses made upon some scientific subject (often one of special local interest), announced the previous month. The December, 1901, meeting was held at the residence of Miss Lena Polhamus, and the subject discussed was the marine life of San Diego waters.

The society begins the year 1902 out of debt, with a respectable cash balance in the treasury, and owns a valuable building lot centrally located, upon which, it is hoped, a building for the society will be erected in the near future.

The present officers of the society are: President, Daniel Cleveland; vice-president, Mrs. Harriet Phillips; secretary, Will H. Holcomb, and treasurer, Theodore Fintzelberg.

DANIEL CLEVELAND.

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The West American Scientist.

Vol. XII. No. 9.

February, 1902.

Whole No. 110.

THOMAS MEEHAN.

"Friend after friend departs,
Who hath not lost a friend?"

The State Botanist of Pennsylvania and senior editor of Meehan's Monthly of Germantown, passed to the "better land" Nov. 19, 1901, aged 75 years. He was born in London, England, March 21, 1826. He once wrote: "My earliest recollection is of butter-cups in a field of grass tossed into mimic waves by a summer breeze, at three years of age, West London, England."

His early home was the Isle of Wight. There being no schools there his mother taught him to read and write. The "Book of Common Prayer" was his primer, the Bible and Bunyan's Pilgrim's Progress his readers. After the family moved to Ryde he went to school two years. Eager for learning he improved every opportunity, and with his hard earned pocket money bought a Latin Dictionary and Grammar, Logic and some other books and studied nights in his father's greenhouse. And thus became so proficient that before he was 19 he was elected member of the Royal Wernerian Society of Edinburg, on account of his original contributions, one of them being a paper in which a knowledge of Latin was an essential requisite. He also studied Greek the same way, and became so familiar with French as to read it like English. This young man saw Victoria, the then young queen, more than once, while he was a student at Kew gardens. The young man went to America, and at the age of 22 entered Philadelphia, where for more than half a century he has been one

of the leading minds of the city, being 20 years on the school board and long a member of the city legislature and being the means of getting up 23 small parks for the benefit of the poor. He became respected and beloved by the large community. He was the friend of the genial Botanist, Dr. Asa Gray, and spoke of him as "one of the kindest of heart among my friends." Prof. Meehan has been for some years an efficient director of the Philadelphia Academy of Natural Science, the collections of which are the third best on this continent, to which he was a liberal contributor. The professor was often asked to write his biography, but said that at his age he would rather be making history than writing it. He was fond of music and said: "When I want a change from science I take my flute and play over some old church tunes. Indeed I sometimes think that when they bury me I would listen with pleasure to "Autumn" if they would sing it over my grave."

MRS. E. E. ORCUTT.

HOUSE HOLD PESTS.

'The Silver Fish' belongs to the lowest order of insects—the Thysanura—is wingless, of very simple structure, worm-like, about 1-3 inch long, tapering from near the head to the extremity of its body, and often one of the most troublesome enemies of books, papers, card tables in museums, starched clothing, and more rarely stored food substances. The entire surface of the body is covered with very minute scales like those of a moth. The head carries 2 prominent antennae, and at the tip of the body

are 3 long, bristle-shaped appendages, one pointing directly backward, the other 2 extending out at a considerable angle; 4 shorter appendages are near; 6 legs spring from the thorax, and, while not very long, they are powerful and enable the insect to run with great rapidity.

Heavily glazed paper is very attractive to this insect, while it often causes wall paper to scale off by its feeding on the starch paste. Pyrethrum furnishes the best means of control, wherever it can be applied. C. L. Marlatt describes and figures it in bulletin No. 4, new series, division of entomology, U. S. department of agriculture, from which the above notes are mainly taken. *Lepisma saccharina* L. is the common species of England, now practically cosmopolitan.

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The West American Scientist.

12, 423

Vol. XII. No. 10.

March, 1902.

Whole No. 111.

HUMMINGBIRDS.

Nearly 500 species and sub-species of hummingbirds are now known. These are divided among about 100 genera. They are found only in the American continent and its associated islands. Scarcely any part of this area, except the colder arctic and antarctic regions, is without one or more species of hummingbird during some part of the year. In the cooler parts of this area they are only summer residents, migrating toward the tropics as soon as the flowers cease blooming. Tropical species migrate but little or not at all.

