C. R. ORCUTT, Editor and Publisher,
San Diego, California, U. S. A.
Published monthly at No. 365 21st. St.
Price, 10 cents a copy; $1.00 a year.

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 Acmæa scabra, Chlorostoma funebrale, Littorina planaxis, Lottia gigantea, Monoceros lugubre and Pallochiton lanuginosa.

Pupa Sterkiana Pilsbry, Proceedings of the academy of natural sciences of Philacelphia, 1889, 412, apparently as yet collected only by the writer, near San Quintin bay, occurs abundantly on Roccella 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 Pilsbry has proposed the (still unpublished?)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.

Preliminery 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. Engelmann'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 cereï we find maritimus and flaviflorus; gabbii cochal and geometrizans; calvus and polyacanthus; gummosus and flexuosus, etc. Where 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. Furth, 131 Lexington avenue, N. Y. The prominent feature of the work is the elaboration and simplification of graphic formulae, by which the character and relations 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 promonent in business 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 estomated, 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. 17 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 American 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.

Advertisements.

50 cents per line each insertion.

West American Scientist.

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

Descriptive List of New and Novel Californian Bulbs.

CARL PURDY.

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

B. IXIOIDES 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 a green less 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 give the purchaser such a variety as he never dreamed possible.

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.

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 Kreluge's colored plates. It is in leaf and habit exactly like the creamy type, but its color a pure white with a slight greenish taste 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. FLURIFLORA. 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 hardy 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.

COTEMPORARY JOURNALS.

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

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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, Reverand John D. Parker, G. W. Dunn, Ellwood P. Cubberly, Dr. F. Baker, Miss Lena Polhamus and Miss Minnie Reed were elected to membership; Proffessor Arthur M. Edwards, 11 Washington street, New Jersey, was elected a corresponding member. Officers elected for the ensuing year:—D. Cleveland, president; Mrs. H. 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. S. A. 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 8c. 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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WANTED IN EXCHANGE!

By C. R. ORCUTT, San Diego, Calif.—

Baltimore cactus journal, i, 1.

California academy of sciences, memoirs, i; ii, 3, 5; bulletins 1, 2, 4, 5; 2nd ser. proceedings, ii; all of 1st series.

By H. FRUHSTORFER, Thurm-Strasse 37, Berlin N. W., Germany:—

Old American stamps or postal cards for illustrated price list of tropical butterflies.

North American Papilionidæ, Pieridæ, Parnassus and Lycaenidæ for Papilionidæ from Java, nice and showy.

Sells butterflies, beetles, and other insects in perfect condition, carefully named, cheaply.

Back numbers wanted:—1, 1–120–32, 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.

Books and magazines wanted by the editor; offer seeds, cacti, bulbs, shells &c

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Lot 40x70 ft., corner 13th and E, with a 5-room house, cheap. 365 21st st.

West American Scientist.

No. 83.

January. 1899.

CALOCHORTUS—continued.

Benthamii: open cup-shaped flowers...	2 25
luvus (Cyclobothra flava): golden shell	2 00
flexuosus: lilac fls, a fine butterfly tulip	10 00
Greenei: lilac, barred with yellow.....	10.00
Gunnisoni: light lilac, purple banding..	10 00
Howellii: true, light yellow.....	10.00
Kennedyi: magnificent dazzling scarlet	10 00
Leichtlinii: much like Nuttallii.....	3 00
lilacinus: lilac shading to purple, fine..	1 50
longibarbatus: fine purple, a foot high.	6 00
luteus: yellow fls, dotted with brown..	1 50
v. concolor: large bright yellow flowers	7 50
macrocarpus: large purple flowers.....	4 50
maweanus: white, silky blue hairs, fine	1 50
v. major, Hort. Twice the size of type	2.25
v. roseus, Hort. Pale rose tinged.....	2.25
nitidus: purple and green fls, flexuous.	7 50
nudus: dwarfish in habit, purple fls....	4 50
Nuttallii: large white fls, green banded	4 50
Palmeri: a rare and beautiful sort.....	7 50
Pammerae (Weedii purpurascens)	7 50
pulchellus: star tulip, pendant flowers.	1 50
Purdyi Greene: pale lilac fls, new.....	4 50
splendens: lavender color	3 00
v. atrovioiacea: purple, with red spots.	3 00
v. virtea, Hort. "Deep reddish purple"	3.00
Tolmiei: very large white pendant fls..	2 25
venustus citrinus: lemon yellow	1 50
venustus oculatus: finely marked fls...	1 50
venustus purpurascens: purple centers	2 25
[illegible] purpureus, Hort. Clear yellow	10.00
[illegible] sanguineus, Hort. Deep red..	10.00
[illegible] pictus, Hort.....	2.25
[illegible] vesta: White, suffused with [illegible]	4.50
[illegible] roseus: creamy inside	2 40
[illegible] orange butterfly tulip, fine ...	4 50
[illegible] alba: pure white.....	10 00
[illegible] varieties, choice selections.....	1 20
[illegible] "alba"	12 50
[illegible] purple giant, great novelty ...	25 00
[illegible] dark blue fls, edible bulbs...	90
[illegible]	7 50
[illegible] angustifolium, dwarf size..	4 50
[illegible] and pomeridianum, each...	4 50
[illegible] grandiflorum (giganteum)..	1 50
[illegible] minor, yellow flowers....	6 00
[illegible] large yellow fls, beautiful..	2 25
[illegible] pink fls, center blackish..	4 50
[illegible] white turning pink, Oregon..	6 00
[illegible] glowing pink, orange center	6.00
[illegible] 3 to 4 large pure white fls..	4 50
[illegible] rare and beautiful.....	4 50
[illegible] white fls turning purple.....	3 00
[illegible] alba: seed $3 per lb.....	60
[illegible]	4 50
[illegible] chocolate lily, white, purple fls	3 00
[illegible] much like recurva, pretty fls	6 00
[illegible] curious mottled coloring....	2 00
[illegible] nearly black, pretty.....	4 50
[illegible] white, otherwise like biflora..	3 00
[illegible]	4 50
[illegible] clear reddish purple.....	2.50
[illegible] charming yellow or orange fls.	4 50
[illegible] scarlet bell-shaped flowers....	2 00
[illegible] undulata, desert lily	50 00
[illegible] montanum, delicate white..	6 00
[illegible] Oregon, quite rare, ref	00 00
[illegible] like dwarf Humboldtii..	7 50
[illegible] orange, with black spots..	10 00
[illegible] bright red flowers	15 00
[illegible] red and orange	4 50
[illegible] yellow, spotted fls.....	7 50
[illegible] glorious fiery red	25 00
[illegible] delicate lemon yellow, fragrant	10 00