The traveling flight, if it may be so called, of our species is undulating, somewhat like that of a woodpecker. The shorter, common flights are direct, with regular wing strokes. These direct flights sometimes attain an astonishing velocity, most hummingbirds being able to overtake almost any other bird they choose to pursue. They are peculiar among birds in being able to fly backwards, which they regularly do in backing out from any deep flower they may be feeding in. The flight is often erratic, and sudden pauses are frequently made, when the bird hovers as if suspended in air, the rapidly moving wings being seen only as flickering mist about the body.

Hummingbirds are nearly fearless, their extreme speed and dexterity in turning sharply enabling them to easily avoid any other bird, should it attempt to pursue them. They never alight on the ground, their short legs being unfitted for walking. They perch on twigs or small branches, usually on those situated sufficiently in the open to give a good view of passing insects, a

part of their food being caught in flight, flycatcher-like. A considerable part of their insect food is gleaned among the foliage of shrubby and trees. Another portion is taken in flowers with the nectar found there. Sometimes nectar forms the greater part of their food.

Hummingbirds are very active, their periods of rest being usually short, though frequent. Many species are pugnacious, but often the seeming quarrels are only frolics. Most species have favorite feeding grounds from which they are inclined to drive other birds. Though not able to injure other birds, their activity in attack is sufficiently annoying that most birds prefer to leave when thus requested to do so. The notes are quite varied in character and several species have a song, consisting of a low more or less musical warble.

The body colors of most females and of many males are some shade of green, often tinged with gold. The males of many species are ornamented with gorgets, ruffs, crests or peculiarly shaped tail feathers, these being often of exquisite metallic colors. As is the usual rule among birds, the females are commonly plainly colored.

The nesting habits of hummingbirds are similar in general character to those of other families of bush- or tree-nesting birds. The nests are commonly saddled on some small branch, and are cup-shaped, open on the top. They are warm, thick-walled, well made structures and from their small size and neat workmanship are dainty examples of bird homes. The eggs are two in number, pure white, oval in

shape and rather large for the size of the parent.

Four genera and at least eight species of hummingbirds are known to occur in California, or nine if the so-called Violet-throated Hummingbird is found to be a good species. The single known specimen was probably a hybrid.

The Rufous Hummingbird (*Selasphorus rufus*) is perhaps our most beautiful hummingbird. It has a very extended range, being found in summer as far north as Cook's Inlet in central Alaska and in winter as far south as the table lands of Mexico. It ranges from the Pacific Ocean east to Colorado and Montana. Its breeding range is from central California north to Alaska and east to the Rocky Mountains. The breeding season commences in April and extends to July. The nests are often placed in shrubs overhanging small streams or footpaths. The nests are usually well stuccoed.

Rufous Hummingbirds are best known in California as spring migrants. In March and April they are abundant in the valleys on their way north. The southward migrants in autumn pass principally through the higher mountain ranges, as flowers are most abundant there at that season. The male Rufous Hummingbirds are very pugnacious but the females are comparatively quiet and well behaved.

Rufous Hummingbirds are often confused with Allen's Hummingbirds (*S. allenii*), which occur with the former species in many localities in the migrations. The females of the two species are so similar that it takes a close examination by an expert to distinguish them. The males are similar in a general way, but the back of Allen's Hummingbird is green, while that of the Rufous Hummingbird is cinnamon-rufous, occasionally tinged with green.

The range of Allen's Hummingbird is not as wide as that of the Rufous. A few individuals winter in the Santa Barbara Islands and seem to be permanent residents there. The bulk of the species winter somewhere south of California, but where is not definitely known, from lack of accurate observations. Its summer range is from west central California northward probably throughout the Cascade Mountains,

seemingly being most abundant not far north of San Francisco, perhaps because more good observers have studied them there.

Allen's Hummingbird is said to be the most quarrelsome of the North American species. Its nesting habits are similar to those of the Rufous Hummingbird.

Joseph Grinnell found a nest containing two eggs March 28th, on Santa Catalina Island.

Anna's Hummingbird (*Calypte anna*) is the commonest and best known species in California. It ranges over most of California and northern Lower California, sometimes migrating into Arizona in autumn. In the coast valleys of central and southern California, Anna's Hummingbirds are resident as a species though most abundant in winter. Their breeding season is long, January to July, one set having even been found in December near Los Angeles. Nests are placed in all sorts of places, at heights varying from two to forty feet from the ground. The greater number of those seen were placed in ornamental trees. The nests are composed of various sorts of materials and are usually stuccoed on the outside with bits of lichens and moss. They are rather large and thick walled. The females are close sitters though surpassed in this respect by Costa's Hummingbirds.