Lilium—continued:—

parvum, scarlet spotted with brown....	12 50
rubescens, opens white, very fine	20 00
Washingtonianum, white, very fragrant	12 50
Washingtonianum purpureum	10.00
Milla biflora, Cav. A popular Mexican.....	2.00
Muilla maritima, small whitish flower...	3 00
Richardia Africana, calla	4 00
SCILLA HYACINTHOIDES Linn.	
Strophollrion Californicum, Torrey.....	4.50
Trillium sessile californicum	3 00
ovatum, white, turning to wine purple.	3 00
Zygadenus Fremontii, creamy white fls..	4 50
paniculatus, stouter and taller	4 50

CACTI.

☞ We have many thousands in stock, including the Lyon & Cobbe collections and offer large series suited to the needs of public parks, botanic gardens, or private fanciers; dealers supplied; write us what and how many are wanted, and we will quote close prices; exchanges made for books, etc., or will sell business.

ANHALONIUM ENGELMANNI Lem. A remarkable, spineless cactus, aptly called the 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.

Anhalonium Engelmanni—see fissuratum.	
fissuratum—Living Rock.....	$ 15
furfuraceum Watson, a few only in stock	60
Lewinl.....	16
prismaticum	15
sulcatum	30
williamsii.....	15
Astrophytum myriostigma	25
Cactus deweyanus	1 0

CEREUS 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.

CEREUS EMORYI Engelmann. 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 downy; the flowers are yellowish, followed by a small edible fruit.

CEREUS ENGELMANNI Parry. Heads several (sometimes, though rarely, a hundred) 4 to 12 inches high, cylindric or ovate, with 11 to 12 ribs bearing bunches of about 12 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, 2 to 3 inches across, followed by spherical fruit, with much the same flavor of a strawberry

West American Scientist

Volume XI. January 1899. Whole No. 83.

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

[Parts 1 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 [illegible] fidus, laciniis subimbricatis, superne expansis, infernè coalitis i[illegible] nudum cylindricum; interioribus petaliformibus. Stigma s[illegible] dum radiatum. Suffrutices rotundati carnosi absque axe ligneo. [illegible] centes aphylli, mammillis crebre tecti spiniferis; spinis [illegible] stellam ad apicem singulæ mammillæ. Flores inter bases ma[illegible] rum. Fructus bacca parva polysperma edulis coccinea, fere o[illegible] acidula. Semina rotundata parva pallide carne pulposa nitulan[illegible]" — H. Haworth, "Synopsis plantarum succulentarum, cum desc[illegible] synonymis, locis; observationibus anglicanis, culturaque," 177.

"Sepals and petals united beyond the naked ovary into a short t[illegible] juicy, oval or club-shaped. Seeds brown or black; embr[illegible] without [illegible] plants, simple or branched, covered with spine-bearing tub[illegible] ers rising from the axils of the primary usually small [illegible] long, opening on [illegible] side." — George Engelmann, in Rothrock, "Wheeler Report," v. VI5. 1871.

MAMILLARIA: Prince Jos. de Salm-Dyck, "Cacteæ in Hort[illegible] te anno 1830," edition 2 (1850), says in a foot-note on [illegible] generum Mamillaria scripsimus, quia non a ver[illegible] dimutatum. Mamillaria Lemaire" [illegible] other botanists [illegible] Salm; the auth[illegible] us, Kew, England, and [illegible] spelling.

CACTUS Linnæus Syst. I. 1735, [illegible] in part: Otto Kuntze, Rev. Gen. Pl. 1891, Chapter. Contributions National Herbarium, III. 5, 1894.

The name Cactus, as applied to cactaceous plants, has been first used by Linnæus, in 1737, as [illegible] I take the following from a reprint of that work, published in 1890:—"Cuphorbium, L. [illegible] Cactus. Opuntia. Tournef. Euphorbium, [illegible] Cactus. Melocactus. Tourn."

The attempt to discard the name Mammillaria and restore Cactus seems to the writer ill-advised: 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 Engelmann, 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 3½°; which are composed of 100–200 different heads or stems. Single heads conical, apparently 4 or 5′ high, and 2½–3′ 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 Engelmann, 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, angulo 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 staminа brevia pauca flavida longe excedantibus flavis; baccis elongato-clavatis; seminibus subgloboso-ovatis scrobiculatis rugulosis parvis.—Rocky plains on the Pierdenales; flowers (in St. Louis) in May. Flowers forming a circle or wreath, in the larger specimens, of 1–1½′ 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 2½–6″ long, whitish; the four lowest or lower are stouter and very light brown; the central spines erect, or rather [illegible] or 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 [illegible] to 12″ long, unopened when not fully expanded in bright sunshine. Berry [illegible]–15″ long."—Engelmann, l. c.

M. Heidiæ Muhlenpf. v. applanata Engelmann, Proc. Am. Acad. iii. 503, 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. Arizonica, 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.

"Corypanthe 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 10–12, linear-subulate, fimbriate; petals 20–25, linear, curved; stigmas 8–10, white, berry oval, green, with few scales, 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. 214. 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-20; interioribus paulo robustioribus fulvis 10–15, centrali singulo robusto, uncinato, fusco, erecto; lanceis oblongis, variegatis, apice floris rudimenta 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, Wisliz. R. 100. 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. BRNECKEI Ehrenberg.

"Stamm cylindrisch, meistentheils aber schief abgestumpft, nabelformig eingedruckt, einzeln und aussprossend; Achseln anfangs wollig; Warzen dunkelgrun, hellgrun, gelbgrun, auch grun, gelb und roth, saulenformig, unten 4 seitig, oben schief abgestumpft; Scheibe anfangs meistens kurzwollig; Stacheln zweierlei: Aeussere 12–15, horizontal anliegend, von fast gleicher Lange, 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 langer, nach der Spitze zu sich verdicken und hackerformig gekrummt sind. Stamm 2–3 Z. hoch, 2–2½ Z. Durchmesser. Warzen 4–6 Lin. lang, 1½–2 Lin. dick. Aeussere Stacheln 3–4 Lin. lang. Mittlere Stacheln 3–6 Lin. lang. Mexico. Hrn. Etienne Berecke in Mexico zu Ehren."—Carl Ehrenberg, Botanische Zeitung, ii. 833. 1844.

Ehrenberg, AGZ. 1844. 401 (reprinted).

Walp. Rep. v. —.

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

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

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

Original description not seen.

"Depressa, ovata, s. cylindracea, prolifera; axillis lanatis; tuberculis parvulis conicis: aculeis extetioribus 16–20 tennissimis 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. 404.

M. CALCARATA Engelmann.

Original description:—"M. sulcata, n. sp.: cæspitosa; tuberculis ovato-oblongis sulco salinde apicem versus prolifero superne exaratis apice spiniferis; spinis rectis radiantibus cinereis e tomento albido deciduo (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 erosis cuspidatis sordide flavis ad basin intus filamentisque brevibus rubicundis; stylo supra stamina exserto; stigmatibus 7–10 flavis; baccis oblongis virescentibus.—With [M. similis, &c.]. Flowers opening for 2 or 3 days, in direct sunshine, 2′ or more in diameter. On account of the central flowers, this should form, with M vivipara, a distinct section. From that species it abundantly differs, not only in the color of the flower and the spines, but in the entire and smooth sepals, denticulate petals, etc."—Engelmann, Boston Jour. Nat. Hist. v. 246. 1845.

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

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

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

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

Labouret, Monogr. Cact. 142.

Walpers Ann. v. 37.

Watson, Bibliographical Index, 402.

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

Mamillaria strobuliformis Mhlpfdt. AGZ. 1848, 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 1 robustiore griseo-fusco."—Texas, Roemer

Mhlpfdt. Bot. Zeit. vi. 597.

Scheele, Roem. Texas, 135. 1849.

Not strobiliformis Scheer, nor Engelmann.

M. COMPACTA Engelmann.

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 1¾″ 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. crebrispinae. 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 Lubouret, Monogr. Cact. 146 = macromeris.

M. DECLIVES 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.

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

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

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

NAUTILUS, the: xii. 1–7, My–N 1898.

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

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

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

AMERICAN Mo. REV. of REVIEWS:

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

EDITORIAL.

Several months devoted to mining, 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. 1849.

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?

TETRACOCCUS 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 ASELLIFORMIS Ehrenb.

BOOKS.

FOR SALE —
BOOKS AND MAGAZINES.
ORCUTT, San Diego, California.

Agricultural, Stockraising and Mineral Resources of Colo., Utah, Washington, Kas., Oregon, Nebr., Wyo., Idaho and Montana, ill., about 100 pp. each, all for ..... .50

Annual of scientific discovery, 1853-7-8, '64-6a7-8-9, each 2 00

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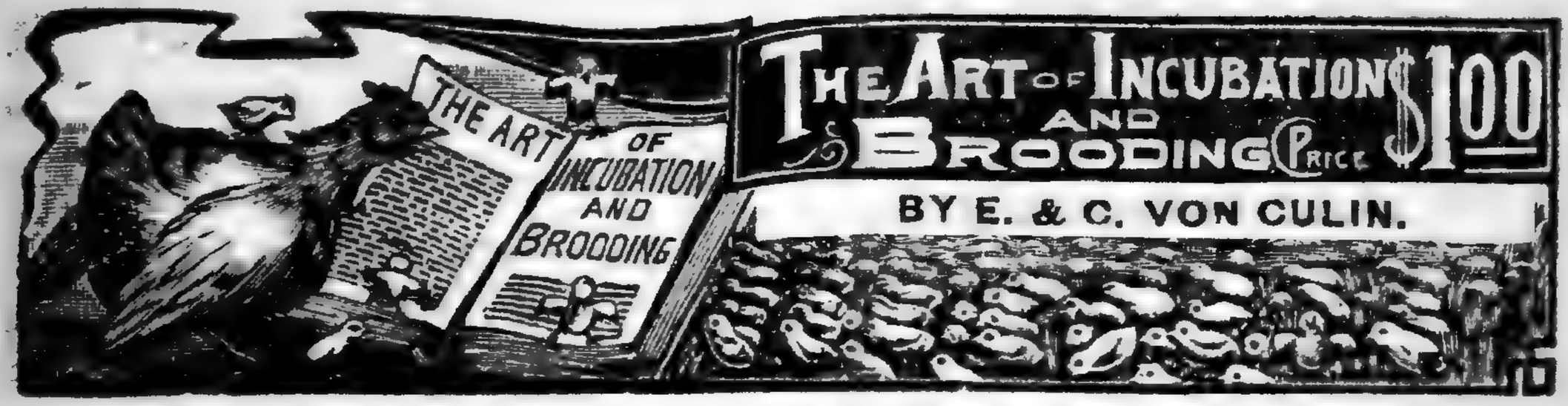

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West American Scientist

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—Vendémiare, Brumaire, Frimaire, Nivose, Pluviose, Ventose, Germinal, Floréal, Prasial, 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 circumferance of a "circle." That learned astronomer further affirmed that the action of the French savants, was in this particular:—"not a blun-"der 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 larter, 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

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*Our Inheritance in the Great Pyramid, by Piazzi 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 wor- "ship 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 Herschell 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 per- "fect system of linear measure, and rescue our weights and meas- "ures 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 thousanth louger than the British yard, so that the United States inch would be longer than the British inch by one-hun lred thousanth 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 Umted 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 case with

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*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 necesitate 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 kylometre, 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.