It is probable that those individuals that breed, or are reared in the coast valleys in winter and early spring, migrate to the pine regions of the mountains, being replaced by immigrants from the southern parts of the winter range of the species.

The remaining species of Hummingbirds found in California are:—Black-chinned Hummingbird (*Trochilus alexandri*), a rather common resident of the southwestern United States.

Costa's Hummingbird (*Calypte costae*), ranging over much the same region as the Black-chinned but not as common and found in more arid localities.

Flores's Hummingbird (*Selasphorus floresi*), a very rare species, two males have been taken near San Francisco, California.

Broad-tailed Hummingbird (*Selas-*

phorus platycercus), a common Rocky Mountain species, occurring in summer in the higher Sierra Nevada Mountains in limited numbers.

Calliope Hummingbirds (Stellula calliope), a moderately common summer resident of the mountains of western North America, breeding from the San Bernardino Mountains of Southern California northward to British Columbia.

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Vol. XII. No. 11.

April, 1902.

Whole No. 112

- COLLECTED DESCRIPTIONS OF
CACTI.
- CEREUS 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 3:01.
- 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. Zapatlan, Jalisco."—Coulter, Cont Na hb 3:409.
- 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 2-5 m 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 reflexed; flowers lateral, white, 1-1.5 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.
- Cereus Eayacabitis**
Variety **NEO MEXICANUS** Coulter.
"Different 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 PECTINATUS**
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 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 confluent 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 3:39.
- 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 HOLLIANUS** Weber.
"Branching 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 hedg- es and vineyards."—Coulter, Cont Na hb 3:411.

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 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 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 on upper pulvini with some smaller additional ones, 1-3 on lower pulvini), erect or spreading, or the upper ones (from upper part of pulvinus) mostly deflexed. Type, Palmer of 1877 in hb Mo bot gard. Near St. George, Utah."—Coulter, Cont Na hb 3:423.

OPUNTIA RUBRIFOLIA Engelm.

"P. o. s. rate, 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

twisted, 2.5-6 cm long, often a few additional smaller ones, all deflexed (almost appressed); leaves and fruit unknown. Type, Palmer in hb Mo bot gard. St. George, Utah."—Coulter, Cont Na hb 3:424.

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The West American Scientist

Vol. XII. No. 12.

May, 1902.

Whole No. 113

CACTUS NOTES.

MAMILLIARIA THORNERI Orcutt.

Cylindrical, $1\frac{1}{4}$ 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. 2583.—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.

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, 1-2 $\frac{1}{2}$ 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, $\frac{1}{4}$ inch broad or less, varying from 1 to 6 inches in length sometimes on the same plant, uniformly about $\frac{1}{2}$ 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.

MAMILLIARIA 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. 2602:—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.

CEREUS STRIATUS Brandege.

Cereus digueti Weber, *Mu d'hist nat.*, 1865, 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.

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 ashy, 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.

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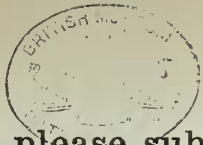
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The West American Scientist

Vol. XII. No. 13.

June, 1902.

Whole No. 114

INTO MEXICO WITH THE EDITOR.



Gleanings from private letters of the editor-in-chief who is three thousand miles away, will assist us in a brief trip into Mexico. There are many things of interest to be noticed on our way. Perhaps first of note to the speed-loving American is the time the trip requires. Eight years ago, from El Paso to Mexico City, required four days. Now we can accomplish the same in little more than half that time—two and one-half days.

Outside our car window as we leave El Paso, we see only grassy plains and sand hills. Mesquite trees are in leaf and form the chief verdure of the country. The Living Rock cactus is found on the hills in this vicinity, but very difficult to distinguish as it is so identical in color with the rocks on which it grows. Agaves abound in the mountains, one of these, a bulbous variety, is especially beautiful.

Further south we pass fields of young cotton plants. Yuccas are used for fence posts. Everything is dry—a desert. In some parts of the trip the mes-

quite trees give promise of being in reality what they are in name—trees.

As we reach the valley of Mexico we find ourselves in a region of broad cultivated fields, dry, much like California in aspect. The train winds around low hills, up, up. A reservoir of water with green fields of corn beneath its influence, and thousands of acres of maguey fields—a curse to Mexico; stone walls, tiled roofs, cathedral towns, the wooden plow, thirteen modern houses (huts of cast-off corrugated iron), big hats on barefooted and on sandaled men, a eucalyptus tree among the cacti; such are some of the sights as the landscape speeds behind.