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*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 1076.43 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 kylolitre or 1000 litres that we have the cubic form again. The kylolitre is the cubic metre and is also called the stere. 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 thousanth 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 vacuuo,* 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, prabably 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

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

is almost impossible to transform all the existing standards into fractions of the metre and its derivitives. 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	Ostraea lurida Cpr.	1
2	Tellina Gouldii Hanl,	1 valve.
3	Mactra———?	"
4	Liocardium elatum Sby?	Fragment.
5	Chione simillima Sby.	9 valves.
6	Lucina nuttallii Conr.	12 "
7	Janira———?	5 Fragments.
8	Pecten———?	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 "Majesti crinus."

10 Teliformis.

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

11 Ammonite.

12 Strocotimus.

13 Platicrinus.

14 Pentremite. 5

15 Crinoids. 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. R. Lighton, collector, 1887.

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

19 Cerithium pillingi C. A. White. 142
20 " totium-sanctorum C. A. White. 22
21 Nerita californiensis C. A. White. 12
22 Trochus (Oxystele) euryostomus C. A. White, 24
23 Baculite Cheyenne river, from L. W. Stilwell. 1
24 Pentremite elongata. [This and the next with 9–15.] 1
25 Crinoid stems. 9
26 —— ——
St. Louis group, subcarboniferous, Madison Co., Ill. 7
27 Archimedes——— Keokuk group, last locality. 2
28 Crinoid stems, Ill. 11
29 Discina nitida. 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 Turritella——— 4
32 Chione fluctifraga Sby. 1
33 ——— simillima Sby. 2
34 ——— succincta 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 Anomia lampe Gray, 1 valve.
36 Chione—— 2
37 Ostrea lurida 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 thoughout 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. 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.

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 crystalizing in prismatic forms. Colorado deesrt.

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 enarly 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.

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. Rhombohedial in crystalization. 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. Thinolite, occuring 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 higly 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 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 dollers.

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 Majave 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 metalic surfaces, and then baked, becomes quite hard. This varnish mixed with half a pint of oil,

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.

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 deposite 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, penetratung 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: "Superintent 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—Feldsper 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 natrium." Has been reported as occurring in Southern California.

PLATINUM—This metal is found only in metalic condition, sometimes alloyed with iridium or osmium. A nugget weighing nearly two pounds (only 2¾x3 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

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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[afin.]." 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. Sargent 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 Californin. The following species were collected by C. R. Orcutt near the 28th degree, and identified by C. R. 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, 1890.

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 tierra 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 crystaline 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), the 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 paralle 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 archaean.

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, gabro and diabosa, 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 orieferous 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 formations 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 quartenary 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 synchinal 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
2 Quartz crystal, same locality, 1 $2
3 Gold ore, Owen's mine, Julian, Cal. Received from S. N. Wilcox. 1
4 Garnets, picked up by Indians at Ft. Defiance, New Mexico, in 1870. From Mrs. Annie E. Case, Ap. 1, 1889. 595 specimens.
5 Peridot, same locality. 4
6 Rock crystal, same locality. 11
7 Pyroxine variety, same locality. 6
8 Limestone, Washington county Ind. From Miss Adelaid Reid. 3
9 Opals, Queretero, Mexico. 2 $1
10 Iron nodules, abundant on the surface of the ground on the mesa at Del Mar, Cal., back of the town. 11
11 Gold ore, Calmalli, Baja Cal. 2
12 Quartz ("gold and silver ore), Pacific mining district, Colorado desert. 12
13 Gold and silver ores, same district, Golden Rule mine. 20
14 Precious opal, Queretaro, Mexico. 4 $2 65
15 Agate. 1 $1
16 Agate, Brazil. 1 75c.
17 Agate, Brazil. 1 $1
18 Amazon stone, Pikes Peak, Col. 1 $1
19 Obsidian, Mexico. H.N.Rust. 1 $1¼
20 Quartz crystals in matrix of sandstone, Herkimer county, N.Y. 1 $1
21 Quartz crystal, same locality 1 $2
22 Ditto. 1 $1 75
23 Ditto. 1 $3
24 Ditto. 1 $1
25 Ditto. 1 $1
26 Ditto. 1 $1½
27 Ditto. 9 $6
28 Ditto. 12 $12
29 Ditto. 2 $2
30 Zoisite, Pomfret, Vt., 1877. 1
31 Flint, Chalk Cliffs, England. 1 50c.
32 Porphyry, near San Rafael, Baja Cal. 1
33 Selenite, N. S.; F. M. Goodwin. 1
34 Gold and silver ore, Calico, Cal. 1 C. C. Kent.
35 Same, with molybdenite, Jacumba valley, Cal. "$28 in silver." 1
36 Cassiterite, Temescal, Riverside county Cal., 10 mi. from Elsinore. 1
37 Tourmaline, Cantillas canon, Baja Cal. H. C. Orcutt. 1
38 Geodes (fragments), Washington county Ind. Miss A. Reid. 8
39 Amethyst, Thunder bay, Mich. R. P. Chandler, 2 $2
40 Azurite, Laurian, Greece. 1 $5
41 Millerite, Antwerp, N. Y. 1 $2
42 Byssolite, French Creek Falls, Pa. 1 $1
43 Gold ore, Sunnyside mine. 1 $3
44 Ditto. 68 specimens
45 Ditto. W. F. Hendsch. 1
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, Granby, 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.

ACMEROITE (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 Burmah and Brazil, which is mainly cut and polished in Germany.

ALMANDITE—Red garnets are not rare in the California placers, in fact 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.

CARNELIAN—A variety of quartz, translucent like horn, yellow, brown or red. Has been found on the Colorado desert and specimens collected in the Jape 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, in Temecula, Riverside county, California, and near San Diego. The near future operations may yield specimens equal to those from Durango, Mexico, which is polished as a gem.

CHALCEDONY—An uncrystalized translucent or clouded variety of quartz, white, yellow, brown or blue usually whitish, having a lustre 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; carnelian a flesh-red; sard a grayish red. Portions of the Colorado desert and San Diego county are strewn with water-worn fragments of chalcedony of differ-

ent 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.

CHRYSOPRASE—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.

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 Santo Tomas, Baja California.

GARNET—See Almandite.

HYALITE, or Muller's glass—A varfety 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 occuring 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 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.

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 occurrance 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 chalcedony pebbles abound.

SUCCINITE—"Amber in small nodules 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 somes times 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 agreable 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 achroite, 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.

(Continued from page 16.)

Genus ARISTIDA Linnaeus.

A. DISPERSA Trin.
2561 Data as above, large fls., twisted awns.
2562 Same locality, March 11.
2563 Near Calmalli, Feb. 21.
2564 Same locality, Mar. 5.
2565 Near Vulcan de las Tres Virgenes, Mar 13.

Genus BOUTELOUA Lagasca.

B. ARISTIDOIDES Thurb.
2566 Near Calmalli, not rare on dry plains. March 4.
2567 Near Mission Santa Gertrudis, Mar. 10.

Genus MUHLENBERGIA Trin.

M. DEBILIS Trin.
2568 Data as above.
2569 Same vicinity, Mr. 11.
2570 Near Calmalli, Mr. 1.
2571 Valle de las Tres Virgenes, Mr. 14.

Genus FESTUCA Linnaeus.

F. OCTOFLORA Walt. var.
2572 Near Mission Santa Gertrudis, Mr. 10.

CENCHRUS PALMERI Vasey.
2573 Near Calmalli, F. 24, not rare.

PAPPOPHORUM WRIGHTII Watson.
2574 Near Calmalli, common on rocky slope, Mr. 3.

ERAGROSTIS MAJOR Host.
2575 Valle de las Tres Virgenes, Mr. 14.

TRIODIA PULCHELLA HBK.
2576 Near Eureka mine, Calmalli, Mr. 1.

CYPERACEAE.

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 Calmalli, Mr. 10.

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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 derth of vegetation usually attributed to a desert. Absence of vegetation formerly meant lact 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. Speciments 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 gardner who disliked mixing up the varieties. Here would be as trip of some flower in white; adjoining it, perhaps a zone occupied by a delicate blue Gilia, and then a lemon colored Gilia, and next a bed of brilliant orange.

The forest-like growth of Yucca arboresceus (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 ths solitude of the coyote and the rattlesnake.

Dr. Asa Gray once sad 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 beconsidered 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 Calmalli.

The fruit is sweet and edible, I believe, like that of Yucca mojavensis, 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 simillima 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 practicaly 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 courted 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 spadicea, 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 Caeser 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 cirio. It was first described by Dr. Kellogg under the name of Idria columnaria, but was later recognized as a species of Fouquiera, and so appears in later works as F. columnaris. 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 Fouquiera 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 sometimes 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 pitalla dulce for its delicious fruit, as well as the yet more luscious pitalla agria (Cereus gummosus) also abundant here, and the barrel cactus (Echino-cactus peninsulae), 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.

Pedilanthus 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. Viguiera geniculata 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 laurite 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 56,000 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 copper 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 25 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 reduces 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 Curacca on a holiday Sunday, which landed me Monday morning in Guaymas harbor, where I was once more in touch by wire and mail with the rest of the world.

C. R. ORCUTT.

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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. I's 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 irridescence; 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 irridescence 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 7½ 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 of "pearl," 100 mm., rough; interior dull mottled greenish brown and bluish irridescence. 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. Tney 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 California, strangely enough they seem to be absent from the waters of the Gulf of California, where thrives the pearl oyster shell.

C. R. ORCUTT.

Clausilia jan Boett
sieboldti
Alycaeus inpiotensis
Bulimus rheitimus Kob
Coelopoma japonicum Ad
Diplommatina japonica

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BOIS D'ARC.

Maclura aurantiaca Nutt. Gen. Am. 2:234

The osage orange or Bois d' arc (bow wood, so call 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."

The fruit is about the size of a large orange, has a tuberculated surface of a golden color, and is filled internally with radiating somewhat woody fibres, and with a yellow milky juice, the odor of which is generally disliked, so that the fruit, although wholesome, is seldom eaten.

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West American Scientist

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

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

Don, Mill. iii. 160.
Dietr. Syn. Pl. iii. 94. 1843.
Coulter, l.c. ii. 127.
Watson, Bibliographical Index, 403.
Cactus missouriensis Kuntze, l.c. 259; Coulter l.c. iii. 110.
C. mamillaris Nuttall, Gen. i. 295—non Linn.—1818
James, Long's Exped. London ed. ii. 140.
Torrey, Ann. Lyc. N. Y. ii. 202.
Eaton & Wright, Botany North America, ed.8, 163.
M. simplex Torrey & Gray, Fl. i. 553.
M. notesteinii Britton, Bull. Torrey Club, xviii. 367. 1891.
M. caespitosa Gray, Struct. Bot. 421, fig. 838.

M. Nuttallii Engelmann, in Gray, Pl. Fendl. (Mem. Am. Acad. iv. 49):—"Simplex (an semper?), globosa, axillis tuberculorum ovato-cylindricorum supra leviter sulcatorum subtomentosis; areolis junioribus albo-tomentosis; aculeis rectis albidis, radialibus 13–16 subinæqualibus setaceis, centrali porrecto robustiore; floribus ex axillis tuberculorum hornotinorum 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 mammillaris, Nutt., non Linn.—On high, dry prairies, about Fort Pierre, on the Upper Missouri; flowering in May.—My specimen is 1½′ 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 ½–¾″ 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. 1880.