Mexico City is reached at last. It has grown remarkably since a visit eight years ago and is destined to be larger still. No vacant lots in the city. Solid stone and other evidences of great wealth displayed—and of great poverty, as well. 500,000 people are living here, it is said. They are people of all sorts.

The free music and plaza promenade in one of the nearby towns brings them all out in their best. Among them some are very pretty, white, barehead-

ed girls in black lace mantillas over pink dresses, others wear Parisian hats and shoes, and the children are as pretty and as prettily dressed as the average in the United States.

But this trip into Mexico is far more comfortable than the real thing can be. In that are many trials to be met and conquered or endured. There is the dust. It is very trying at this season of the year, just before the rains set in. One night the train encountered a sand storm and in the morning the beds were covered with dust and the car was full of it. Not less trying than the dust is the heat. Activity of any sort must be suspended and the time of the greatest heat spent in the shade of trees and houses or within doors. Our Scientist, in a fit of absent-mindedness, one day, laid two plants and a snail in the sun, while with true scientific zeal he went for something else. When he returned he found them literally baked.

The condition of the people of Mexico is pitiful. Many of them are both poor and extremely ignorant. One Indian brought his little boy one evening, as bright a child as need be found, and the pride of his father's heart. A box with a dime in it was given to him. He shook the box as he went and was as happy in the music of that coin as if the home he was going to was a palace instead of a hut of mud and brush. What a future is before him! His father had worked all day for about thirty cents. He spoke in poor Spanish, had evidently never heard of the postoffice. He was looking wistfully toward the United States, but with neither energy nor knowledge will probably never reach it. It is pathetic to see the burdens these men will carry, a hundred pounds a mile at a time. And still more pathetic is their patience and their plaintive voices which are reminders of the middle ages.

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Vol. XII. No. 14.

July, 1902.

Whole No. 115

CACTUS NOTES.

The following have been described by Coulter under the generic name *Cactus*—those which prove to be valid species we will name as *Mammillarias*, but will not yet make the transfer, as some are known to be synonyms only of old species:

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 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 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.

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 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 brownish (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: radia

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, 2 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. Wegner, *M. densispina*, and *M. fuscata*, are probably all identical with this species.

RAMIREZ, JOSE:

—et Gabriel V. Alcoer: *Sinonimia vulgar y cientifica de las plantas mexicanas*. Mexico, 1902. 160 p. From the author.

Dr. Ramirez records the following common names of cacti:

Peyote—*Anhalonium fissuratum*, *lewinii* et *williamsii*.

Peyotl—*Anhalonium fissuratum*, *lewinii* et *williamsii*.

Hikori—*Anhalonium lewinii* et *williamsii*.

Ho—*Anhalonium lewinii* et *williamsii*.

Wakowi—*Anhalonium lewinii* et *williamsii*.

Organo—*Cereus marginatus*.

Cabeza de viejo—*Cereus senilis*.

Junco espinoso—*Cereus serpentinus*.

Xoalactl—*Cereus speciosissimus*.

Xnuntutzuy—*Cereus tetragonus*.

Biznaga de chilitos—*Echinocactus cornigerus*.

Junco—*Mammillaria coronaria*.

Biznaga—*Mammillaria pusilla* et *sphaerica*.

Jarana de pitahayita—*Phyllocactus angulifer*.

Pitayita de agua—*Phyllocactus latifrons*.

Marta—*Phyllocactus phyllanthoides*.

Nopalxochicueztatic—*Phyllocactus phyllanthoides*.

Abrojo—*Opuntia tunicata*.

Culhua—*Opuntia vulgaris*.

Nopal real—*Opuntia microdasys*.

Patilon—*Pereskia calandrinialifolia*.

Pititache—*Pereskia calandrinialifolia*.

Reina de la noche—*Phyllocactus latifrons*.

Para—*Opuntia tuna*.

Parl—*Opuntia tuna* et *vulgaris*.

Nopal—*Opuntia engelmannii*.

Tuna—*Opuntia ficus indicus*.

Nocheznopalli—*Opuntia hernandezii*.

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
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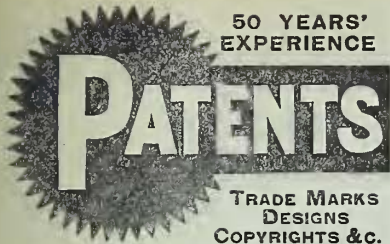
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