M. NOTESTEINII Britton.

Original description:—"Stems oval, simple or cæspitose, about 3 cm. in diameter. Tubercles nearly terete and about 6 mm. high; spines 12–18, white, becoming gray with age, weak and slender, 8–12 mm. long, spreading, pubescent throughout. Usually each tubercle bears a central spine which is longer and stouter than the others, and is frequently tipped with pink; fl. 15–25 mm. in diameter, ash-gray, tinged and pencilled with a delicate pink. Petals broadly linear-oblong, mucronate-tipped; fr. obovoid; seeds black, globose, pitted. Found in gravelly soil, near a small creek, in the vicinity of Deer Lodge, Montana, by Prof. F. N. Notestein, June 4th, 1891."—Britton, Bull. Torrey Club, xviii. 367. D. 1891.

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

=missouriensis.

M. PECTINATA Engelmann.

Original description:—"simplex, globosa; tuberculis conicis abbreviatis, summis floriferis teretibus longioribus sulcatis; areolis oblongis; aculeis 16–24 rigidis recurvis intertextis subæqualibus s. in tuberculis summis superioribus longioribus fasciculatis omnibus radiantibus corneis s. albidis; floribus magnis sulphureis. On the Pecos river, in western Texas: fl. July. Plant 1–2′ in diameter. Lower tubercles 2–3, floriferous ones 5–6″ long; spines 3–5, upper fasciculated ones 6–9″ long. Flower 2½–3′ in diameter; seed 0.9″ long."—Engelm. Proc. Am. Acad. iii. 266.

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

Walp. Ann. v. 36.

Watson, Bibliographical Index, 403.

Coulter l.c. ii. 128.

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

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

Cactus pectinatus Kuntze l.c. 259.

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

M. PHELLOSPERMA Engelmann.

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

Engelmann, Cact. MexicanB. 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. 366.
Walpers, Ann. v. 34. 1858.
Watson, Bibliographical Index, 403.
Foerster, 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 ntgris hilo spongioso fusco auctis. From San Diego to the junction of the Gila with the Colorado.—M. Goodrichii, Sbheer, 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 supernе 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.
Foerst. 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 ovatis axilla longelanatis; aculeis pluri-seriatis, extimis 30–50 capillaceis crispatis, interioribus 10–12 rigidioribus brevioribus albidis, intimis 5–8 longioribus rigidis rectis versus apicem 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.—Forms scarcely distinct from the well-known West Indian M. pusilla."—Engelm. Proc. Am. Acad. iii. 261. 1856.

M. RADIANS DC.

Original description:—"simplex, subglobosa, axillis nudis, mammis valde magnis, areola glabriuscula, aculeis 16–18 radiantibus albidis rigidis, superioribus subtomentosis, centrallibus nullis. Mexico. Coulter, No. 35. Varietat apice obtuso aut subdepresso, aculeis albidis aut subflavidis. Pl. globiter 3 poll. alt. et diam.; aculei 5–6 lin. longi."—DC. in Mem. Mus. Par. xvii. 111. 1828.

P. 384.

Cactus radians Kuntze, l. c. 261.

Coulter l. c. iii. 113.

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

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

M. RECURVATA Engelm.

Original description [sub recurvispina]:—"simplex, depresso-globosa, tuberculis ovatis profunde suleatis confertis; areolis obliquis ovatis, aculeis radialibus 12–20 rigidis recurvis intertextis albidis corneisve, aculeo centrali singulo (raro binis) robustiore longiore decurvato; floribus flavicanthis 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 M. recurvata Salm, I now name the Arizona M. recurvata. M. recurva Lehm. is a form of M. pucracantha fide Salm."—Engelm. Trans. Acad. Sci. St. Louis. ii. 206.

Watson, Bib. Index. 409. 1878.

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

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

M. recurvispina Engelm. Proc. Am. Acad. iii. 266. 1856. (now Vriese)—Cact. Mex. Bound. 12.

P. 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 saepe curvatis, superioribus rectis fasciculatis paullo tenuioribus, centrali singulo valido compresso recurvato, omnibus subpollicaribus corneis apice atratis; floribus luteis ex axillis junioribus tomentosissimis; seminibus magnis obovatis fuscis lævibus. Sonora, on grassy prairies: fl. July. Tubercles nearly an inch long, characterized by a very slender, constricted tube, very different from the wide tube of [M. scheerii valida]. Seeds fully 1½ 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. 205. 1856.

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

M. SALM-DYCKIANA SCHEER.

Original description:—"Infeleciter periit hæc insignis species a Dom. Potts, prope Chihuahua, cum praecedente 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 subaequalibus 8–10 radianter patentibus, centralique solitario erecto validissimis rigidissimis basi noduloso-incrassatis griseo-fulvidis aut brunneis, cum adventitiis summis gracilioribus 1–5."—Salm-Dyck, A G Z. 1850. 394.

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

VAR. BRUNNEA Salm-Dyck.

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

M. Scheeri 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 bilobа, sulco pubescente, uno vel pluribus glandulis munito: aculeis validis, e mamillarum apice nascentibus, citrinis vel saepe albescentibus, deinde luteis vel rubris, brunneo-vel nigro-sphacelatis; exterioribus 8 parum reflexis, centrali uno longissimo robustissimo rector mamillarum longitudo 14–16 lin.: latitudo 6–7 lin.; aculei longitude 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 Tourney. 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 Allgeimeine Gartenzeitung (1845, 346; 1846, 373 = M. polymorpha Scheer, = M. conoidea fide Index Kewensis). The rule "once a synonym always a synonymn" 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, l.c. 261. 1891.

Coulter, l.c. iii. 111. 1894.

Cactus Brownii, Tourney, 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 v. 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 Mamillariæ, 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. scheeri from Chihuahua, according to Prince Salm's description, is a smaller plant, with single central spines one inch in length, and much shorter radial spines; the areolæ 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 sul sulcatis, adscendentibus inf ricatis; 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. 41

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, 10. (not Scheer 1850), and M. echinata Engelm. (Cactus calcaratus Kuntze, l.c. 259),—see p. 61.

M. STROBILIFORMIS

Original description:—"simplex ovato-conica, tuberculis imbricato-appressis, ovatis, applanatis, sulcatis; aculeis rectis radialibus, sub-10 albis, 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. Inhabits rocks; flowers in June. About 3 inches high, and 2 inches in diameter below; tubercles in 12 to 13 oblique rows closely appressed, 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. 86. 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 Muhlpfdt. see p. 61.
M. tetramerista Engl. = Graham and phellosperma (see Lutet.

MAMMILLARIA TEXENSIS Lab.

"Tige de forme globuleuse, á sommet ombiliqué: aisselles nues: mamelons tres-longs, legerement tetragones, á arétes émoussées, arrondies, sommet tronqué et base tout á fait rhombique, d'abord comprimés et plus épais que larges, puis plus tard déprimés, plus larges qu'épais: les jeunes, manifestment adhereénts les uns aux autres par la base prés du point de leur insertion sur la tige, sont disposés par séries spirales subverticales: aréoles apicillaires, rondes, garniesde tomentum blanc abondant d'abord, caduque par la suite; 18 aiguillons extérieurs greles, rayonnant tres-régulierement blancs, les supérieurs moins longs, les inferieurs un peu plus: en outre, 1 aiguillon intérieur central dressé, blanc, plus court, plus vigoureux que les autres, á pointe brune. Les mamelons atteignent 1 cent. de longueur environ, ils sont greles et d'un beau vert-glauque: les aiguillons des jeunes aréoles sont d'abord peu divergents, subfasciculés, avec l'age ils deviennent de plus en plus divergents, puis enfin tout á 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 prolifera; tuberculis e basi rhomboidea ovatis abbreviatis obtusis profunde sulcatis demum suberosis persistentibus confertis, axillis villosissimis; aculeis exterioribus 20–30 ridiis albidis, interioribus 5–9 robustioribus cæsiopurpureis sphacelatis, superioribus longioribus erectis, infimo breviore robusto porrecto s. deflexo; floribus in vertice densissime tomentoso centralibus pollicaribus dilute roseis; baccis 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. t. 12. f. 1–16.

Walp. Ann. v. 37.

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California Pearl Shells.
The Desert.
The Metric System. Geo. S. Hodgins.

THE BLUE COPPER GROUP OF CLAIMS.

This group is situated in the base of the north slope of the San Bernardino 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 600 yards of the claims, and an expenditure of $50 would complete a good road to a point 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 750 ft. from the mouth of the tunnel, the tunnel would be 200 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. farther 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 lodge yielded 17 per cent. copper, considerable silver and some gold. An assay of average ores taken from the mines, returned 6½ per cent. copper, 6 oz. silver, and ½ oz. gold.

Malcom Matheson.

These claims for sale—write to

ORCUTT, San Diego, California.

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?

West American Scientist

Volume XI. No. 4. May, 1900. Whole No. 89.

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 waysi le. 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 Buchan, 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 4½, the first 1½ smooth, the following regularly costulate striate, the costulæ separated by spaces wider than themselves; last whorl abruptly turning forward, rounded beneath, encircled by a slight central constriction or furrow; aperture about ⅓ 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 lamellæ, 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 lamellæ. Altitude 1.7, diameter .8 mm. Near the mouth of the Santo Tomas river, Lower California, collected by Henry 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 imbeded 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 fasiole, 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 aperature 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 Ocinebra 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 2½ 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; aperature 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 $\frac{1}{3}$ of the body like an umbrella. Mouth proboscidiform, 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, $\frac{1}{4}$ inch long; mantle with 5–10 or more circles of dark brown irregularly placed along the edge of the thick mantle.'—Oreutt, 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 linate inside. Longitude of shell, 14: of aperature, 7.5: 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 208 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 costulæ, 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 aperature, without crest or scrobiculation behind the peristome; aperature 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 Roccella 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 microscopical 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.

EPIPHRAGMOPHORA 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 visable 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 Jl 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 striæ; 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. O '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 4⅓ 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 ¾ 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.

§ As'eronotus. Brilliant red, with few large black spots irregularly distributed, surface smooth; dorsal tentacles short, branchiae composed of 8 simply pinnate rays, expanding close to the posterior end of the body. Length ½, breadth ¼ 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 hav- the black spots very small. Tentacles acute, cylindric-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 ½ 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 scolloped 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 3½, breadth ¾ 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-branchata, resembling Aplysia more nearly than any other, and probably carnivorous or a carrion eater.'—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, spathulate 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. e l 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.

Am economist, 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 article 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, †81.
——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.
Millspaugh, 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. Ca aes 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 Janira ——? East side of Chollas valley, d* J. H. Orcutt. 1 upper valve. Sept. 23, 1888.

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d* indicates "San Diego, California."
Orcutt 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 biplicata.
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 Surenka carpenteriana 3
57 Macron kellettii 4
58 Nassa californica 25
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—Oct 1888. 5
64 Area? 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 Latricola 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 aequisulcatus Conr. d from Daniel Cleveland.
74 —— Nos. 74–78 from Cholias valley. d
75 Echinarachnius excentricus? 4
76 Neverita reclusiana Petit. 2
77 Ceritlidea sacrata Gld. 2
78 Solecurtus californianus Conr.
79 Favosites hamiltonensis? Iowa City, Iowa, collected by J. W. Preston: a beautiful fossil coral (polished).
80 Chione simillima Sby. 13th and H sts., d Oct 2
81 ——succincta Val. With No. 80.
82 Anomia lampe Gray. Same data.
83 Ostrea Inrida Cpr.

84 Petrified moss, Black Hills, Dakota, from L. W. Stilwell.
85 Desinia ponderosa. Railroad lands, d Or 1881
86 Verpetus arenarius L. Pliocene, Sienna, Italy. S. Brogi.
87 Balanus estrellanus Comr, 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 Rope, mesa d Mrs. Z. R. Crouyn.
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 Algæ. Ill
96 Pebble, containing fossils, Lake Michigan. Miss L. P. Gray.
97 Lithostrotion proliferum Ill.
98 Coral, Washington county, Ind. Miss Adelaid Reid.
99 Petrified moss, Spring Arbor, Mich. Miss Lydia P. Gray.
100 Trilobite, Jersey county. Ill. "
101 Dentalium apyrgum Gmel. Pliocene, Jonese. S. Brogi.
102 Turritella subangulata Brac. " " "
103 Natica millepunctata L. " Siena Italy "
104 Fusulina——? Ill.
105 Chiuan incrusted with algæ, Pt. Loma, d Or 1879.
106 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. 3
109 " ——? do 3
110 Pecten æquifulcatus? 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 Desinia ponderosa d Or 3
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 Oncibulum 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 altimately 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.

ATTORNEYS.

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callizona Crosse
trochula Ad
quaesita Desh
blukeana Newc 25c
laeta Gld
hirasei Gude
mercatoria Gray
connivens
elegantissima Rve
despecta Gray
Clausilia jan Boett
sieboldti
Alycaeus inphonensis
Bulimus rheitianus Kab
Coelopoma japonicum Ad
Diplommatina japonica

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

THE

West American Scientist

CONTENTS.

WEST AMERICAN SCIENTIST: 305 Twenty-first St., San Diego, Calif.

Established 1884 by Charles Russell Orcutt, Editor and Publisher. Price 10 cents a copy, $1.00 a year (twelve consecutive numbers), $10.00 for life. Back numbers (when available) 20 cents a copy; numbers 1-12, 20-33, 66, and others, wanted.

SANITARIAN, THE: 337 Clinton St., Brooklyn, N. Y.

A monthly magazine, established in 1873, based at the outset upon medical knowledge and sanitary service, over an extensive field of observation in various climates, large experience in dealing with epidemic diseases, and practical sanitation for the maintainance of health under the most trying circumstances. Two volumes a year: $4 in advance, 35c a number (sample copy 20c.—10 2c stamps). Dr. A. N. Bell, editor.

WANTS.

Brief notices inserted free for subscribers.

FRUHSTORFER, H.: Thurm-Strasse 37. Berlin. N. W., Germany.

Old American stamps or postal cards wanted for illustrated price list of tropical butterflies. North American Rhopalocera, Papilionidae, Pieridae, Parnassus, and Lycaenidae wanted for nice sheets. Papilionidae from Java. Butterflies, beetles, and other insects in perfect condition, carefully named, for sale cheap.

MITCHELL, EDW. C.: 534 Summit Ave., St. Paul, Minn.

Wishes to buy any genuine ancient American copper relics; any extra large stone spears; or any pre-historic relics originally found in Minnesota.

PRESTON, I. W.: Baxter, Iowa.

Eggs for Eggs.

THE

West American Scientist

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

WEST AMERICAN MOLLUSCA,

OCINEBRA GRACILLIMA.

"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 antumbonal 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. f6, 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 Atteu, 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 kind-

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 ¾ 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, inhabitating the same region."--Robert E. C. Stearns, Annals N Y ac 1:--(N 1879), 3 i.

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:—ti, 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 pro'onged, 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:—t1, 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 b'ack, 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 disp'aying 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 nodu'es; 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, Concho'ogical 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 tudiculata 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 Jl 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. Blaisdell 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.
Ficana apicalis Dallas.
Melanocoryphus bicrucis Say.
Oncopeltus fasciatus Dallas.
Lopidia nigridia Uhler.
Sinea spinipes Herrick Schaefer.
Zaitha 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.
Stenopelmatus fasciatus Thomas.

COLEOPTERA.

Cicindela vulgaris Say. Cq.
Cicindela hirticollis Say. Cq.
Cicindela tortusosa Dejean. Cq.
Cychrus interruptus Menetries. Cq.
Scarites subterraneus Fabricus. Cq.
Brachynus fidelis Leconte.
Galerita lecontei Dejean. Cq.
Pinacodera 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.
Phalacrus penicillatus Say.
Hippodamia convergens Guerin.

Anisosticta seriata Melsheimer. Bl.
Chilocorus cacti L. Bl.
Dryops productus Leconte.
Dryops suturalis Leconte.
Saprinus pacminosus Leconte.
Saprinus lubricus Leconte.
Diplotaxis subangulata Leconte.
Phobetus comatus Leconte. Hy.
Ligyrus 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 Lecconte.
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 actuosa Horn.
Asida carinata Leconte.
Asida obsoleta Leconte.
Asida angulata Leconte.
Also another, probably new, species of this genus.
Eusattus 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.
Cynaeus 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 pub'ished 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

—Four new Coccidae from Arizona. Can ent, 1900, 129-132. 10c.

—Tables for the determination of New Mexico bees. B Un N M 1: 41-73. $1.

—et Henry A. Pilsbry: Ashmunella, a new genus of Helices. Phila ac pr 1899. 188-194, f. 25c

—Notes on some southwestern plants. Torr bot cl b 27: 87-89 (F 1900). 10c.

—Some notes on the entomology of Prunus. N M aes b 27, 132-134. 25c.

—Report of the entomologist.—Part 1. N M aes b 19. 25c.

STEARNS, ROBERT EDWARDS CARTER:

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

—Description of a new species or variety of land snail from California. N Y ac annals 1:—3 f (N 1879). 30c.

—On Helix aspersa in California and the geographical distribution of certain West American land-snails, &c. N Y ac annals 2: 129-139. 40c.

BOOK DEPARTMENT.

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.
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